PRODUCT MANUAL

ABB i-bus® KNX

SA/S X.X.2.2

Switch Actuator

Table of contents

1 About this document

1.1 Using the product manual

This manual provides detailed technical information on the function, installation and programming of the ABB i-bus® KNX device.

1.2 Legal disclaimer

ABB AG reserves the right to make changes to the product or modify the contents of this document without prior notice.

The agreed properties are definitive for any orders placed. ABB AG does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

1.3 Explanation of symbols

1. 2. ⇨	Instructions in specified sequence and result
▶	Individual actions
a)	Priorities
1)	Processes run by the device in a specific sequence
•	List level 1
–	List level 2

Tab. 1: Explanation of symbols

Notes and warnings are represented as follows in this manual:

DANGER
This symbol is a warning about electrical voltage and indicates high-risk hazards that will definitely result in death or serious injury unless avoided.

DANGER
Indicates high-risk hazards that will definitely result in death or serious injury unless avoided.

WARNING
Indicates medium-risk hazards that could result in death or serious injury unless avoided.

CAUTION
Indicates low-risk hazards that could result in slight or moderate injury unless avoided.

NOTICE
Indicates a risk of malfunctions or damage to property and equipment, but with no risk to life and limb.

Example:
For use in application, installation and programming examples

Note
For use in tips on usage and operation

2 Safety

2.1 General safety instructions

- Protect the device from moisture, dirt and damage during transport, storage and operation.
- Operate the device only in a closed housing (distribution board).
- Operate the device only within the specified technical data.
- Mounting, installation, commissioning and maintenance must be carried out only by qualified electricians. (old)
- Disconnect device from the supply of electrical power before mounting.

2.2 Proper use

The Switch Actuators are intended to be used to switch ohmic, inductive and capacitive loads, as well as LED and fluorescent lighting loads in a KNX environment.

3 Product overview

3.1 Device description

The Switch Actuators 2-, 4-, 8-, 12-fold are modular installation devices in pro*M* design. The devices are designed for installation in electrical distribution boards and small housings for rapid mounting on a 35 mm mounting rail (according to EN 60715).

The devices possess mutually independent switching relays with which the following functions can be implemented:
- Switching electric consumers (alternating or three-phase current)

The devices are provided with bus voltage via the (ABB i-bus® KNX). The connection to the bus (ABB i-bus® KNX) is implemented using the bus connection terminal. The consumers are connected at the outputs using screw terminals (terminal designation on the housing).

3.1.1 Toggle switches

The toggle switches indicate the position of the contacts:
- closed (I)
- open (0).

The contacts can be switched on (I) and off (0) manually using the toggle switches even:
- if an output is disabled by a safety function
- in case of bus voltage failure

3.1.2 Product name description

Abbreviation	Description		
S	Switch		
A	Actuator		
/S	MDRC		
x.	2	=	2-fold
	4	=	4-fold
	8	=	8-fold
	12	=	12-fold
x.	6	=	6 A
	10	=	10 A
	16	=	16 A
x.	2	=	Manual operation
x	x	=	Version number (x = 1, 2, etc.)

Tab. 2: Product name description

3.2 Ordering details

Description	MB	Type	Order no.	Packaging unit [pcs.]	Weight (incl. packaging) [kg]
Switch	2	SA/S 2.6.2.2	2CDG 110 253 R0011	1	0.197
Switch	4	SA/S 4.6.2.2	2CDG 110 254 R0011	1	0.292
Switch	8	SA/S 8.6.2.2	2CDG 110 255 R0011	1	0.500
Switch	12	SA/S 12.6.2.2	2CDG 110 256 R0011	1	0.718
Switch	2	SA/S 2.10.2.2	2CDG 110 257 R0011	1	0.197
Switch	4	SA/S 4.10.2.2	2CDG 110 258 R0011	1	0.292
Switch	8	SA/S 8.10.2.2	2CDG 110 259 R0011	1	0.500
Switch	12	SA/S 12.10.2.2	2CDG 110 260 R0011	1	0.718
Switch	2	SA/S 2.16.2.2	2CDG 110 261 R0011	1	0.197
Switch	4	SA/S 4.16.2.2	2CDG 110 262 R0011	1	0.292
Switch	8	SA/S 8.16.2.2	2CDG 110 263 R0011	1	0.500
Switch	12	SA/S 12.16.2.2	2CDG 110 264 R0011	1	0.718

Tab. 3: Ordering details

3.3 Switch Actuator SA/S 2.6.2.2

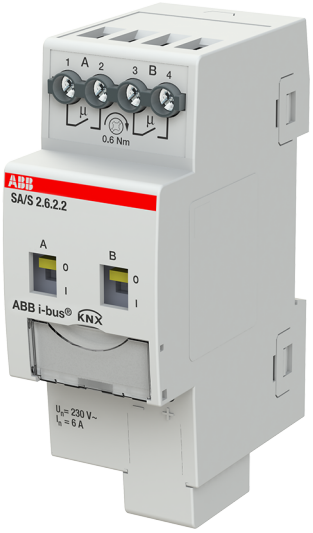

Fig. 1: Device illustration SA/S 2.6.2.2

The Switch Actuator is a modular installation device in pro*M* design. The device is designed for installation in electrical distribution boards and small housings for rapid mounting on a 35-mm mounting rail (to EN 60715).

The device possesses mutually independent switching relays with which the following functions can be implemented:

- Switching electric consumers (alternating or three-phase current)

The device is provided with bus voltage via the bus (ABB i-bus® KNX). The connection to the bus (ABB i-bus® KNX) is implemented using the bus connection terminal. The consumers are connected at the outputs using screw terminals (terminal designation on the housing).

The outputs can be switched manually using toggle switches.

