

APRICUM

MULTI-IO 12

APPLICATION PROGRAM DESCRIPTION

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0 VERSION HISTORY

Version	Date	Comments
1.0	November 2011	First official issue
1.1	January 2012	Correction (Power down) in “Block diagram”, Chapter 3.2.1.

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2 FUNCTIONAL DESCRIPTION

The Multi Input/Output 12 (MIO-KNX 12) is a modular installation device for installing in a distribution board on 35 mm mounting rails. It integrates a 12 fold binary input as sensors and a 12 fold binary output as actuator in one housing.

Connection to the EIB / KNX is implemented via a 2 screw terminal.

The actuators switch up to 12 independent electrical loads via potential free contacts (bistable relays). The outputs are connected using screw terminals.

Each output is controlled separately via the EIB / KNX.

The actuators are particularly suitable for switching ohmic loads.

The 12-fold Binary Input part has 12 independent inputs for sensing potential free floating contacts such as conventional switches and push buttons.

The device provides a scanning voltage with a pulse (peak voltage 18 V).

The internal supply is carried out via externally connected 230V.



2.1 TECHNICAL CAPABILITIES

After connecting the MIO-KNX12 to the bus the behaviour of every input and output can be set with the help of the ETS3/ETS4. A button connected to an input of the MIO-KNX12 can not only switch the respective output of the MIO-KNX12, but via the bus it can also be used for the switching of the outputs of other actuators.

Inputs and outputs can be used completely independently (uncoupled) from each other.

A very special and convenient characteristic of the MIO-KNX12 is that inputs and outputs can also be coupled in two times 6 or all 12 together. Further to this inputs and outputs can be used a half coupled and a half uncoupled.

Every input can be parameterised and used as with a binary input device, and every output can be used and parameterised as with a switching actuator.

3 OVERVIEW

3.1 INPUTS

Inputs may have the following functions (or may be “not active”):

- Sun protection
- One-Button Shutter
- Dimming (or One-Button)
- Switch (Switch short/long)
- Send Value (Percent)
- Send Value (Angle)
- Send Value (Temperature)
- Send Value (Forced)
- Send Value (8-bit)
- Send Value (16-bit)
- Counter Reset
- Blinds
- Counter Threshold
- 1-Bit Scene
- Scene
- Counter
- Interlock

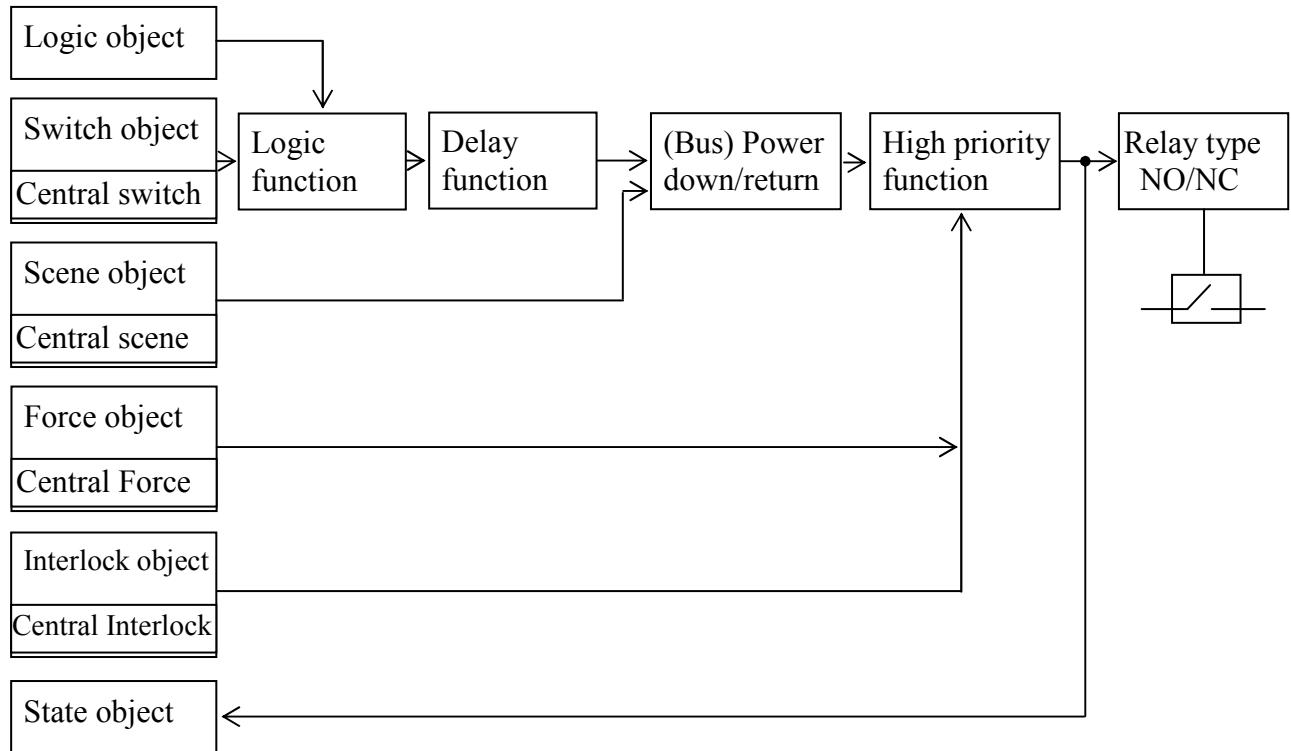
3.2 OUTPUTS

Outputs may have the following functions (or may be “not active”):

- Switch
- Staircase
- Block
- Forced
- Scene
- State
- Logic
- Operating counter
- Switching counter
- Operating counter limit reached
- Switching counter limit reached
- Reset counter


3.2.1 BLOCK DIAGRAM

Following functions and their control are possible over the bus:



3.2.2 FUNCTIONS PRIORITIES

Regarding the switching behaviour of the actuator each function has a certain priority. The weighting of the functions can be taken from the following table:

Priority	Function
Highest Priority	Priority function
	Behaviour after bus voltage failure
	Logic function
	Behaviour after bus return
Lowest Priority	Switching, time, central and scene functions

4 COMMUNICATION OBJECTS

NOTE

All communication objects are depending on the respective parameters set in the ETS.

4.1 LIST

Nr.	Name	Function	DPT	Length	Default Flags					Priority	
0	Output A	Switch on/off	DPT 1.001	1 bit	C	0	W	0	0	0	Low
1	Output A	Block	DPT 1.001	1 bit	C	0	W	T	U	0	Low
1	Output A	Forced	DPT 2.001	2 bit	C	0	W	T	U	0	Low
2	Output A	Scene	DPT 18.001	1 byte	C	0	W	0	0	0	Low
3	Output A	State	DPT 1.001	1 bit	C	R	0	T	0	0	Low
3	Output A	State	DPT 1.001	1 bit	C	R	0	T	0	0	Low
4	Output A	Logic 1	DPT 1.001	1 bit	C	0	W	T	U	0	Low
5	Output A	Logic 2	DPT 1.001	1 bit	C	0	W	T	U	0	Low
6	Output A	Operating counter	DPT 7.001	2 byte	C	R	0	T	0	0	Low
6	Output A	Operating counter	DPT 12.001	4 byte	C	R	0	T	0	0	Low
7	Output A	Switching counter	DPT 7.001	2 byte	C	R	0	T	0	0	Low
7	Output A	Switching counter	DPT 12.001	4 byte	C	R	0	T	0	0	Low
8	Output A	Operating counter limit reached	DPT 1.001	1 bit	C	R	0	T	0	0	Low
9	Output A	Switching counter limit reached	DPT 1.001	1 bit	C	R	0	T	0	0	Low
10	Output A	Reset counter	DPT 1.001	1 bit	C	0	W	0	0	0	Low
"+13...	Output B-L	Further Outputs									
156	Input A/B	Sun protection up/down	DPT 1.009	1 bit	C	R	0	T	0	0	Low
156	Input A/B	Dimming on/off	DPT 1.001	1 bit	C	R	0	T	0	0	Low
156	Input A	Switch	DPT 1.001	1 bit	C	R	0	T	0	0	Low
156	Input A	Sun protection up/down	DPT 1.009	1 bit	C	R	0	T	0	0	Low
156	Input A	Dimming on/off	DPT 1.001	1 bit	C	R	0	T	0	0	Low
156	Input A	Send Value (Percent)	DPT 5.004	1 byte	C	R	0	T	0	0	Low
156	Input A	Send Value (Angle)	DPT 5.003	1 byte	C	R	0	T	0	0	Low
156	Input A	Send Value (Temperature)	DPT 9.001	2 byte	C	R	0	T	0	0	Low
156	Input A	Send Value (Forced)	DPT 2.001	2 bit	C	R	0	T	0	0	Low
156	Input A	Send Value (8-bit)	DPT 5.010	1 byte	C	R	0	T	0	0	Low
156	Input A	Send Value (16-bit)	DPT 7.001	2 byte	C	R	0	T	0	0	Low
156	Input A	Counter Reset	DPT 1.015	1 bit	C	0	W	0	U	0	Low
157	Input A/B	Blinds on/off	DPT 1.009	1 bit	C	R	0	T	0	0	Low
157	Input A/B	Dimming	DPT 3.007	4 bit	C	R	0	T	0	0	Low
157	Input A	Blinds on/off	DPT 1.009	1 bit	C	R	0	T	0	0	Low
157	Input A	Dimming	DPT 3.007	4 bit	C	R	0	T	0	0	Low
157	Input A	Counter Threshold	DPT 1.001	1 bit	C	R	0	T	U	0	Low
158	Input A	1-Bit Scene	DPT 1.022	1 bit	C	R	0	T	0	0	Low
158	Input A	Scene	DPT 18.001	1 byte	C	R	0	T	0	0	Low
159	Input A	Counter	DPT 5.010	1 byte	C	R	W	T	0	0	Low
159	Input A	Counter	DPT 7.001	2 byte	C	R	W	T	0	0	Low
159	Input A	Counter	DPT 12.001	4 byte	C	R	W	T	0	0	Low
160	Input A	Interlock	DPT 1.001	1 bit	C	0	W	T	U	0	Low
"+5...	Input B-L	Further Inputs									
228	Central output function	Switch on/off	DPT 1.001	1 bit	C	0	W	0	0	0	Low
229	Central output function	Scene	DPT 18.001	1 byte	C	0	W	0	0	0	Low
230	Central output function	Forced	DPT 2.001	2 bit	C	0	W	0	0	0	Low
231	Central output function	Interlock	DPT 1.001	1 bit	C	0	W	0	0	0	Low
232	Central input function	Interlock	DPT 1.001	1 bit	C	0	W	0	0	0	Low
233	Central function	Heartbeat	DPT 1.001	1 bit	C	R	0	T	0	0	Low

4.2 DETAILS

4.2.1 CENTRAL FUNCTIONS

NOTE

Each Central function has to be enabled in the respective channel.

Obj-nr	Object name	Function	Type	Flag
228	Central output function	Switch On/Off	1 bit	CW
Via this object the telegrams will be received to switch the load connected to the output.				
229	Central output function	Scene	1 byte	CW
Via this object the telegrams will be received to recall /store scenes.				
230	Central output function	Forced	2 bit	CW
Via this object the telegrams will be received to force the load connected to all outputs to a predetermined state. This object has the highest priority function, more than the object "Block".				
231	Central output function	Interlock	1 bit	CW
This object is used to block all outputs with a predefined value. Two possible interlock values: 0 or 1.				
232	Central input function	Interlock	1 bit	CW
This object is used to block all inputs with a predefined value. Two possible interlock values: 0 or 1.				
233	Central function	Heartbeat	1 bit	CRT
This object is used to generate a heartbeat signal with a predefined cyclic sending.				

4.2.2 INPUTS

Obj-nr	Object name	Function	Type	Flag
156	Input A/B, Sun protection up/down	Shutter	1 bit	CRT
This object is used to move the sun protection up or down (if two inputs used).				
157	Input A/B, Blinds on/off	Shutter	1 bit	CRT
This object is used to close or open the blinds (if two inputs used).				
157	Input A, Blinds on/off	Shutter	1 bit	CRT
This object is used to send a telegram to close or open the blinds (if only one input used).				
156	Input A, Sun protection up/down	Shutter	1 bit	CRT
This object is used to move the sun protection up or down and to close or open the blinds (if only one input used).				
156	Input A/B, Dimming on/off	Dimming on/off	1 bit	CRT
This object is used to switch on/off a diming light (if two inputs used).				
157	Input A/B, Dimming	Dimming	4 bit	CRT
This object is used to dim brighter or darker (if two inputs used).				
156	Input A, Dimming on/off	Dimming on/off	1 bit	CRT
This object is used to dim brighter or darker a light (if only one input used).				
157	Input A, Dimming	Dimming	4 bit	CRT
This object is used to dim brighter or darker a light (if only one input used).				

156	Input A, Switch	Switch	1 bit	CRT
This object is used to switch “on”, “off”, “toggle” or “Status send”.				
156	Input A, Send Value (Percent)	Value send	1 byte	CRT
This object is used to send a value predefined in Percent. Sent after a rising edge, on both edges, on short/long, on long of the signal state at the input.				
156	Input A, Send Value (Angle)	Value send	1 byte	CRT
This object is used to send a value predefined as an Angle. Sent after a rising edge, on both edges, on short/long, on long of the signal state at the input.				
156	Input A, Send Value (Temperature)	Value send	2 byte	CRT
This object is used to send a value predefined as a Temperature. Sent after a rising edge, on both edges, on short/long, on long of the signal state at the input.				
156	Input A, Send Value (Forced operation)	Forced value send	2 bit	CRT
This object is used to send a predefined forced operation value. Sent after a rising edge, on both edges, on short/long, on long of the signal state at the input.				
156	Input A, Send Value (8-bit)	Value send	1 byte	CRT
This object is used to send a predefined 8-bit value. Sent after a rising edge, on both edges, on short/long, on long of the signal state at the input.				
156	Input A, Send Value (16-bit)	Value send	2 byte	CRT
This object is used to send a predefined 16-bit value. Sent after a rising edge, on both edges, on short/long, on long of the signal state at the input.				
156	Input A, Counter Reset	Counter Reset	1 bit	CWU
This object is used to reset the counter if defined.				
157	Input A, Counter Threshold		1 bit	CRTU
This object is used to set a limit/threshold to a defined counter.				
159	Input A, Counter	1 byte Counter	1 byte	CRWT
This object is used as a counter with one byte length. Counting on rising, falling or both edges.				
159	Input A, Counter	2 byte Counter	2 byte	CRWT
This object is used as a counter with two byte length. Counting on rising, falling or both edges.				
159	Input A, Counter	4 byte Counter	4 byte	CRWT
This object is used as a counter with four byte length. Counting on rising, falling or both edges.				
158	Input A, 1-Bit Scene	Scene (1 and 2)	1 bit	CRT
This object is used to recall or learn the output state related to encoded scene number.				
158	Input A, Scene	8-bit Scene (1 to 64)	1 byte	CRT
This object is used to recall or learn the output state related to encoded scene number.				
160	Input A, Interlock	Interlock	1 bit	CWTU
This object is used to block with a predefined value. Two possible interlock values: 0 or 1.				
For input B “object number +6” For input C “object number +12”				

4.2.3 OUTPUTS

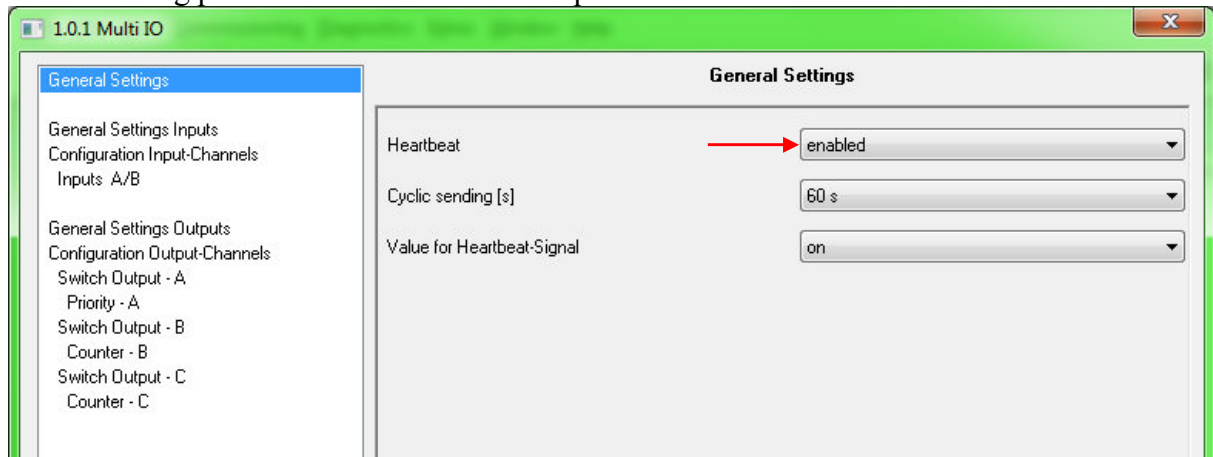
Obj-nr	Object name	Function	Type	Default Flag
0	Output A, Switch	Switch On/Off	1 bit	CW
This object is used to switch the load connected to output A to “on” or “off”.				
1	Output A, Block	Block	1 bit	CWTU
This object is used to block the load connected to output A on the parameterised state. This object has a high priority function.				
1	Output A, Forced	Forced	2 bit	CWTU
This object is used to force the load connected to output A to a predetermined state. This object has the highest priority function.				
2	Output A, Scene	8-bit Scene	1 byte	CW
This object is used to recall /store scenes.				
3	Output A, State	switching status on/off	1 bit	CRT
This object is used for sending the current switching status of output A after a change. The current switching status of the output is stored in the status object and can be queried via a read request or sent automatically after every object value change if parameterized accordingly.				
4	Output A, Logic 1	AND/OR	1 bit	CWTU
This object is used to receive the switching information for the 1st input of an AND or OR logic operation for the respective output.				
5	Output A, Logic 2	AND/OR	1 bit	CWTU
This object is used to receive the switching information for the 2nd input of an AND or OR logic operation for the respective output.				
6	Output A, Operating counter	Operating counter 2B	2 byte	CRT
This object is used to count a unit (hours, minutes....). Two bytes length. Can also be used combined with the Switching counter.				
6	Output A, Operating counter	Operating counter 4B	4 byte	CRT
This object is used to count a unit (hours, minutes....). Four bytes length. Can also be used combined with the Switching counter.				
7	Output A, Switching counter	Switching counter 2B	2 byte	CRT
This object is used to count the switching times. Two bytes length. Can also be used combined with the Operating counter.				
7	Output A, Switching counter	Switching counter 4B	4 byte	CRT
This object is used to count the switching times. Four bytes length. Can also be used combined with the Operating counter.				
8	Output A, Operating counter limit reached	Operating counter limit reached	1 bit	CRT
This object is used to evaluate if the operating counter reached the predefined limit.				
9	Output A, Switching counter limit reached	Switching counter limit reached	1 bit	CRT
This object is used to evaluate if the switching counter reached the predefined limit.				
10	Output A, Reset counter	Reset counter	1 bit	CW
This object is used to reset all counters.				
For output B “object number +13”				
For output C “object number +26”.....				

5 ETS-PARAMETERS

5.1 GENERAL

5.1.1 GENERAL SETTINGS

The following parameter “Heartbeat” is unique:



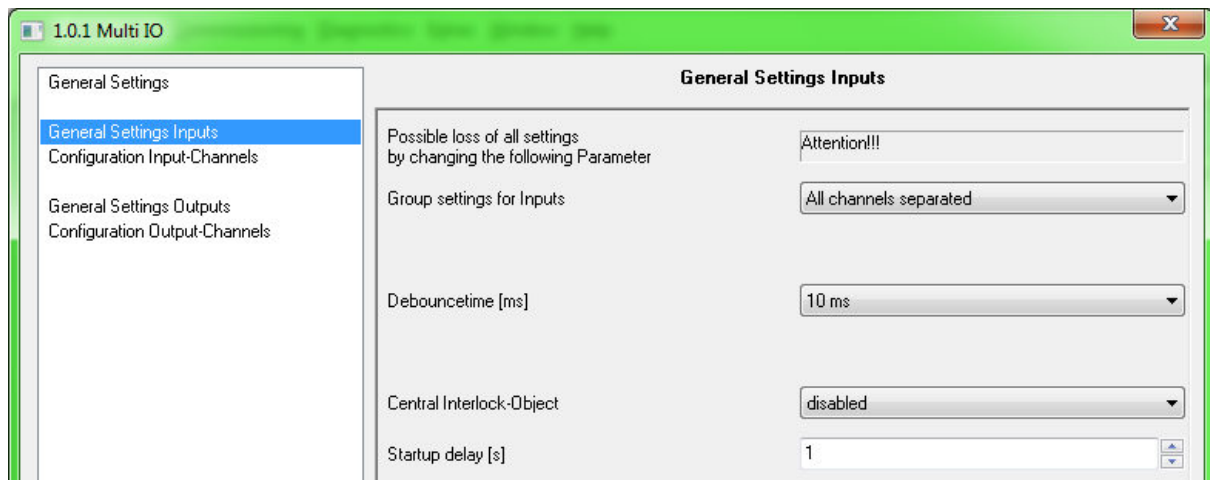
Picture 1: General Settings

ETS-Text	Range [Default value]	Comment
Heartbeat	Enabled [Disabled]	If enabled, a heartbeat-signal will be generated.
Cyclic sending [s]	1, 3, 5, 10, 15, 20, 30, 45, 60 sec 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 30, 45, 60, 120 min [60 s]	Defines the cycle-time for the heartbeat-signal.
Value for Heartbeat-Signal	off on [off]	Value which will be sent with the heartbeat signal.

Table 1: Parameter General Settings

5.2 SETTINGS INPUTS

5.2.1 GENERAL SETTINGS INPUTS

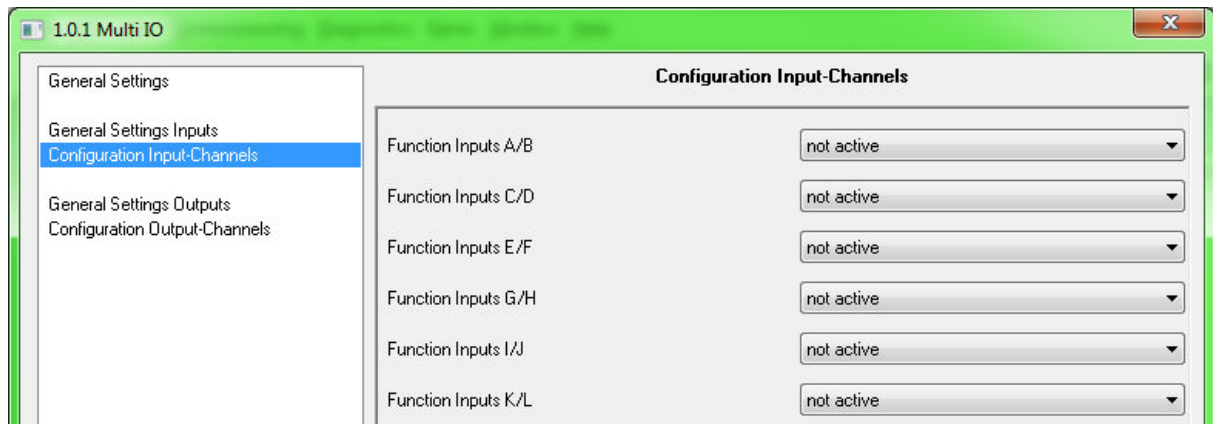


Picture 2: General Settings Inputs

ETS-Text	Range [Default value]	Comment
Group settings for Inputs	All channels separated A-L together A-F together / G-L separated A-F separated / G-L together A-F together / G-L together [All channels separated]	Depending on how the channels are going to be used, it is to be defined here if "separated" or "together". WARNING By changing this parameter all settings could be lost!
Debounce time [ms]	10, 30, 60, 120 ms [10]	Debouncing prevents unwanted multiple operation of the input e.g. due to bouncing of the contact. This time is equal to all inputs.
Central Interlock-Object	Enabled Disabled [Disabled]	Enable, if the Central-Interlock-object should be displayed.
Startup delay [s]	0 -60 sec (1, 2, 3.... 60) [1 s]	Time from bus power-up to handling of the inputs.