3.3.1 Dimension drawing

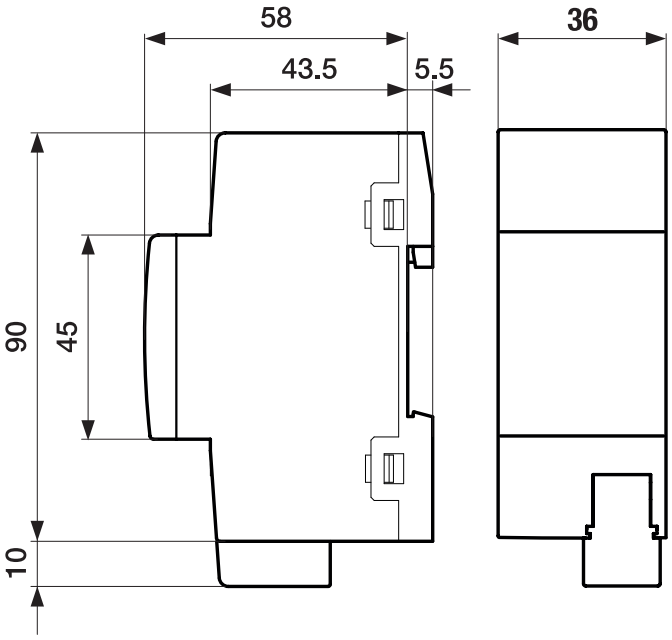

Fig. 2: Dimension drawing

3.3.2 Connection diagram

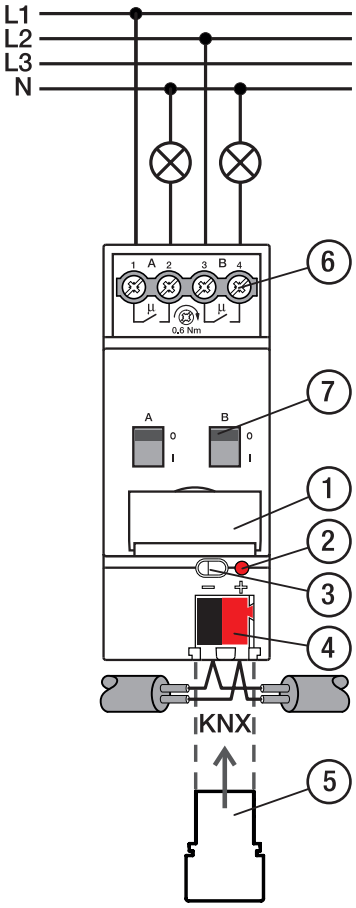

Fig. 3: Connection diagram

Legend

1 Label carriers
2 Programming LED
3 Programming button
4 Bus connection terminal
5 Cover cap
6 Load circuit, two screw terminals each
7 Contact position indication and ON/OFF actuation

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3.3.3 Operating and display elements

Button/LED	Description/function	LED indicator
 Programming	Assignment of the physical address	On: The device is in programming mode.
 Toggle switches	The toggle switches indicate the position of the contacts: closed (I), open (0). The load circuits can be switched on (I) and off (0) manually using the toggle switches.	Not available

3.3.4 Technical data

3.3.4.1 General technical data

Supply	Bus voltage	21 … 32 V DC
	Current consumption, bus	< 12 mA
	Power loss, bus	Max. 250 mW
	Power loss, device	0.9 W
Connections	KNX	Ø 0.8 mm single core (via bus connection terminal)
Connection terminals	Screw terminal	Screw terminal with universal head (PZ 1)
		0.2 … 4 mm² stranded, 2 × (0.2 … 2.5 mm²)
		0.2 … 6 mm² single core, 2 × (0.2 … 4 mm²)
	Ferrule without plastic sleeve	0.25 … 2.5 mm²
	Ferrule with plastic sleeve	0.25 … 4 mm²
	TWIN ferrules	0.5 … 2.5 mm²
	Ferrule contact pin length	Min. 10 mm
	Tightening torque	Max. 0.6 Nm
Degree of protection and protection class	Degree of protection	IP 20 to EN 60529
	Protection class	II to EN 61140
Isolation category	Overvoltage category	III to EN 60664-1
	Pollution degree	II to EN 60664-1
	Fire classification	Flammability V-0 as per UL94
SELV	KNX safety extra low voltage	SELV 24 V DC
Temperature range	Operation	–5 … +45 °C
	Transport	-25 … +70 °C
	Storage	-25 … +55 °C
Ambient conditions	Maximum air humidity	95 %, no condensation allowed
Design	Modular installation device (MDRC)	Modular installation device
	Design	pro*M*
	Housing/color	Plastic, gray
Dimensions	Dimensions	90 x 36 x 63.5 mm (H x W x D)
	Mounting width in space units	2 modules
	Mounting depth	63.5 mm
Mounting	35 mm mounting rail	To EN 60715
	Mounting position	Any
	Weight (net)	0.13 kg
Approvals	KNX certification	To EN 50090-1, -2
	CE marking	In accordance with the EMC and Low Voltage Directives

3.3.4.2 Device type

Device type	Switch Actuator	SA/S 2.6.2.2
	Application	Switch Standard 2f 6A / …
		… = current version number of the application
	Maximum number of group objects	136
	Maximum number of group addresses	1,000
	Maximum number of assignments	1,000

Note
Observe software information on the website → www.abb.com/knx.

Note
The device supports the locking function of a KNX device in ETS. If a BCU code was assigned, the device can be read and programmed only with this BCU code.

3.3.4.3 Output, rated current 6 A

Rated values	Number of outputs	2
	U_n rated voltage	230 V AC (50/60 Hz)
	I_n rated current (per output pair)	6 A
	Maximum current per device	2 x 6 A
Switching currents	AC3 operation (cos ϕ= 0.45) to EN 60947-4-1	6 A / 230 V AC
	AC1 operation (cos ϕ= 0.8) to EN 60947-4-1	6 A / 230 V AC
	Fluorescent lighting load according to EN 60669-1	6 A (140 uF)
	Minimum switching current at 12 V AC	100 mA
	Minimum switching current at 24 V AC	100 mA
	DC switching capacity, resistive load, at 24 V DC	6 A
Service life	Mechanical service life	> 3×10^6 cycles
	Electrical service life of switching contacts to IEC 60947-4-1:	
	AC1 (240 V/cos ϕ=0.8)	> 10^5 cycles
	AC3 (240 V/cos ϕ=0.45)	> 3×10^4 cycles
	AC5a (240 V/cos ϕ=0.45)	> 3×10^4 cycles
Switching times	Maximum output relay position changes per minute if all relays are switched.	60
	Maximum output relay position changes per minute if only one relay is switched.	120

3.3.4.4 Output, lamp load 6 A

Lamps	Incandescent lamp load	1,380 W
Fluorescent lamps	Uncompensated	1,380 W
	Parallel compensated	1,380 W
	DUO circuit	1,380 W
Low-voltage halogen lamps	Inductive transformer	1,200 W
	Electronic transformer	1,380 W
	Halogen 230 V	1,380 W
Dulux lamp	Uncompensated	1,100 W
	Parallel compensated	1,100 W
Mercury-vapor lamp	Uncompensated	1,380 W
	Parallel compensated	1,380 W
Switching capacity (switching contact)	Maximum peak inrush current I_p (150 µs)	400 A
	Maximum peak inrush current I_p (250 µs)	320 A
	Maximum peak inrush current I_p (600 µs)	200 A
Number of ballasts (T5/T8, single element)	18 W (ABB ballast 1 x 18 SF)	23
	24 W (ABB ballast T5 1 x 24 CY)	23
	36 W (ABB ballast 1 x 36 CF)	14
	58 W (ABB ballast 1 x 58 CF)	11
	80 W (Helvar EL 1 x 80 SC)	10
Energy-saving lamps	LED lamps	400 W
Rated motor power		1,380 W

Note

The peak inrush current I_p is the typical ballast load current that results during switching. Using the peak inrush current I_p, it is possible to calculate the maximum number of switchable ballasts at the Switch Actuator output for the various ballast types. The number of ballasts specified in the table can be only a sample guide value.