Table 2: Parameter General Settings

5.2.2 CONFIGURATION INPUTS



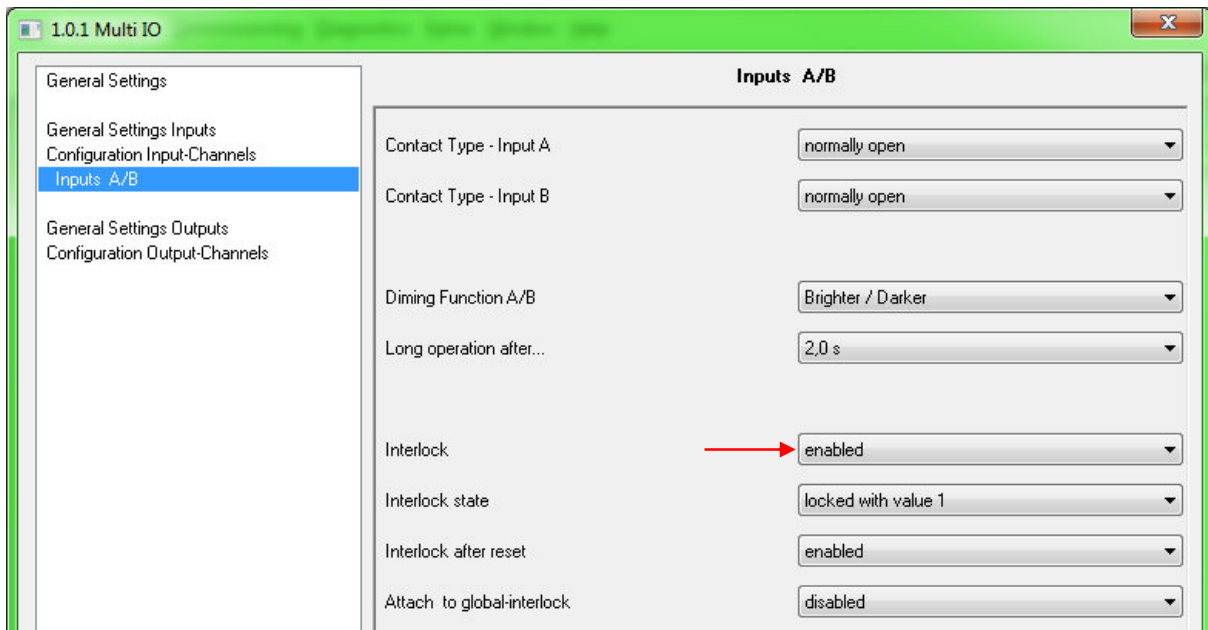
Picture 3: Configuration Inputs

ETS-Text	Range [Default value]	Comment
Function Inputs A/B	Not active Single Channels Dimming Shutter [inactive]	According to parameter group setting. Projected function to be defined here. "Two-Buttons-Dimming and -Shutter" needs two inputs next to each other. Special pages will be faded in for all other functions. The parameters of the inputs can be precisely specified upon these pages. Single channels for function that needs only one input.

Table 3: Parameter Input-configuration

5.2.3 INTERLOCK

Independent of the other settings, the interlock settings are identical for all input functionality. For example Inputs A/B:



Picture 4: Configuration Interlock

ETS-Text	Range [Default value]	Comment
Interlock	inactive active [inactive]	Set active, if the object should be displayed and handled.
Interlock state	locked with value 1 locked with value 0 [locked with value 1]	Select with which value the input should be locked.
Interlock after reset	enabled locked send read request [enabled]	Determines if the input is locked or enabled after a reset. If necessary a read request can also be sent to get the actual state of this value.
Attach to global-interlock	disabled enabled [disabled]	If the central Interlock is enabled, it is to be determined if the single Interlock should "follow" the same state.

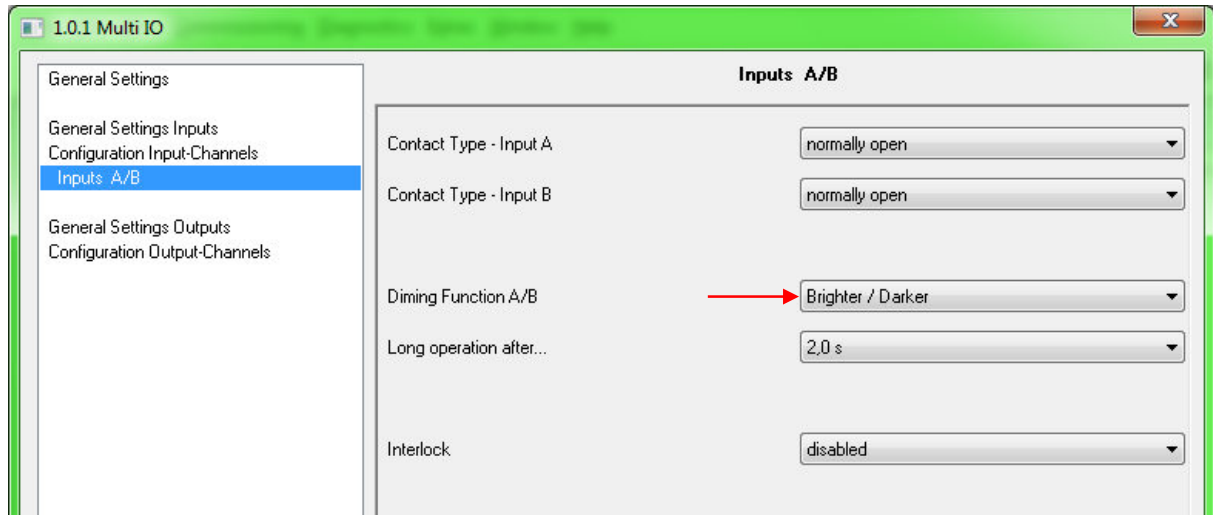
Table 4: Parameter Interlock

NOTE

If Interlock is activated, changes at the Input will not be considered until the Interlock is inactivated.

5.2.4 DIMMING A/B ... K/L

The following parameters are identical for each channel if accordingly parameterised.
For example Inputs A/B:



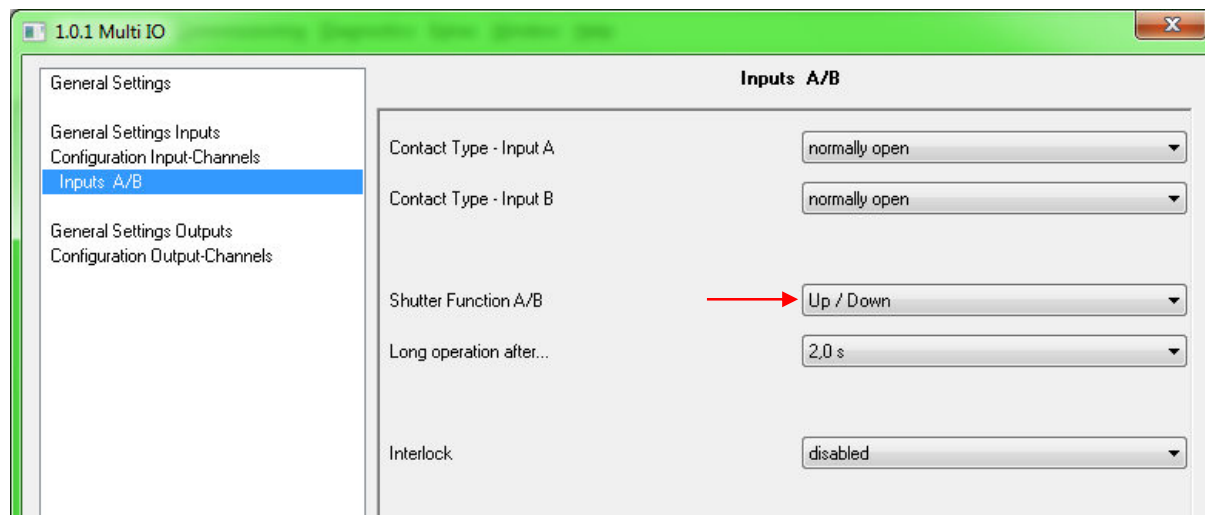
Picture 5: Parameters Diming

ETS-Text	Range [Default value]	Comment
Contact Type - Input A	normally open normally closed [normally open]	Defines, if the connected contact at the input is normally opened (NO) or normally closed (NC). If NO is selected, the input is logic high, after the contact is closed.
Contact Type - Input B	normally open normally closed [normally open]	Defines, if the connected contact at the input is normally opened (NO) or normally closed (NC). If NO is selected, the input is logic high, after the contact is closed.
Dimming Function A/B	Brighter/Darker Darker/Brighter [Brighter/Darker]	Defines, which input is responsible for dimming up und which one for dimming down. Brighter/Darker: Input A will dim up and switch on. Input B will dim down and switch off. Darker/Brighter: Input A will dim down and switch off. Input B will dim up and switch on.
Long operation after...	0,3; 0,5; 0,7; 1; 1,5; 2; 2,5; 3; 3,5; 4; 5,5; 6; 7; 8; 9; 10; 15; 20; 30 sec [2,0s]	Duration which the input needs to be logical high before dimming is started. If the input is logical high for a shorter time only a switch command will be sent.

Table 5: Parameters Dimming

5.2.5 SUN PROTECTION A/B ... K/L

The following parameters are identical for each channel.
For example Inputs A/B:



Picture 6: Parameters Sun protection

ETS-Text	Range [Default value]	Comment
Contact Type - Input A...	normally open normally closed [normally open]	Defines, if the connected contact at the input is normally opened (NO) or normally closed (NC). If NO is selected, the input is logic high, after the contact is closed.
Contact Type - Input B...	normally open normally closed [normally open]	Defines, if the connected contact at the input is normally opened (NO) or normally closed (NC). If NO is selected, the input is logic high, after the contact is closed.
Shutter Function A/B	Up/Down Down/Up [Up/Down]	Defines, which input is responsible for Shutter up und which one for Shutter down. Up/Down: Input A will move up. Input B will move down. Down/Up: Input A will move down. Input B will move up.
Long operation after...	0,3; 0,5; 0,7; 1; 1,5; 2; 2,5; 3; 3,5; 4; 5,5; 6; 7; 8; 9; 10; 15; 20; 30 sec [2,0s]	Duration which the input needs to be logical high before moving the shutter is started. If the input is logical high for a shorter time only a command to step the blinds will be sent.

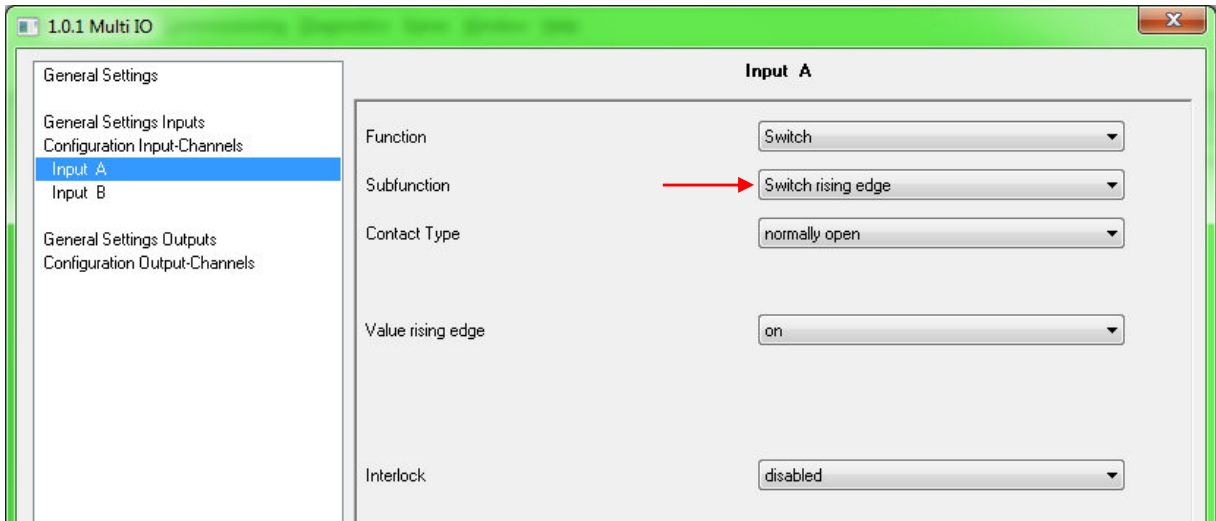
Table 6: Parameters Sun protection

There are 7 options for each channel:

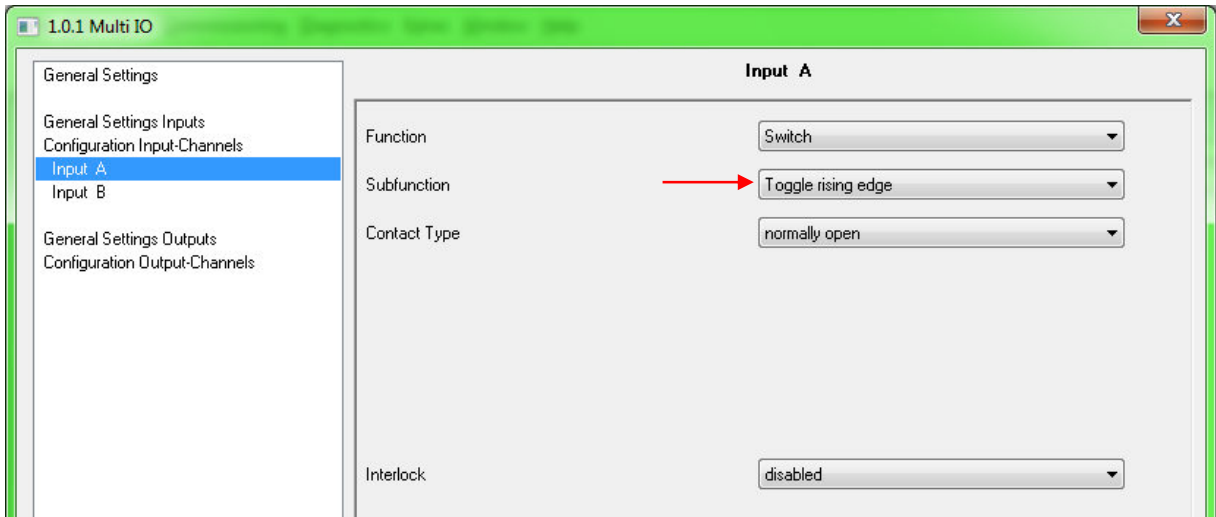
- Inactive,
- Switch,
- Scene,
- Counter,
- Send value,
- One Button Dimming,
- One Button Shutter.

5.2.6 SWITCH

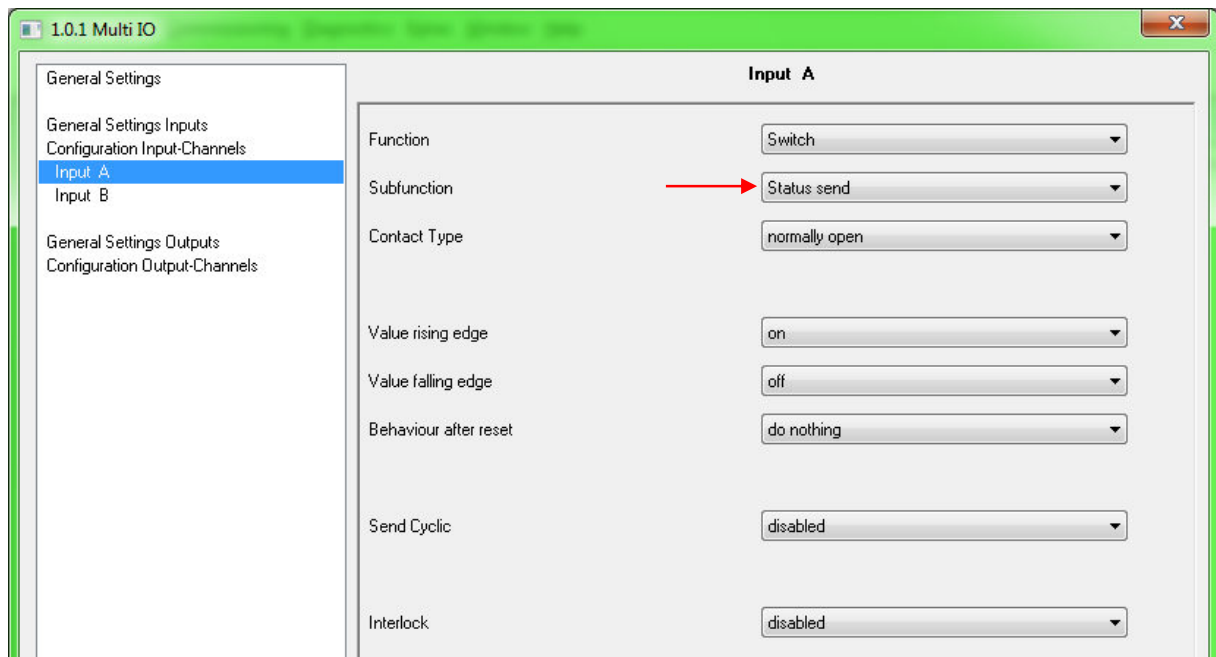
For example Input A:



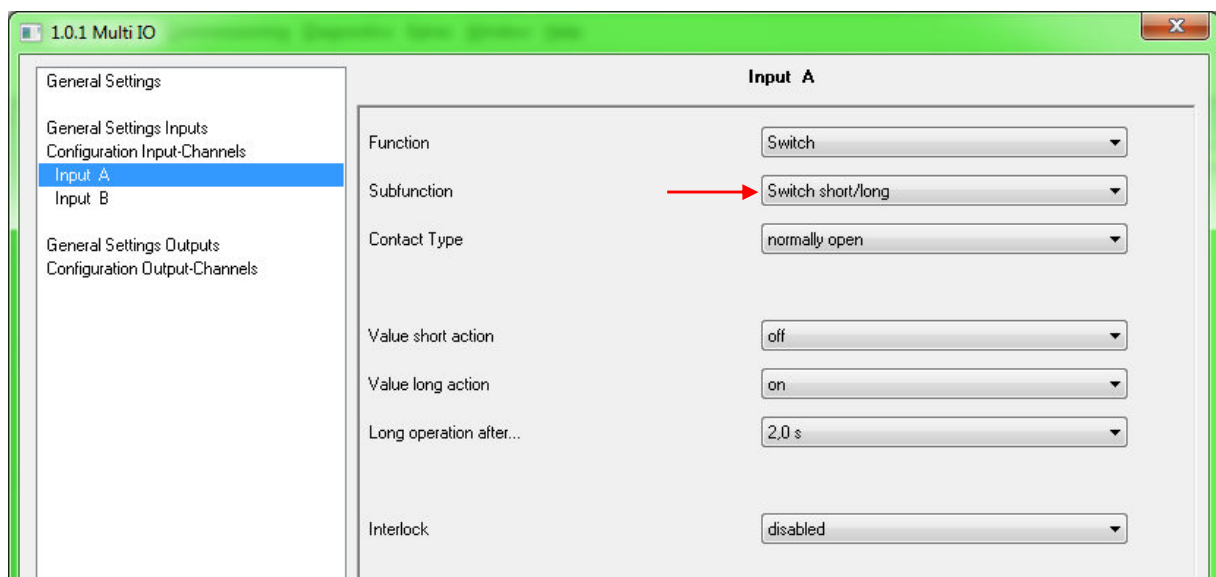
Picture 7: Parameters Switch, switch rising edge



Picture 8: Parameters Switch, toggle rising edge



Picture 9: Parameters Switch, status send

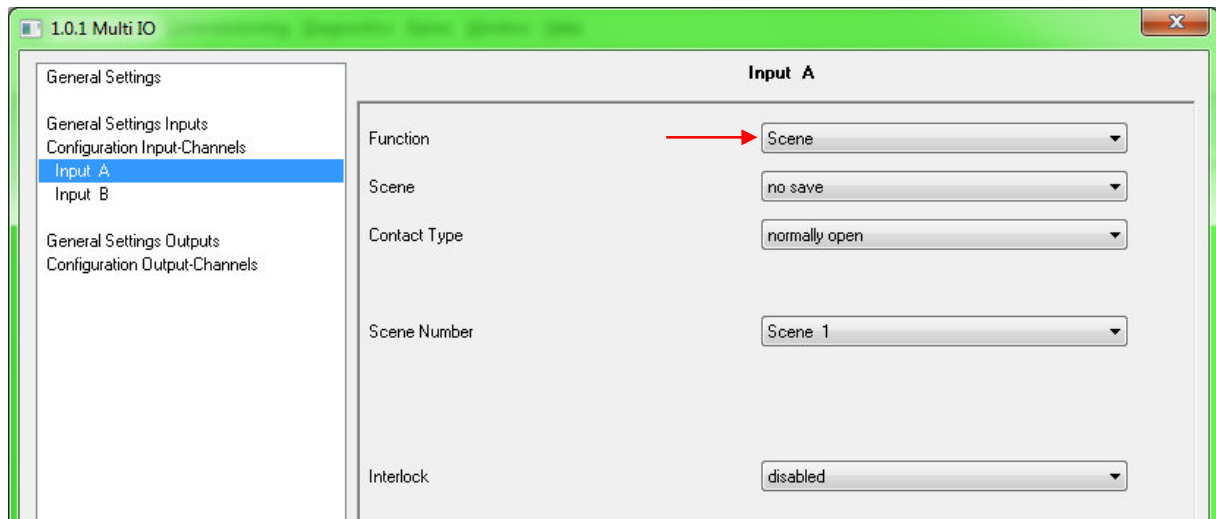


Picture 10: Parameters Switch, switch short/long

ETS-Text	Range [Default value]	Comment
Function	inactive Switch Scene Counter Send Value One Button Dimming One Button Shutter [inactive]	The projected function can be here selected for each input.
Sub function	Switch rising edge Toggle rising edge Status send Switch short/long [Switch rising edge]	This parameter defines on which event the value of the object should be changed.
Contact Type	normally open normally closed [normally open]	Defines, if the connected contact at the input is normally opened (NO) or normally closed (NC). If NO is selected, the input is logic high, after the contact is closed.
Value Rising Edge	off on [on]	This parameter is visible if Switch rising edge or Status send is selected. The defined value here will be sent to the object on a rising edge.
Value Falling Edge	off on [off]	If Status send. The defined value here will be sent to the object on a falling edge.
Behaviour after reset	do nothing send input state [do nothing]	If Status send. After a bus reset whether no reaction or send the input state.
Send cyclic	disabled if value = 1 if value = 0 if contact is opened or closed [disabled]	If Status send. If enabled, the objet value will be cyclically sent depending on this input value.
Cyclic send [s]	1... 3000 s [10]	Parameterised if send cyclic active.
Value short action	off on [off]	If switch short/long. The defined value here will be sent to the object on a rising edge.
Value long action	off on [on]	If switch short/long. The defined value here will be sent to the object on a rising edge.
Long operation after...	0,3; 0,5; 0,7; 1; 1,5; 2; 2,5; 3; 3,5; 4; 5,5; 6; 7; 8; 9; 10; 15; 20; 30 sec [2,0s]	If switch short/long. Duration which the input needs to be logical high before the function is started. If the input is logical high for a shorter time, only the command for short operation will be sent.