3.4 Switch Actuator SA/S 4.6.2.2

Fig. 4: Device illustration SA/S 4.6.2.2

The Switch Actuator is a modular installation device in pro*M* design. The device is designed for installation in electrical distribution boards and small housings for rapid mounting on a 35-mm mounting rail (to EN 60715).

The device possesses mutually independent switching relays with which the following functions can be implemented:

- Switching electric consumers (alternating or three-phase current)

The device is provided with bus voltage via the bus (ABB i-bus® KNX). The connection to the bus (ABB i-bus® KNX) is implemented using the bus connection terminal. The consumers are connected at the outputs using screw terminals (terminal designation on the housing).

The outputs can be switched manually using toggle switches.

3.4.1 Dimension drawing

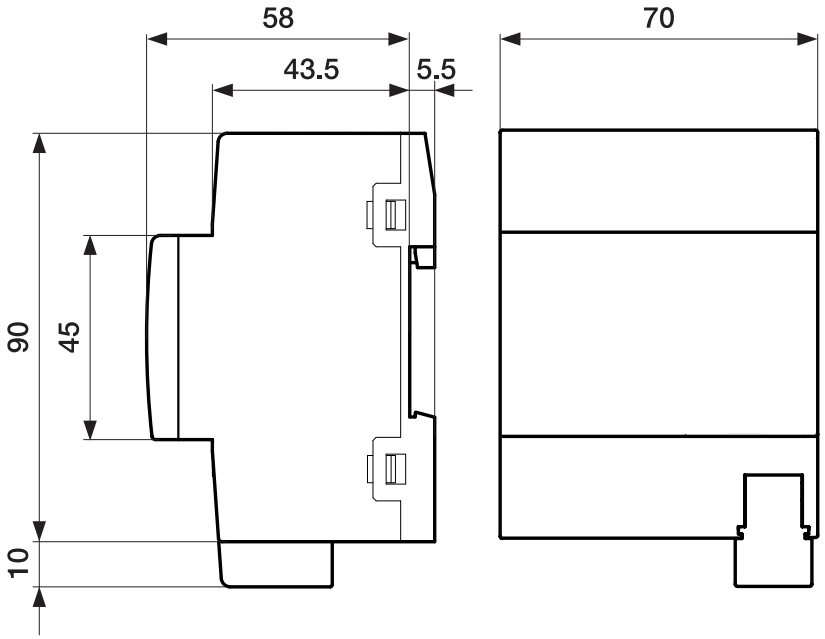

Fig. 5: Dimension drawing

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3.4.2 Connection diagram

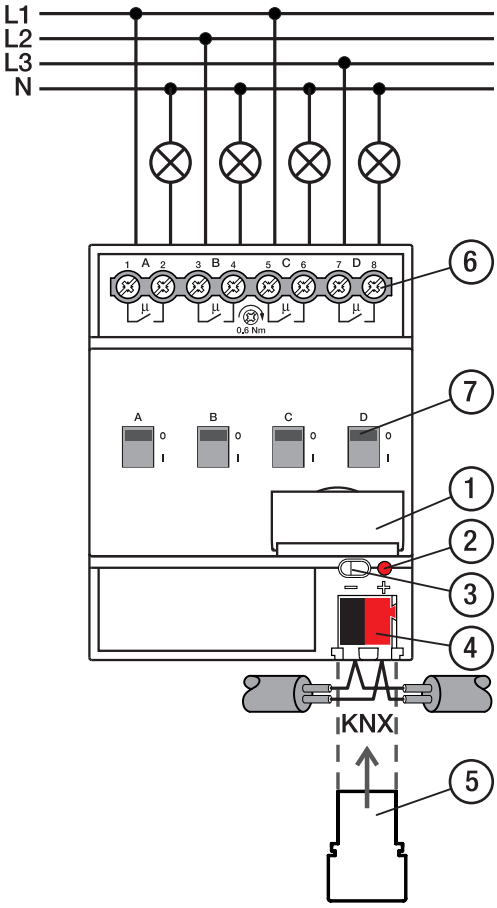

Fig. 6: Connection diagram

Legend

1 Label carriers
2 Programming LED
3 Programming button
4 Bus connection terminal
5 Cover cap
6 Load circuit, two screw terminals each
7 Contact position indication and ON/OFF actuation

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3.4.3 Operating and display elements

Button/LED	Description/function	LED indicator
 Programming	Assignment of the physical address	On: The device is in programming mode.
 Toggle switches	The toggle switches indicate the position of the contacts: closed (I), open (0). The load circuits can be switched on (I) and off (0) manually using the toggle switches.	Not available

3.4.4 Technical data

3.4.4.1 General technical data

Supply	Bus voltage	21 … 32 V DC
	Current consumption, bus	< 12 mA
	Power loss, bus	Max. 250 mW
	Power loss, device	1.2 W
Connections	KNX	Ø 0.8 mm single core (via bus connection terminal)
Connection terminals	Screw terminal	Screw terminal with universal head (PZ 1)
		0.2 … 4 mm² stranded, 2 × (0.2 … 2.5 mm²)
		0.2 … 6 mm² single core, 2 × (0.2 … 4 mm²)
	Ferrule without plastic sleeve	0.25 … 2.5 mm²
	Ferrule with plastic sleeve	0.25 … 4 mm²
	TWIN ferrules	0.5 … 2.5 mm²
	Ferrule contact pin length	Min. 10 mm
	Tightening torque	Max. 0.6 Nm
Degree of protection and protection class	Degree of protection	IP 20 to EN 60529
	Protection class	II to EN 61140
Isolation category	Overvoltage category	III to EN 60664-1
	Pollution degree	II to EN 60664-1
	Fire classification	Flammability V-0 as per UL94
SELV	KNX safety extra low voltage	SELV 24 V DC
Temperature range	Operation	–5 … +45 °C
	Transport	-25 … +70 °C
	Storage	-25 … +55 °C
Ambient conditions	Maximum air humidity	95 %, no condensation allowed
Design	Modular installation device (MDRC)	Modular installation device
	Design	pro*M*
	Housing/color	Plastic, gray
Dimensions	Dimensions	90 × 70 × 63.5 mm (H × W × D)
	Mounting width in space units	4 modules
	Mounting depth	63.5 mm
Mounting	35 mm mounting rail	To EN 60715
	Mounting position	Any
	Weight (net)	0.215 kg
Approvals	KNX certification	To EN 50090-1, -2
	CE marking	In accordance with the EMC and Low Voltage Directives

3.4.4.2 Device type

Device type	Switch Actuator	SA/S 4.6.2.2
	Application	Switch Standard 4f 6 A / …
		… = current version number of the application
	Maximum number of group objects	166
	Maximum number of group addresses	1,000
	Maximum number of assignments	1,000

Note
Observe software information on the website → www.abb.com/knx.