Table 7: Parameter Switch

5.2.7 SCENE

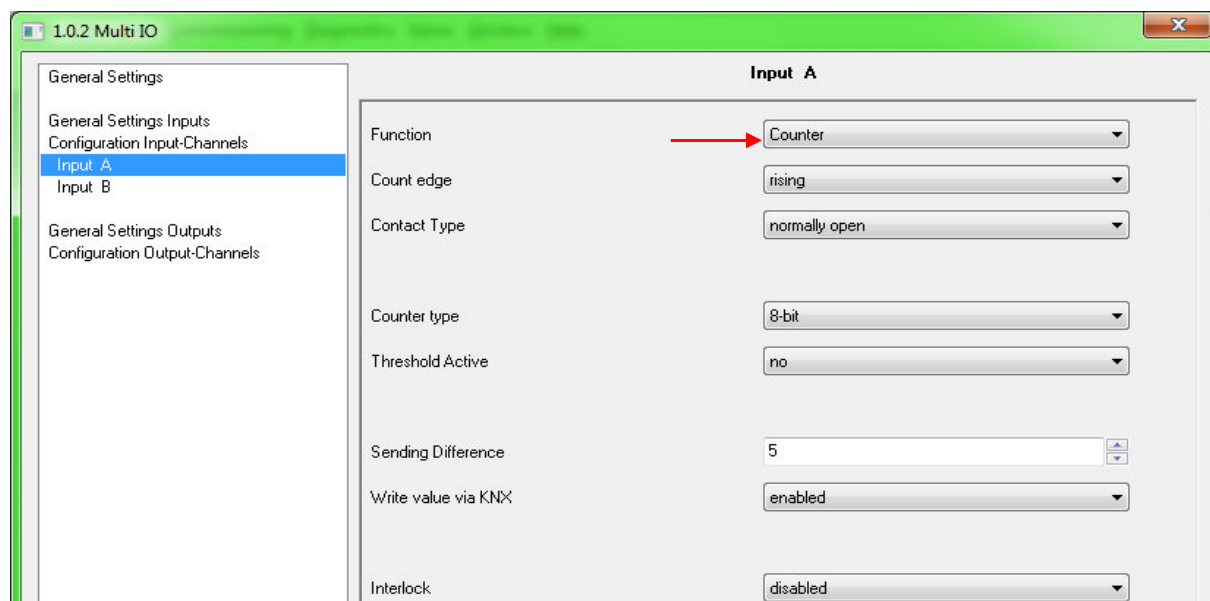


Picture 11: Parameters Scene

ETS-Text	Range [Default value]	Comment
Scene	no save save 1-Bit Scene [no save]	Defines save or no save for an 8-Bit-Scene. Or a 1-Bit-Scene. NOTE Scene saved after a signal duration of min. 3 sec.
Contact Type	normally open normally closed [normally open]	Defines, if the connected contact at the input is normally opened (NO) or normally closed (NC). If NO is selected, the input is logic high, after the contact is closed.
Scene Number	1... 64 [Scene 1]	64 possible 8-Bit-Scenes. Each scene can be recalled (only if no save or save parameterised).
Scene Number	1, 2. [Scene 1]	If 1-Bit-Scene parameterised.

Table 8: Parameter Scene

5.2.8 COUNTER

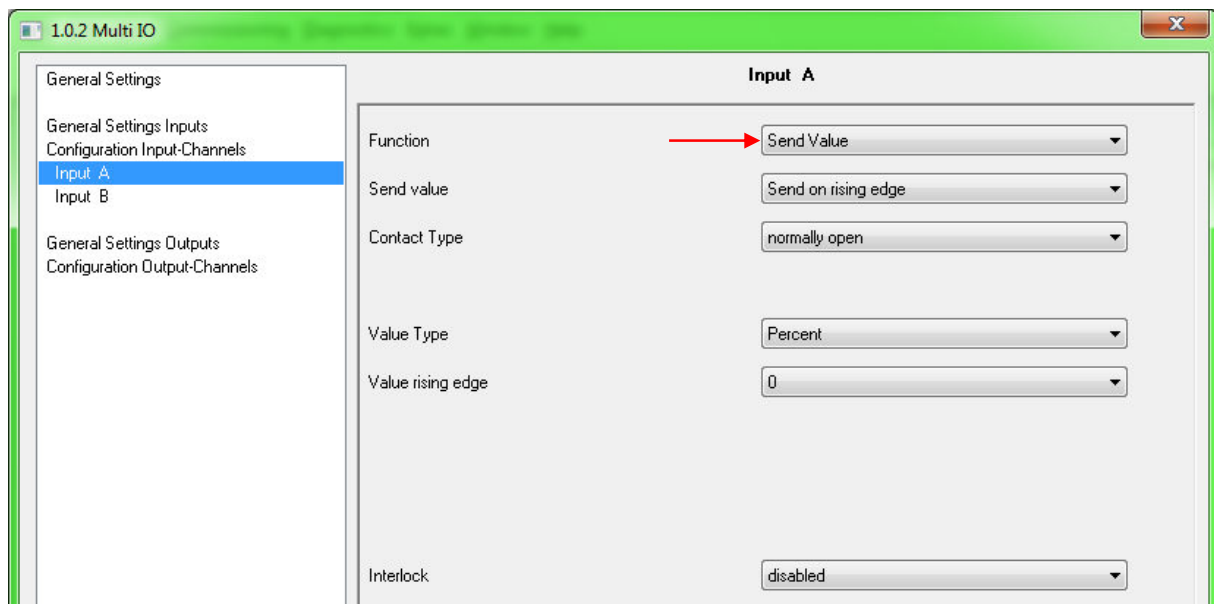


Picture 12: Parameters Counter

ETS-Text	Range [Default value]	Comment
Count edge	rising falling rising and falling [rising]	Determines on which edge(s) the counter increases.
Contact Type	normally open normally closed [normally open]	Defines, if the connected contact at the input is normally opened (NO) or normally closed (NC). If NO is selected, the input is logic high, after the contact is closed.
Counter Type	8-bit 16-bit 32-bit [8-bit]	3 possible counters. To be defined according to the application.
Threshold active	no yes [no]	To be set "yes" if a counter limit is needed.
Counter Limit	0... 255 [50]	8-bit counter and threshold active.
Sending Difference	0... 255 [5]	For 8-bit counter. Object sent if the parameterised difference is reached.
Counter Limit	0... 65535 [200]	16-bit counter and Threshold active
Sending Difference	0... 65535 [100]	For 16-bit counter. Object sent to the object if parameterised difference reached.
Counter Limit	0... 2147483647 [500]	32-bit counter and Threshold active
Sending Difference	0... 65535 [250]	For 32-bit counter. Object sent to the object if parameterised difference reached.
Write Value via KNX	disabled enabled [enabled]	To be enabled if a value is to be written in a counter via KNX bus.

Table 9: Parameter Counter

5.2.9 SEND VALUE



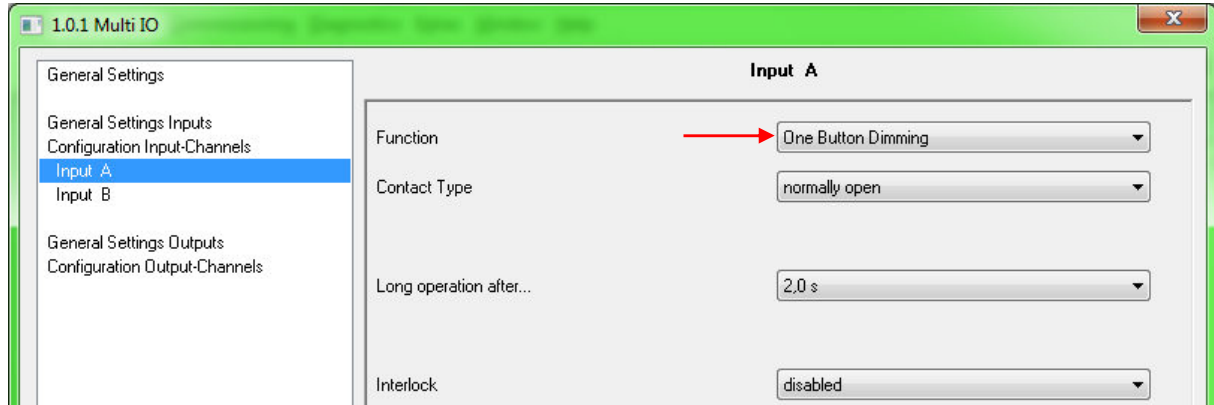
Picture 13: Parameters Send Value

ETS-Text	Range [Default value]	Comment
Send Value	Send on rising edge Send on both edges Send on short/long Send on long [Send on rising edge]	Here is to parameterise when the object is to be sent.
Contact Type	normally open normally closed [normally open]	Defines, if the connected contact at the input is normally opened (NO) or normally closed (NC). If NO is selected, the input is logic high, after the contact is closed.
Value Type	Percent Angle Temperature 2-bit value (forced operation) 8-bit value 16-bit value [Percent]	6 different types of values can be parameterised. See parameters below.
Value rising edge or Value short action	0...100% (0; 0,01; 0,02; 0,031) [0]	According Send Value and Value Type "Percent".
Value falling edge or Value long action	0...100% (0; 0,01; 0,02; 0,031) [0]	According Send Value and Value Type "Percent".
Value rising edge or Value short action	0... 360° (0°; 5°; 10°; 15°; 360°) [0]	According Send Value and Value Type "Angle".
Value falling edge or Value long action	0... 360° (0°; 5°; 10°; 15°; 360°) [0]	According Send Value and Value Type "Angle".
Value rising edge or Value short action [in 1/100°]	-27300... 32000 [0]	According Send Value and Value Type "Temperature".
Value falling edge or Value long action [in 1/100°]	-27300... 32000 [0]	According Send Value and Value Type "Temperature".

ETS-Text	Range [Default value]	Comment
Value rising edge or Value short action	ON, activate forced OFF, activate forced deactivate forced [deactivate forced]	According Send Value and Value Type "2-Bit".
Value falling edge or Value long action	ON, activate forced OFF, activate forced deactivate forced [deactivate forced]	According Send Value and Value Type "2-Bit".
Value rising edge or Value short action	0...255 [0]	According Send Value and Value Type "8-Bit".
Value falling edge or Value long action	0...255 [0]	According Send Value and Value Type "8-Bit".
Value rising edge or Value short action	0...65535 [0]	According Send Value and Value Type "16-Bit".
Value falling edge or Value long action	0...65535 [0]	According Send Value and Value Type "16-Bit".
Long operation after...	0,3; 0,5; 0,7; 1; 1,5; 2; 2,5; 3; 3,5; 4; 5,5; 6; 7; 8; 9; 10; 15; 20; 30 sec [2,0s]	If short/long activated. Duration which the input needs to be logical high before "send value" is started. If the input is logical high for a shorter time, only the command for short operation will be sent.

Table 10: Parameter Send Value

5.2.10 ONE BUTTON DIMMING

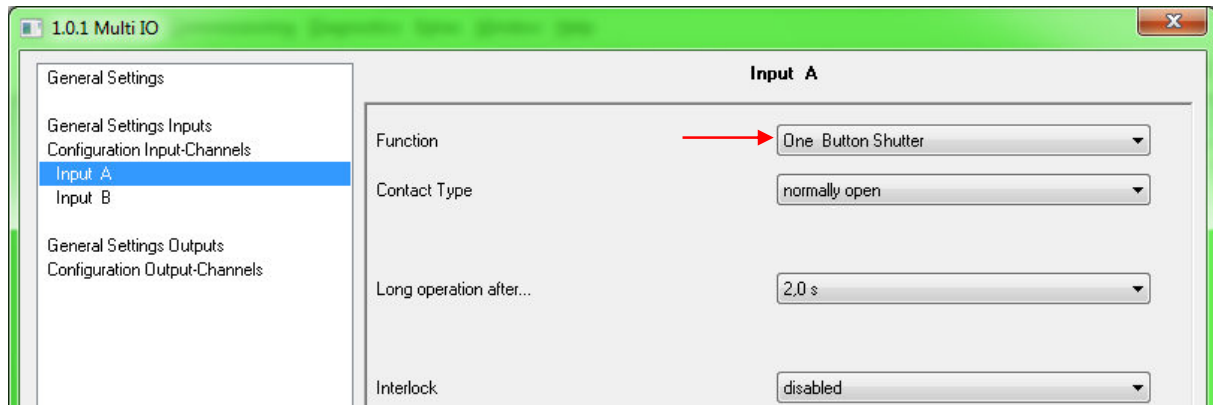


Picture 14: Parameters One Button Dimming

ETS-Text	Range [Default value]	Comment
Contact Type	normally open normally closed [normally open]	Defines, if the connected contact at the input is normally opened (NO) or normally closed (NC). If NO is selected, the input is logic high, after the contact is closed.
Long operation after...	0,3; 0,5; 0,7; 1; 1,5; 2; 2,5; 3; 3,5; 4; 5,5; 6; 7; 8; 9; 10; 15; 20; 30 sec [2,0s]	Duration which the input needs to be logical high before dimming is started. If the input is logical high for a shorter time only a switch command will be sent.

Table 11: Parameter One Button Dimming

5.2.11 ONE BUTTON SHUTTER



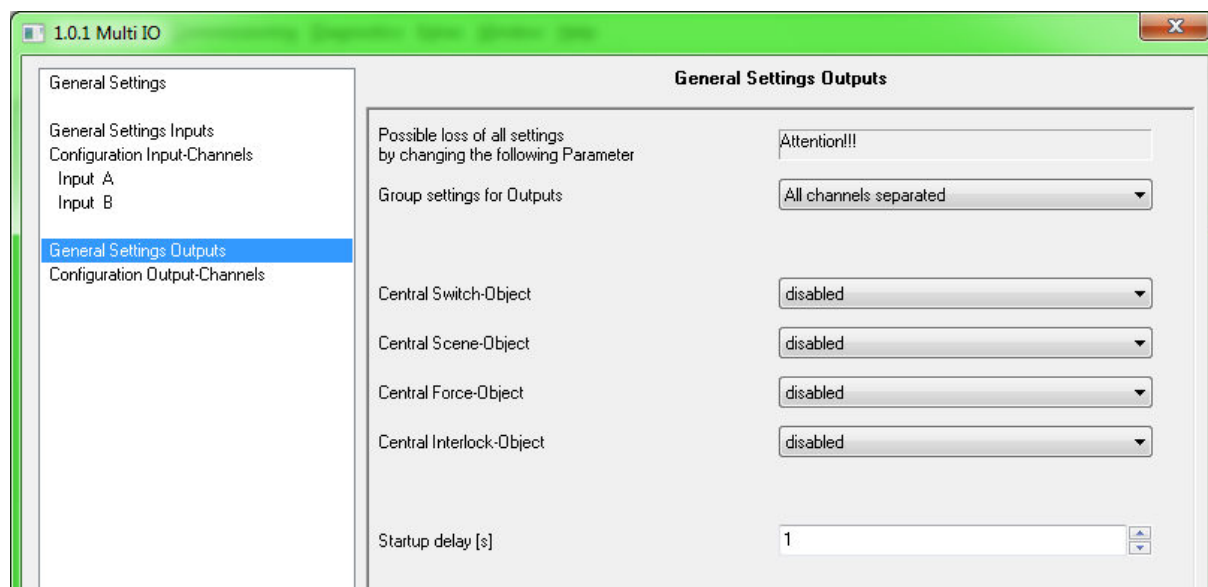
Picture 15: Parameters One Button Shutter

ETS-Text	Range [Default value]	Comment
Contact Type	normally open normally closed [normally open]	Defines, if the connected contact at the input is normally opened (NO) or normally closed (NC). If NO is selected, the input is logic high, after the contact is closed.
Long operation after...	0,3; 0,5; 0,7; 1; 1,5; 2; 2,5; 3; 3,5; 4; 5,5; 6; 7; 8; 9; 10; 15; 20; 30 sec [2,0s]	Duration which the input needs to be logical high before moving the shutter is started. If the input is logical high for a shorter time only a switch command will be sent.

Table 12: Parameter One Button Shutter

5.3 SETTINGS OUTPUTS

5.3.1 GENERAL SETTINGS

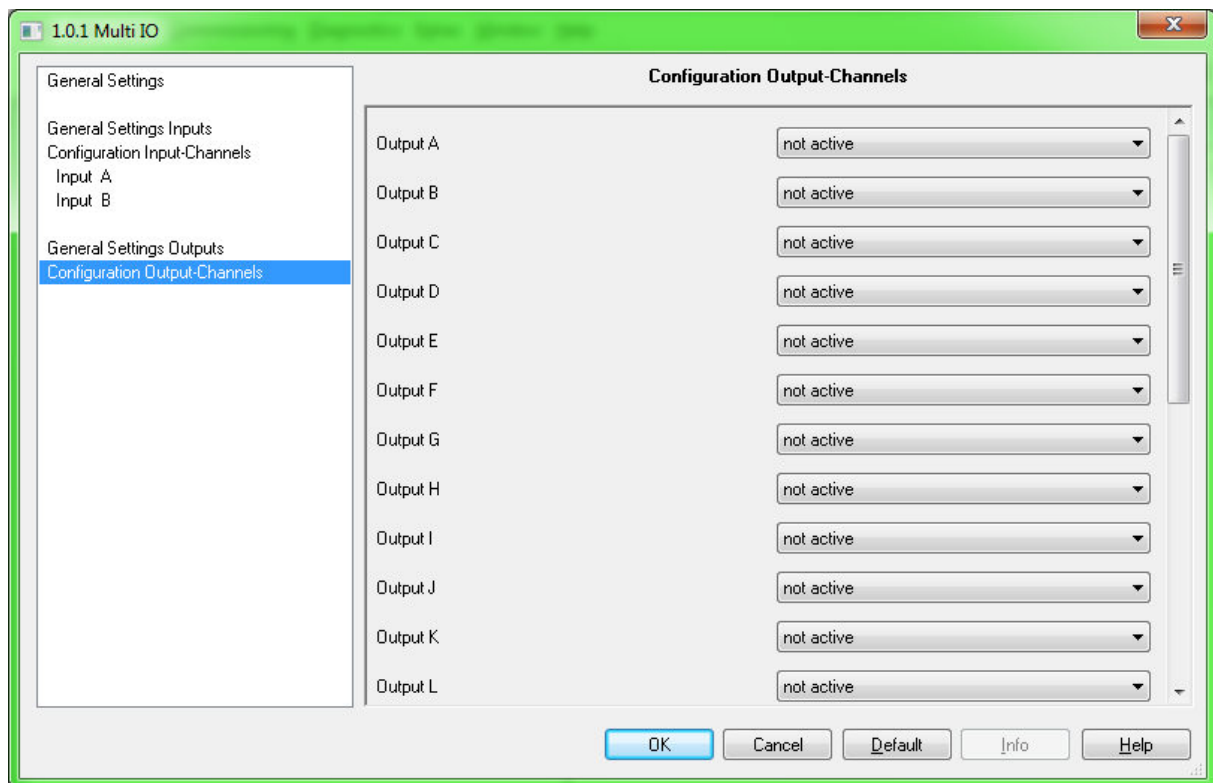


Picture 16: Parameters General Settings

ETS-Text	Range [Default value]	Comment
Group settings for Outputs	All channels separated A-L together A-F together / G-L separated A-F separated / G-L together A-F together / G-L together [All channels separated]	Depending on how the channels are going to be used, it is to be defined here if "separated" or "together". WARNING By changing this parameter all settings could be lost!
Central Switch-Object	disabled enabled [disabled]	If enabled the corresponding object appears for all outputs. This function simplifies for the user to project the application and makes use of less association.
Central Scene-Object	disabled enabled [disabled]	Same as above.
Central Force-Object	disabled enabled [disabled]	This is a 2-bit-object. Same as above.
Central Interlock-Object	disabled enabled [disabled]	This is a 1-bit object. Same as above.
Startup delay [s]	0 -60 sec [1 s]	Delay for all outputs (e.g. for "behaviour at reset")

Table 13: Parameter General Settings

5.3.2 CONFIGURATION OUTPUTS

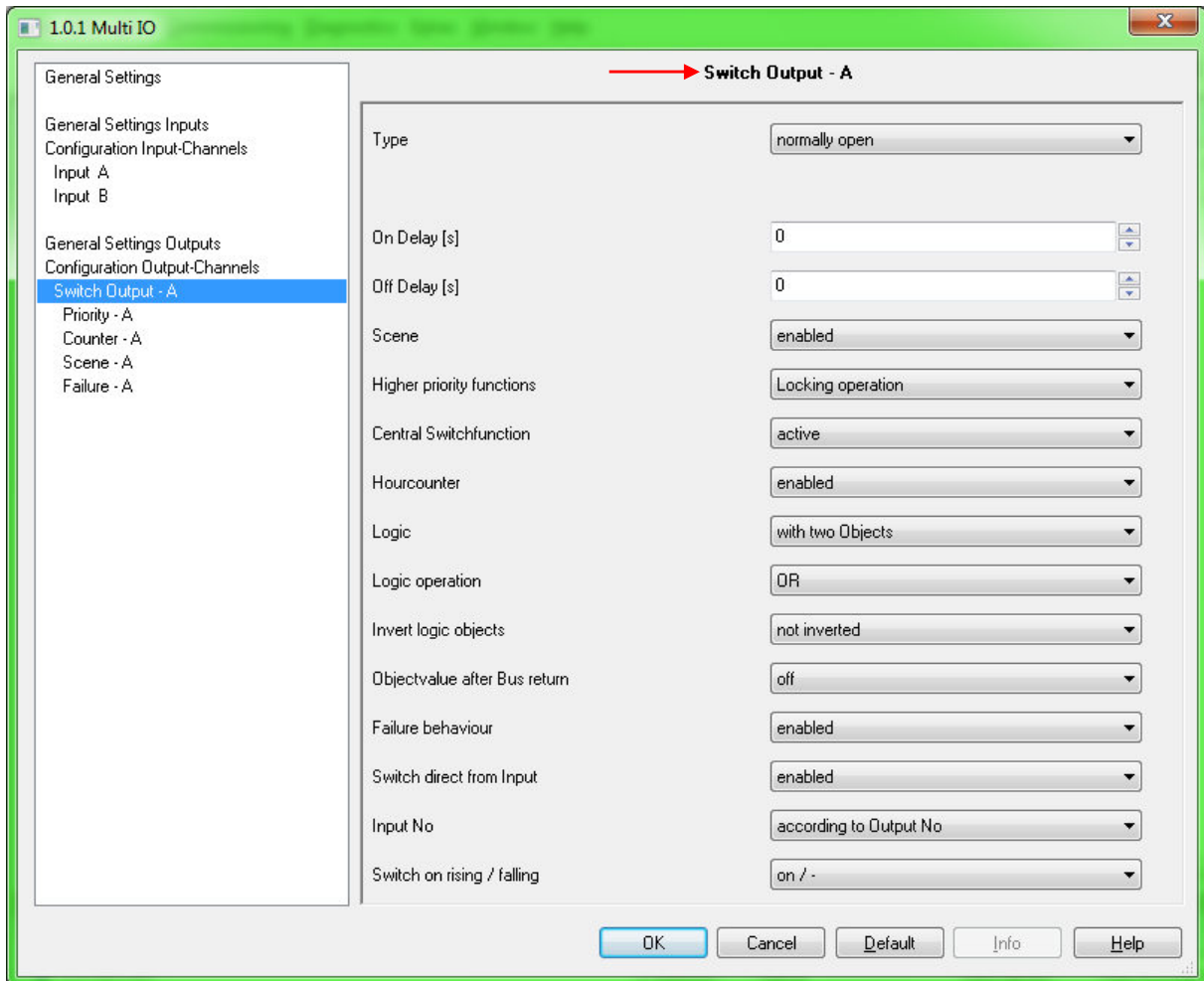


Picture 17: Parameters Configuration Outputs

ETS-Text	Range [Default value]	Comment
Output A-L	not active Switch Staircase [not active]	2 possible functions can be defined or corresponding channel is "not active".