Note
The device supports the locking function of a KNX device in ETS. If a BCU code was assigned, the device can be read and programmed only with this BCU code.

3.4.4.3 Output, rated current 6 A

Rated values	Number of outputs	4
	U_n rated voltage	230 V AC (50/60 Hz)
	I_n rated current (per output pair)	6 A
	Maximum current per device	4 x 6 A
Switching currents	AC3 operation (cos ϕ= 0.45) to EN 60947-4-1	6 A / 230 V AC
	AC1 operation (cos ϕ= 0.8) to EN 60947-4-1	6 A / 230 V AC
	Fluorescent lighting load according to EN 60669-1	6 A (140 uF)
	Minimum switching current at 12 V AC	100 mA
	Minimum switching current at 24 V AC	100 mA
	DC switching capacity, resistive load, at 24 V DC	6 A
Service life	Mechanical service life	> 3×10^6 cycles
	Electrical service life of switching contacts to IEC 60947-4-1:	
	AC1 (240 V/cos ϕ=0.8)	> 10^5 cycles
	AC3 (240 V/cos ϕ=0.45)	> 3×10^4 cycles
	AC5a (240 V/cos ϕ=0.45)	> 3×10^4 cycles
Switching times	Maximum output relay position changes per minute if all relays are switched.	30
	Maximum output relay position changes per minute if only one relay is switched.	120

3.4.4.4 Output, lamp load 6 A

Lamps	Incandescent lamp load	1,380 W
Fluorescent lamps	Uncompensated	1,380 W
	Parallel compensated	1,380 W
	DUO circuit	1,380 W
Low-voltage halogen lamps	Inductive transformer	1,200 W
	Electronic transformer	1,380 W
	Halogen 230 V	1,380 W
Dulux lamp	Uncompensated	1,100 W
	Parallel compensated	1,100 W
Mercury-vapor lamp	Uncompensated	1,380 W
	Parallel compensated	1,380 W
Switching capacity (switching contact)	Maximum peak inrush current I_p (150 µs)	400 A
	Maximum peak inrush current I_p (250 µs)	320 A
	Maximum peak inrush current I_p (600 µs)	200 A
Number of ballasts (T5/T8, single element)	18 W (ABB ballast 1 x 18 SF)	23
	24 W (ABB ballast T5 1 x 24 CY)	23
	36 W (ABB ballast 1 x 36 CF)	14
	58 W (ABB ballast 1 x 58 CF)	11
	80 W (Helvar EL 1 x 80 SC)	10
Energy-saving lamps	LED lamps	400 W
Rated motor power		1,380 W

Note

The peak inrush current I_p is the typical ballast load current that results during switching. Using the peak inrush current I_p, it is possible to calculate the maximum number of switchable ballasts at the Switch Actuator output for the various ballast types. The number of ballasts specified in the table can be only a sample guide value.

3.5 Switch Actuator SA/S 8.6.2.2

Fig. 7: Device illustration SA/S 8.6.2.2

The Switch Actuator is a modular installation device in pro*M* design. The device is designed for installation in electrical distribution boards and small housings for rapid mounting on a 35-mm mounting rail (to EN 60715).

The device possesses mutually independent switching relays with which the following functions can be implemented:

- Switching electric consumers (alternating or three-phase current)

The device is provided with bus voltage via the bus (ABB i-bus® KNX). The connection to the bus (ABB i-bus® KNX) is implemented using the bus connection terminal. The consumers are connected at the outputs using screw terminals (terminal designation on the housing).

The outputs can be switched manually using toggle switches.

3.5.1 Dimension drawing

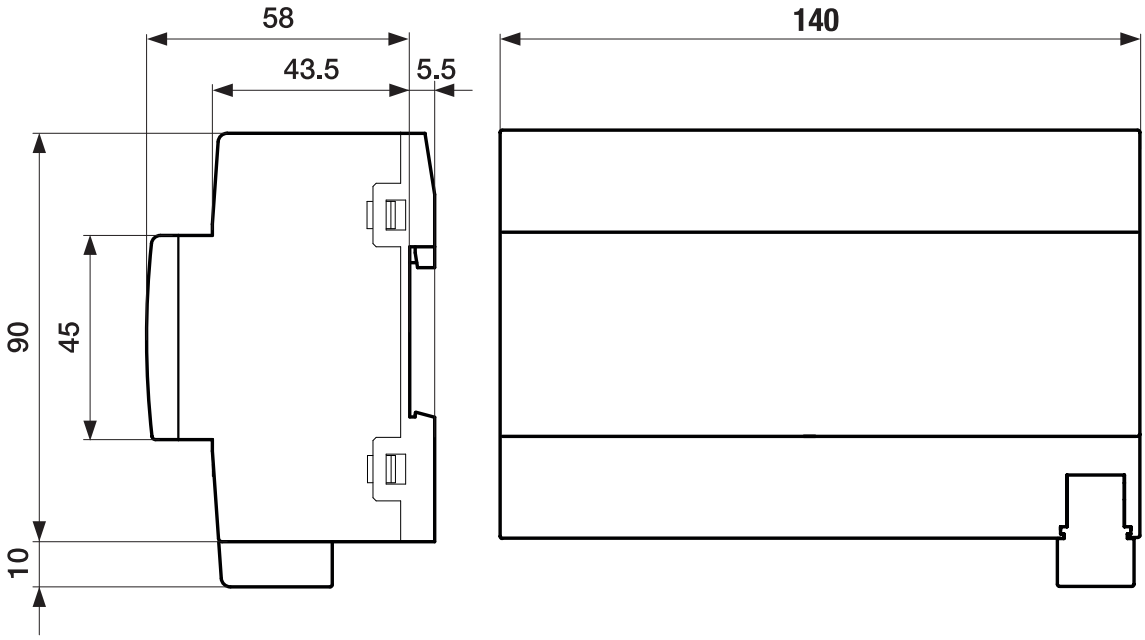

Fig. 8: Dimension drawing

3.5.2 Connection diagram

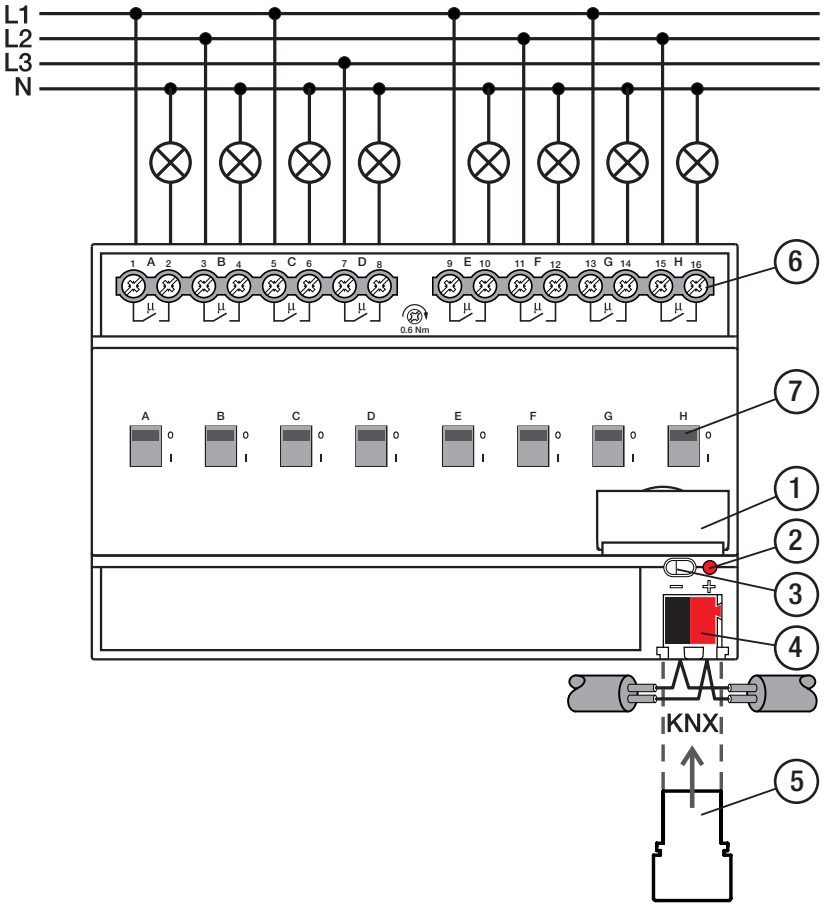

Fig. 9: Connection diagram

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Legend

1 Label carriers
2 Programming LED
3 Programming button
4 Bus connection terminal
5 Cover cap
6 Load circuit, two screw terminals each
7 Contact position indication and ON/OFF actuation

3.5.3 Operating and display elements

Button/LED	Description/function	LED indicator
 Programming	Assignment of the physical address	On: The device is in programming mode.
 Toggle switches	The toggle switches indicate the position of the contacts: closed (I), open (0). The load circuits can be switched on (I) and off (0) manually using the toggle switches.	Not available

3.5.4 Technical data

3.5.4.1 General technical data

Supply	Bus voltage	21 … 32 V DC
	Current consumption, bus	< 12 mA
	Power loss, bus	Max. 250 mW
	Power loss, device	1.5 W
Connections	KNX	Ø 0.8 mm single core (via bus connection terminal)
Connection terminals	Screw terminal	Screw terminal with universal head (PZ 1)
		0.2 … 4 mm² stranded, 2 × (0.2 … 2.5 mm²)
		0.2 … 6 mm² single core, 2 × (0.2 … 4 mm²)
	Ferrule without plastic sleeve	0.25 … 2.5 mm²
	Ferrule with plastic sleeve	0.25 … 4 mm²
	TWIN ferrules	0.5 … 2.5 mm²
	Ferrule contact pin length	Min. 10 mm
	Tightening torque	Max. 0.6 Nm
Degree of protection and protection class	Degree of protection	IP 20 to EN 60529
	Protection class	II to EN 61140
Isolation category	Overvoltage category	III to EN 60664-1
	Pollution degree	II to EN 60664-1
	Fire classification	Flammability V-0 as per UL94
SELV	KNX safety extra low voltage	SELV 24 V DC
Temperature range	Operation	–5 … +45 °C
	Transport	-25 … +70 °C
	Storage	-25 … +55 °C
Ambient conditions	Maximum air humidity	95 %, no condensation allowed
Design	Modular installation device (MDRC)	Modular installation device
	Design	pro*M*
	Housing/color	Plastic, gray
Dimensions	Dimensions	90 × 140 × 63.5 mm (H × W × D)
	Mounting width in space units	8 modules
	Mounting depth	63.5 mm
Mounting	35 mm mounting rail	To EN 60715
	Mounting position	Any
	Weight (net)	0.406 kg
Approvals	KNX certification	To EN 50090-1, -2
	CE marking	In accordance with the EMC and Low Voltage Directives

3.5.4.2 Device type

Device type	Switch Actuator	SA/S 8.6.2.2
	Application	Switch Standard 8f 6 A / …
		… = current version number of the application
	Maximum number of group objects	226
	Maximum number of group addresses	1,000
	Maximum number of assignments	1,000

Note
Observe software information on the website → www.abb.com/knx.

Note
The device supports the locking function of a KNX device in ETS. If a BCU code was assigned, the device can be read and programmed only with this BCU code.

3.5.4.3 Output, rated current 6 A

Rated values	Number of outputs	8
	U_n rated voltage	230 V AC (50/60 Hz)
	I_n rated current (per output pair)	6 A
	Maximum current per device	8 × 6 A
Switching currents	AC3 operation (cos ϕ= 0.45) according to EN 60947-4-1	6 A / 230 V AC
	AC1 operation (cos ϕ= 0.8) to EN 60947-4-1	6 A / 230 V AC
	Fluorescent lighting load according to EN 60669-1	6 A (140 uF)
	Minimum switching current at 12 V AC	100 mA
	Minimum switching current at 24 V AC	100 mA
	DC switching capacity, resistive load, at 24 V DC	6 A
Service life	Mechanical service life	> 3×10^6 cycles
	Electrical service life of switching contacts to IEC 60947-4-1:	
	AC1 (240 V/cos ϕ=0.8)	> 10^5 cycles
	AC3 (240 V/cos ϕ=0.45)	> 3×10^4 cycles
	AC5a (240 V/cos ϕ=0.45)	> 3×10^4 cycles
Switching times	Maximum output relay position changes per minute if all relays are switched.	15
	Maximum output relay position changes per minute if only one relay is switched.	120