Table 14: Parameter Configuration Outputs

5.3.3 SWITCH



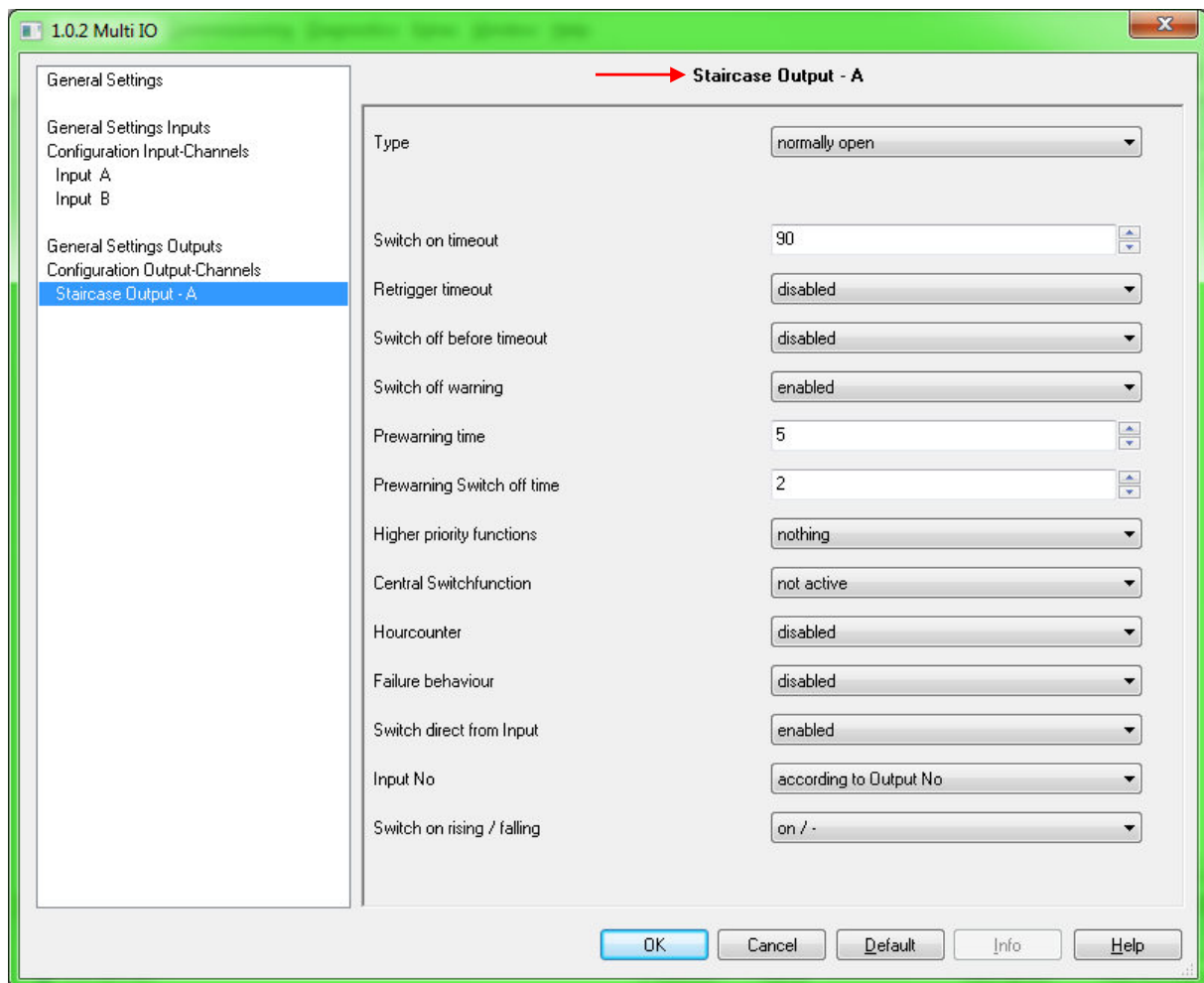
Picture 18: Parameters Output Switch

ETS-Text	Range [Default value]	Comment
Type	normally open normally closed [normally open]	Defines, if the connected contact at the output is normally opened (NO) or normally closed (NC). If NO is selected, the contact will be closed on logic high.
On Delay [s]	0... 30000 [0]	Delay until the switch reacts for "on". Can be here parameterised in seconds.
Off Delay [s]	0... 30000 [0]	Delay until the switch reacts for "off". Can be here parameterised in seconds.
Scene	disabled enabled [disabled]	If enabled, opens a Subpage "Scene" in the "General Settings Outputs".
Higher priority functions	nothing Locking operation Priority function [nothing]	If enabled, opens a Subpage "Priority" in the "General Settings Outputs".
Central Switch function	not active active [not active]	This parameter can enable the central switch function (if enabled) or not.
Hour Counter	disabled enabled [enabled]	If enabled, opens a Subpage "Counter" in the "General Settings Outputs".

Logic	not active with one Object with two Objects [not active]	If enabled, the following 3 parameters appear beneath and are to be parameterised. Only one type of object (OR or AND) if "with two objects" selected.
Logic operation	OR AND [OR]	Two possible logic operations.
Invert logic objects	not inverted inverted [not inverted]	Logic objects can be here inverted if needed for the application.
Object value after Bus return	off on send read request [off]	The object value after a bus recovery can be predefined "on" or "off", or a "read request" for the object will be sent previously.
Failure behaviour	disabled enabled [disabled]	If enabled, opens a Subpage "Failure" in the "General Settings Outputs".
Switch direct from Input	disabled enabled [disabled]	If enabled, the following 2 parameters appear beneath and are to be parameterised.
Input Number	according to Output No A...L [according to Output No]	This parameter is used to set whether and which binary inputs are to have a direct effect on the respective outputs. With the direct effect of an input on the output of the same name, every signal-change from "0" to "1" at the input leads to a switching condition change at the output.
Switch on rising / falling	toggle / - on / - on / off [on/-]	A signal change at the input has a direct change at the output. A change can toggle the output, set it "on" or "on/off".

Table 15: Parameters Output Switch

5.3.4 STAIRCASE



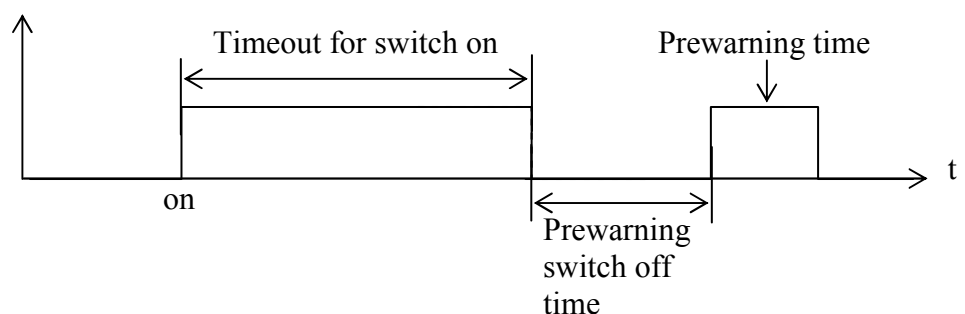
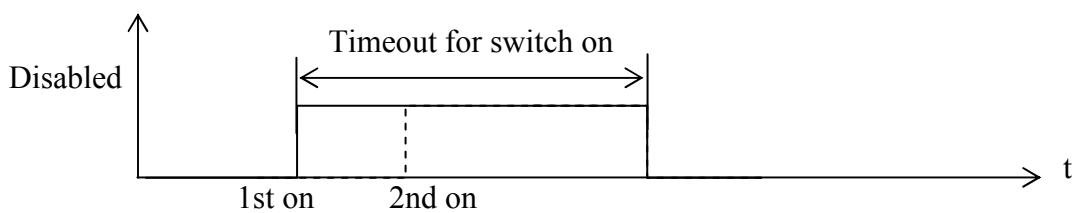
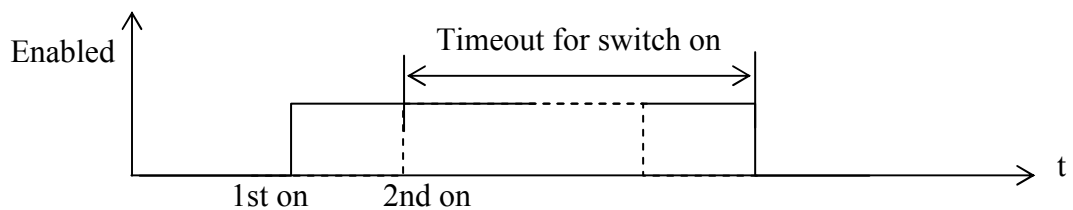
Picture 19: Parameters Output Staircase

ETS-Text	Range [Default value]	Comment
Type	normally open normally closed [normally open]	Defines, if the connected contact at the output is normally opened (NO) or normally closed (NC). If NO is selected, the contact will be closed on logic high.
Switch on timeout	0...30000 [90]	See diagram below.
Retrigger timeout	disabled enabled [disabled]	See diagram below.
Switch off before timeout	disabled enabled [disabled]	See diagram below.
Switch off warning	disabled enabled [disabled]	If enabled, the following 2 parameters appear beneath and are to be parameterised.
Prewarning time	0... 30000 [5]	See diagram below.
Prewarning Switch off time	0... 30000 [2]	See diagram below.

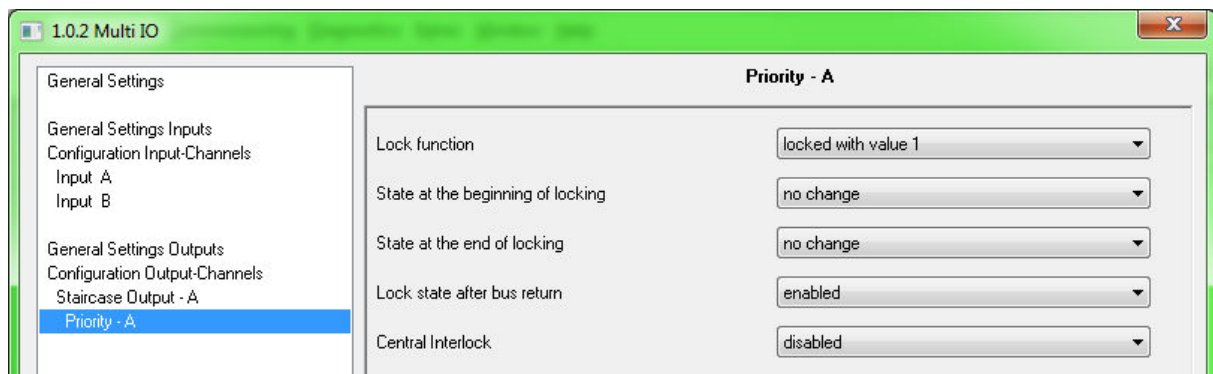
Higher priority functions	nothing Locking operation Priority function [nothing]	If enabled, opens a Subpage "Priority" in the "General Settings Outputs".
Central Switch function	not active active [not active]	This parameter can enable the central switch function (if enabled) or not.
Hour Counter	disabled enabled [disabled]	If enabled, opens a Subpage "Counter" in the "General Settings Outputs".
Failure behaviour	disabled enabled [disabled]	If enabled, opens a Subpage "Failure" in the "General Settings Outputs".
Switch direct from Input	disabled enabled [disabled]	If enabled, the following 2 parameters appear beneath and are to be parameterised.
Input Number	according to Output No A...L [according to Output No]	This parameter is used to set whether and which binary inputs are to have a direct effect on the respective outputs. With the direct effect of an input on the output of the same name, every signal-change from "0" to "1" at the input leads to a switching condition change at the output.
Switch on rising / falling	on / - on / off [on / -]	A signal change at the input has a direct change at the output. A change can set the output "on" or "on/off".

Table 16: Parameters Output Staircase

Retrigger Timeout



5.3.5 SUBPAGE PRIORITY LOCKING

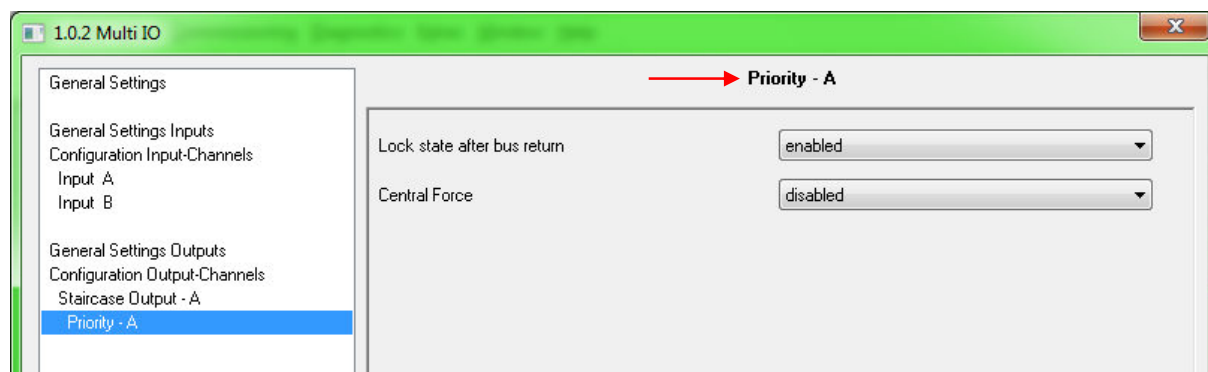


Picture 20: Parameters Priority Locking

ETS-Text	Range [Default value]	Comment
Lock function	locked with value 1 locked with value 0 [locked with value 1]	Lock function depending on the value received. For example if "value 1" defined and log. 1 is received, then is locking enabled.
State at the beginning of locking	off on (Switch) on (Staircase) no change [no change]	Parameter to define the channel state at the beginning of locking. If "no change" then priority goes to the higher function.
State at the end of locking	off on no change [no change]	Parameter to define the channel state at the end of locking. If "no change" then priority goes to the higher function.
Lock state after bus return	enabled locked send read request [enabled]	Channel state is enabled, locked or a read request is sent after bus recovery. This is a security function.
Central Interlock	disabled enabled [disabled]	This parameter can enable the central Interlock function (if enabled) or not.