3.5.4.4 Output, lamp load 6 A

Lamps	Incandescent lamp load	1,380 W
Fluorescent lamps	Uncompensated	1,380 W
	Parallel compensated	1,380 W
	DUO circuit	1,380 W
Low-voltage halogen lamps	Inductive transformer	1,200 W
	Electronic transformer	1,380 W
	Halogen 230 V	1,380 W
Dulux lamp	Uncompensated	1,100 W
	Parallel compensated	1,100 W
Mercury-vapor lamp	Uncompensated	1380W
	Parallel compensated	1380W
Switching capacity (switching contact)	Maximum peak inrush current I_p (150 µs)	400 A
	Maximum peak inrush current I_p (250 µs)	320 A
	Maximum peak inrush current I_p (600 µs)	200 A
Number of ballasts (T5/T8, single element)	18 W (ABB ballast 1 x 18 SF)	23
	24 W (ABB ballast T5 1 x 24 CY)	23
	36 W (ABB ballast 1 x 36 CF)	14
	58 W (ABB ballast 1 x 58 CF)	11
	80 W (Helvar EL 1 x 80 SC)	10
Energy-saving lamps	LED lamps	400 W
Rated motor power		1,380 W

Note

The peak inrush current I_p is the typical ballast load current that results during switching. Using the peak inrush current I_p, it is possible to calculate the maximum number of switchable ballasts at the Switch Actuator output for the various ballast types. The number of ballasts specified in the table can be only a sample guide value.

3.6 Switch Actuator SA/S 12.6.2.2

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Fig. 10: Device illustration SA/S 12.6.2.2

The Switch Actuator is a modular installation device in pro*M* design. The device is designed for installation in electrical distribution boards and small housings for rapid mounting on a 35-mm mounting rail (to EN 60715).

The device possesses mutually independent switching relays with which the following functions can be implemented:

- Switching electric consumers (alternating or three-phase current)

The device is provided with bus voltage via the bus (ABB i-bus® KNX). The connection to the bus (ABB i-bus® KNX) is implemented using the bus connection terminal. The consumers are connected at the outputs using screw terminals (terminal designation on the housing).

The outputs can be switched manually using toggle switches.