Table 17: Parameters Priority Locking

5.3.6 SUBPAGE PRIORITY FORCE

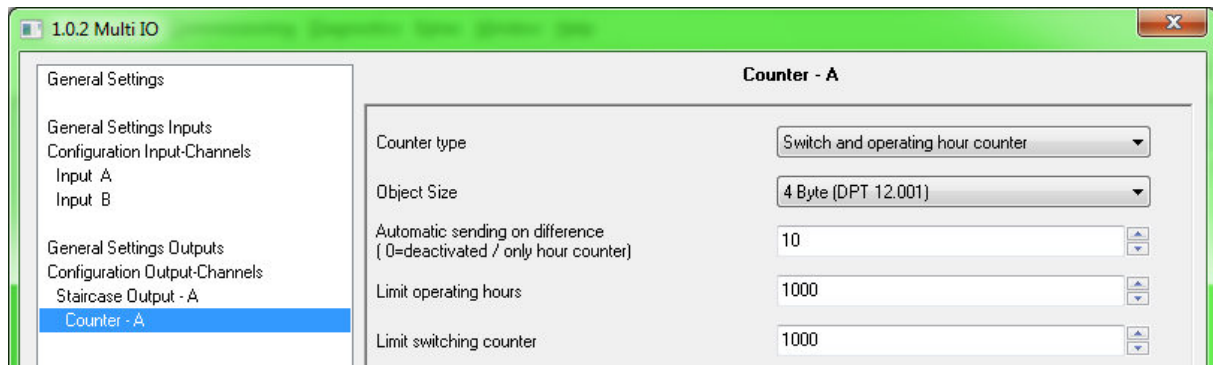


Picture 21: Parameters Priority Force

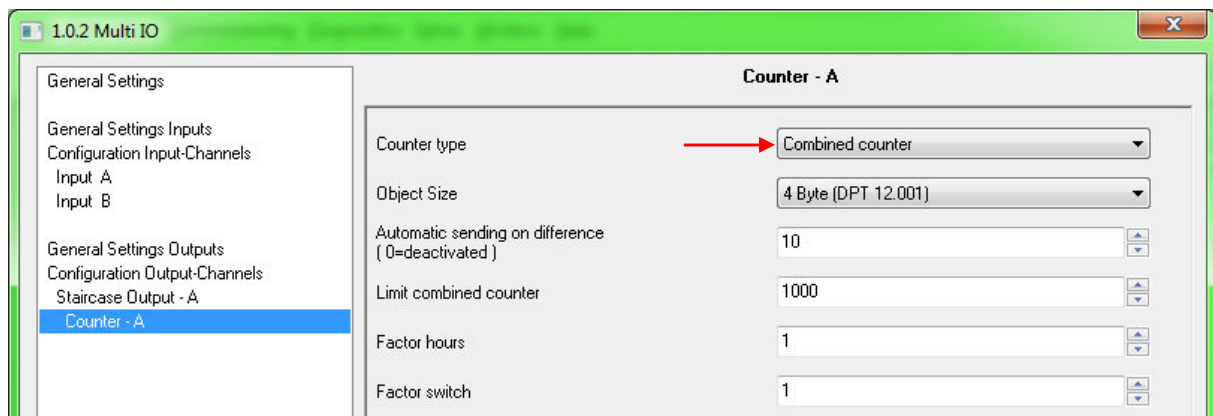
ETS-Text	Range [Default value]	Comment
Lock state after bus return	enabled locked – on locked – off send read request [enabled]	Parameter is to define if after a bus recovery the state of the channel is enabled (as it was before bus reset) or locked on/off or a “read request” is to be sent previously.
Central Force	disabled enabled [disabled]	This parameter can enable the central Force function (if enabled) or not.

Table 18: Parameters Priority Force

5.3.7 SUBPAGE HOUR COUNTER



Picture 22: Parameters hour counter

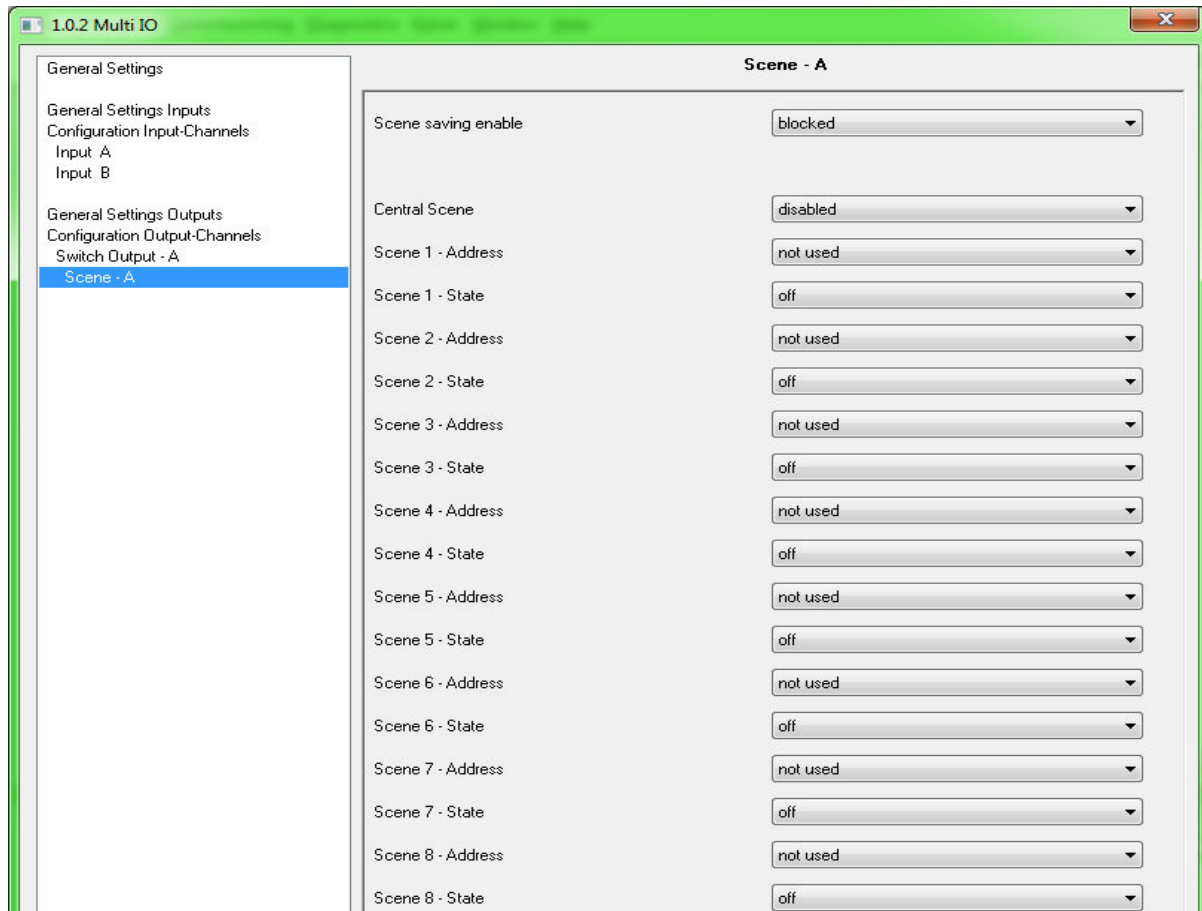


Picture 23: Parameters Combined Counter

ETS-Text	Range [Default value]	Comment
Counter Type	Operating hour counter Switch counter Switch and operating hour counter Combined counter [Operating hour counter]	Parameter to define which counter is to be selected for the application.
Object Size	4 Byte (DPT 12.001) 2 Byte (DPT 7.001) [4 Byte (DPT 12.001)]	2 possible counter size. To be parameterised as needed (different limits).
Automatic sending on difference (0=deactivated)	0-65535 [10]	If switch and hour counter, this is only for the hours.
Limit operating hours	0-2147483647 (4 Byte) 0-65535 (2 Byte) [1000]	Range for the two possible counter lengths.
Limit switching counter	0-2147483647 (4 Byte) 0-65535 (2 Byte) [1000]	Range for the two possible counter lengths.
Limit combined counter	0-2147483647 (4 Byte) 0-65535 (2 Byte) [1000]	Range for the two possible counter lengths.
Factor hours (combined counter)	0-65535 (2 Byte) [1]	Factor to give counted hours/switches more/less importance.
Factor switch (combined counter)	0-65535 (2 Byte) [1]	Factor to give counted hours/switches more/less importance.

Table 19: Parameters Hour counter

5.3.8 SUBPAGE SCENE

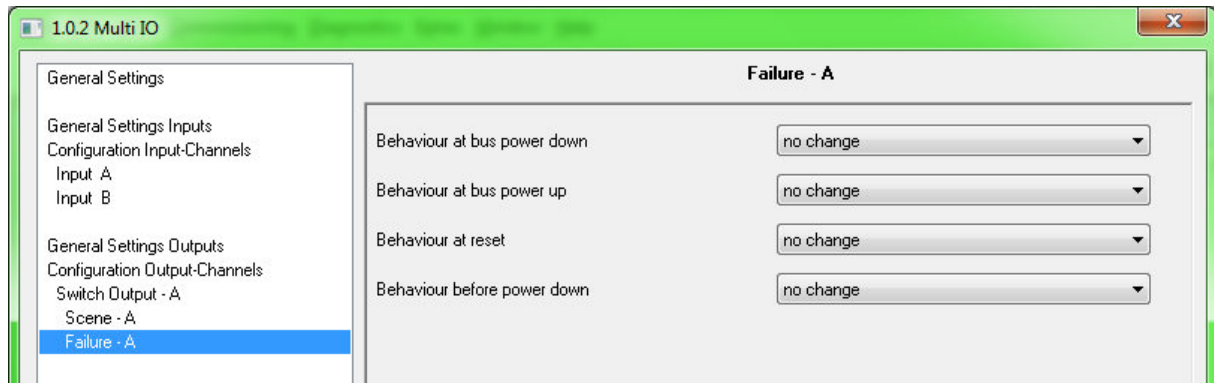


Picture 24: Parameters Scene

ETS-Text	Range [Default value]	Comment
Scene saving enable	blocked free [blocked]	If parameterised "free": scenes can be saved "externally". If "blocked", no scene can be saved. NOTE A download in the ETS will overwrite every saved scene!
Central Scene	disabled enabled [disabled]	If parameterised "enabled" a central scene can control this output.
Scene 1 - Address	not used 1-64 [not used]	One of 64 scenes can be selected for this output.
Scene 1- State	off on [off]	Defines the current switching status of the output for this scene.
...		
Scene 8 - Address	not used 1-64 [not used]	Same as above.
Scene 8- State	off on [off]	Same as above.

Table 20: Parameters Scene

5.3.9 SUBPAGE FAILURE BEHAVIOUR



Picture 25: Parameters Failure Behaviour

ETS-Text	Range [Default value]	Comment
Behaviour at bus power down	off on (Switch) on (Staircase) no change [no change]	If Bus power is down it should be here defined which state the actuator should take in this case (for security reasons too).
Behaviour at bus power up	off on (Switch) on (Staircase) no change value as before (Switch) [no change]	If Bus power is (re)started it should be here defined which state the actuator should take in this case (for security reasons too).
Behaviour at reset	off on (Switch) on (Staircase) no change value as before (Switch) [no change]	If a Reset occurs it should be here defined which state the actuator should take in this case (for security reasons too).
Behaviour before power down	off on (Switch) on (Staircase) no change [no change]	Before the Bus power is down it should be here defined which state the actuator should take in this case (for security reasons too).

Table 21: Parameters Failure Behaviour

6 GLOSSARY

Communication Objects

See Group Communication Object

Group address (GA)

Group addresses are used to link group communication objects.

See Group Communication Object

Group Object

See Group Communication Object

Group Communication Objects

Group communication objects contains the data points which are transmitted via runtime communication. One or more group addresses can be assigned to group communication objects. Always on group address is the sending address. Via this address the values of the group communication object are sent on the bus. The other group addresses are only used to receive values.

Other words for group communication object are

- group object
- communication objects

Physical Address

This address is the unique device address inside a KNX-System. This address is independent of the group addresses and is used for configuration of the device.