3.6.1 Dimension drawing

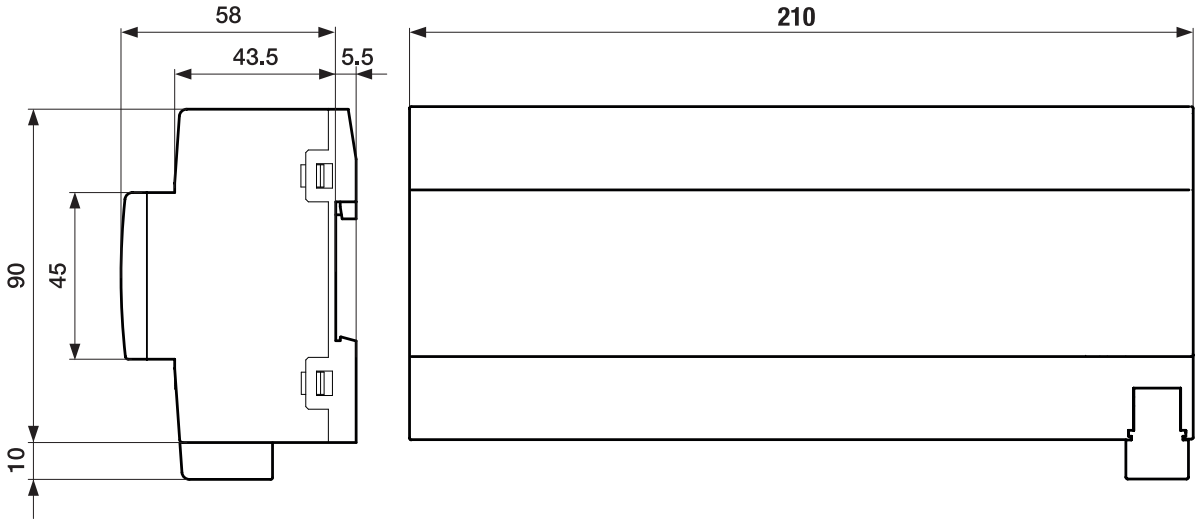

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Fig. 11: Dimension drawing

3.6.2 Connection diagram

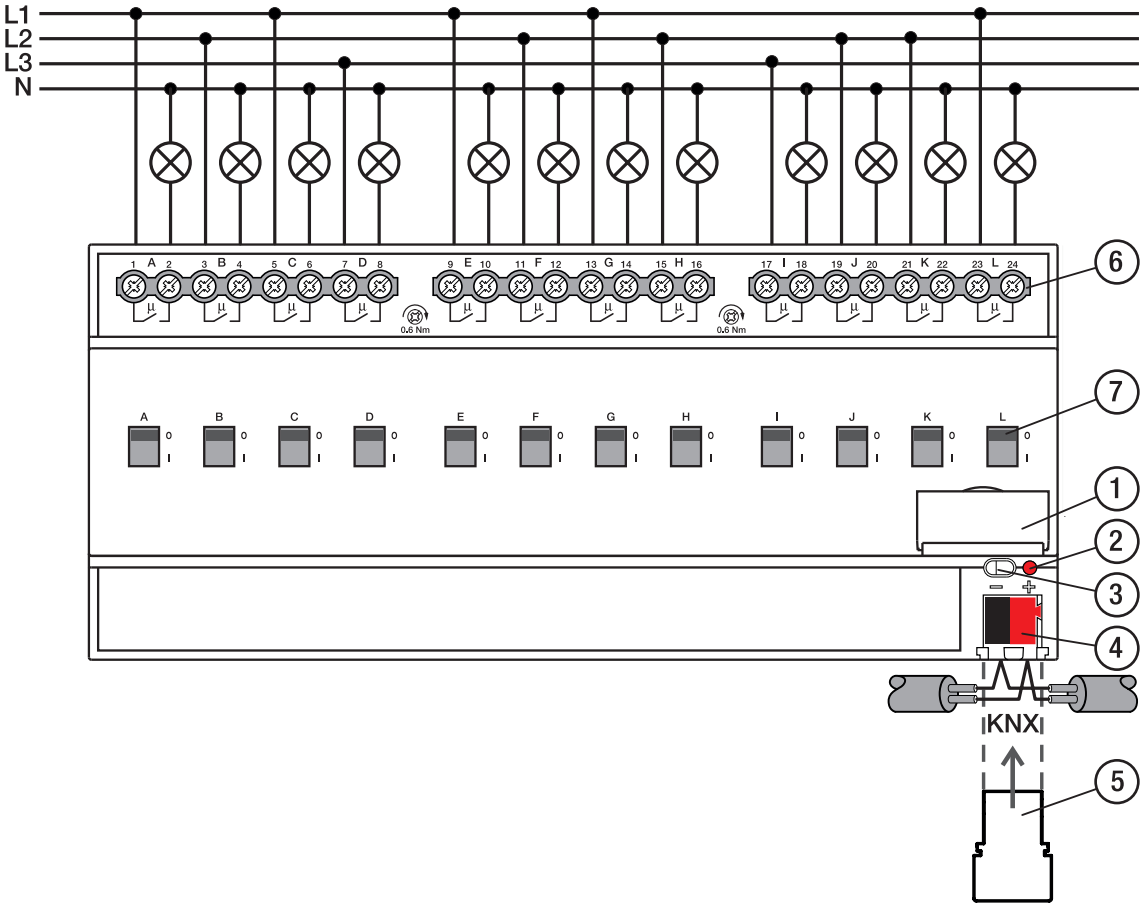

Fig. 12: Connection diagram

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Legend

1 Label carriers
2 Programming LED
3 Programming button
4 Bus connection terminal
5 Cover cap
6 Load circuit, two screw terminals each
7 Contact position indication and ON/OFF actuation

3.6.3 Operating and display elements

Button/LED	Description/function	LED indicator
 Programming	Assignment of the physical address	On: The device is in programming mode.
 Toggle switches	The toggle switches indicate the position of the contacts: closed (I), open (0). The load circuits can be switched on (I) and off (0) manually using the toggle switches.	Not available

3.6.4 Technical data

3.6.4.1 General technical data

Supply	Bus voltage	21 … 32 V DC
	Current consumption, bus	< 12 mA
	Power loss, bus	Max. 250 mW
	Power loss, device	3.9 W
Connections	KNX	Ø 0.8 mm single core (via bus connection terminal)
Connection terminals	Screw terminal	Screw terminal with universal head (PZ 1)
		0.2 … 4 mm² stranded, 2 × (0.2 … 2.5 mm²)
		0.2 … 6 mm² single core, 2 × (0.2 … 4 mm²)
	Ferrule without plastic sleeve	0.25 … 2.5 mm²
	Ferrule with plastic sleeve	0.25 … 4 mm²
	TWIN ferrules	0.5 … 2.5 mm²
	Ferrule contact pin length	Min. 10 mm
	Tightening torque	Max. 0.6 Nm
Degree of protection and protection class	Degree of protection	IP 20 to EN 60529
	Protection class	II to EN 61140
Isolation category	Overvoltage category	III to EN 60664-1
	Pollution degree	II to EN 60664-1
	Fire classification	Flammability V-0 as per UL94
SELV	KNX safety extra low voltage	SELV 24 V DC
Temperature range	Operation	–5 … +45 °C
	Transport	-25 … +70 °C
	Storage	-25 … +55 °C
Ambient conditions	Maximum air humidity	95 %, no condensation allowed
Design	Modular installation device (MDRC)	Modular installation device
	Design	pro*M*
	Housing/color	Plastic, gray
Dimensions	Dimensions	90 × 210 × 63.5 mm (H × W × D)
	Mounting width in space units	12 modules
	Mounting depth	63.5 mm
Mounting	35 mm mounting rail	To EN 60715
	Mounting position	Any
	Weight (net)	0.608 kg
Approvals	KNX certification	To EN 50090-1, -2
	CE marking	In accordance with the EMC and Low Voltage Directives

3.6.4.2 Device type

Device type	Switch Actuator	SA/S 12.6.2.2
	Application	Switch Standard 12f 6 A /…
		… = current version number of the application
	Maximum number of group objects	286
	Maximum number of group addresses	1,000
	Maximum number of assignments	1,000

Note
Observe software information on the website → www.abb.com/knx.

Note
The device supports the locking function of a KNX device in ETS. If a BCU code was assigned, the device can be read and programmed only with this BCU code.

3.6.4.3 Output, rated current 6 A

Rated values	Number of outputs	12
	U_n rated voltage	230 V AC (50/60 Hz)
	I_n rated current (per output pair)	6 A
	Maximum current per device	12 × 6 A
Switching currents	AC3 operation (cos ϕ= 0.45) according to EN 60947-4-1	6 A / 230 V AC
	AC1 operation (cos ϕ= 0.8) to EN 60947-4-1	6 A / 230 V AC
	Fluorescent lighting load according to EN 60669-1	6 A (140 uF)
	Minimum switching current at 12 V AC	100 mA
	Minimum switching current at 24 V AC	100 mA
	DC switching capacity, resistive load, at 24 V DC	6 A
Service life	Mechanical service life	> 3×10^6 cycles
	Electrical service life of switching contacts to IEC 60947-4-1:	
	AC1 (240 V/cos ϕ=0.8)	> 10^5 cycles
	AC3 (240 V/cos ϕ=0.45)	> 3×10^4 cycles
	AC5a (240 V/cos ϕ=0.45)	> 3×10^4 cycles
Switching times	Maximum output relay position changes per minute if all relays are switched.	10
	Maximum output relay position changes per minute if only one relay is switched.	120

3.6.4.4 Output, lamp load 6 A

Lamps	Incandescent lamp load	1,380 W
Fluorescent lamps	Uncompensated	1,380 W
	Parallel compensated	1,380 W
	DUO circuit	1,380 W
Low-voltage halogen lamps	Inductive transformer	1,200 W
	Electronic transformer	1,380 W
	Halogen 230 V	1,380 W
Dulux lamp	Uncompensated	1,100 W
	Parallel compensated	1,100 W
Mercury-vapor lamp	Uncompensated	1380W
	Parallel compensated	1380W
Switching capacity (switching contact)	Maximum peak inrush current I_p (150 µs)	400 A
	Maximum peak inrush current I_p (250 µs)	320 A
	Maximum peak inrush current I_p (600 µs)	200 A
Number of ballasts (T5/T8, single element)	18 W (ABB ballast 1 x 18 SF)	23
	24 W (ABB ballast T5 1 x 24 CY)	23
	36 W (ABB ballast 1 x 36 CF)	14
	58 W (ABB ballast 1 x 58 CF)	11
	80 W (Helvar EL 1 x 80 SC)	10
Energy-saving lamps	LED lamps	400 W
Rated motor power		1,380 W

Note

The peak inrush current I_p is the typical ballast load current that results during switching. Using the peak inrush current I_p, it is possible to calculate the maximum number of switchable ballasts at the Switch Actuator output for the various ballast types. The number of ballasts specified in the table can be only a sample guide value.

3.7 Switch Actuator SA/S 2.10.2.2

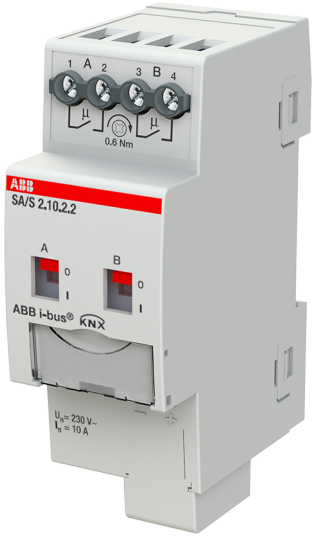

Fig. 13: Device illustration SA/S 2.10.2.2

The Switch Actuator is a modular installation device in pro*M* design. The device is designed for installation in electrical distribution boards and small housings for rapid mounting on a 35-mm mounting rail (to EN 60715).

The device possesses mutually independent switching relays with which the following functions can be implemented:

- Switching electric consumers (alternating or three-phase current)

The device is provided with bus voltage via the bus (ABB i-bus® KNX). The connection to the bus (ABB i-bus® KNX) is implemented using the bus connection terminal. The consumers are connected at the outputs using screw terminals (terminal designation on the housing).

The outputs can be switched manually using toggle switches.

3.7.1 Dimension drawing

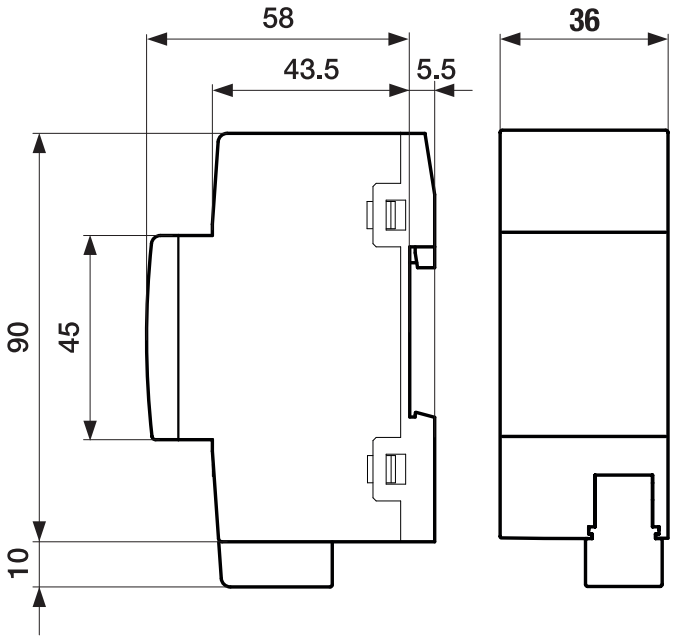

Fig. 14: Dimension drawing

3.7.2 Connection diagram

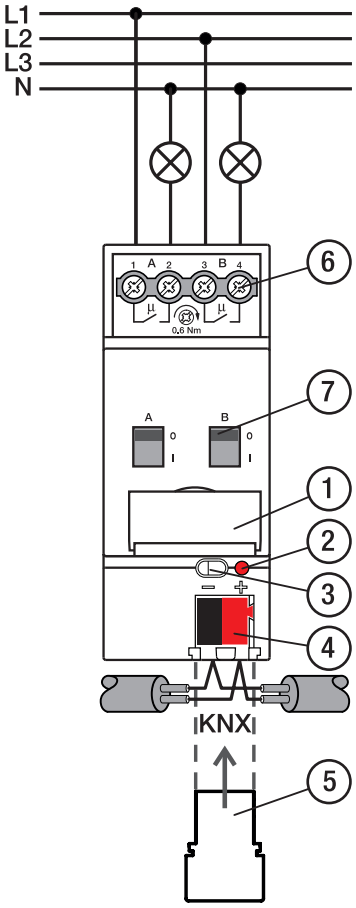

Fig. 15: Connection diagram

Legend

1 Label carriers
2 Programming LED
3 Programming button
4 Bus connection terminal
5 Cover cap
6 Load circuit, two screw terminals each
7 Contact position indication and ON/OFF actuation

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3.7.3 Operating and display elements

Button/LED	Description/function	LED indicator
 Programming	Assignment of the physical address	On: The device is in programming mode.
 Toggle switches	The toggle switches indicate the position of the contacts: closed (I), open (0). The load circuits can be switched on (I) and off (0) manually using the toggle switches.	Not available

3.7.4 Technical data

3.7.4.1 General technical data

Supply	Bus voltage	21 … 32 V DC
	Current consumption, bus	< 12 mA
	Power loss, bus	Max. 250 mW
	Power loss, device	1.5 W
Connections	KNX	Ø 0.8 mm single core (via bus connection terminal)
Connection terminals	Screw terminal	Screw terminal with universal head (PZ 1)
		0.2 … 4 mm² stranded, 2 × (0.2 … 2.5 mm²)
		0.2 … 6 mm² single core, 2 × (0.2 … 4 mm²)
	Ferrule without plastic sleeve	0.25 … 2.5 mm²
	Ferrule with plastic sleeve	0.25 … 4 mm²
	TWIN ferrules	0.5 … 2.5 mm²
	Ferrule contact pin length	Min. 10 mm
	Tightening torque	Max. 0.6 Nm
Degree of protection and protection class	Degree of protection	IP 20 to EN 60529
	Protection class	II to EN 61140
Isolation category	Overvoltage category	III to EN 60664-1
	Pollution degree	II to EN 60664-1
	Fire classification	Flammability V-0 as per UL94
SELV	KNX safety extra low voltage	SELV 24 V DC
Temperature range	Operation	–5 … +45 °C
	Transport	-25 … +70 °C
	Storage	-25 … +55 °C
Ambient conditions	Maximum air humidity	95 %, no condensation allowed
Design	Modular installation device (MDRC)	Modular installation device
	Design	pro*M*
	Housing/color	Plastic, gray
Dimensions	Dimensions	90 x 36 x 63.5 mm (H x W x D)
	Mounting width in space units	2 modules
	Mounting depth	63.5 mm
Mounting	35 mm mounting rail	To EN 60715
	Mounting position	Any
	Weight (net)	0.13 kg
Approvals	KNX certification	To EN 50090-1, -2
	CE marking	In accordance with the EMC and Low Voltage Directives

3.7.4.2 Device type

Device type	Switch Actuator	SA/S 2.10.2.2
	Application	Switch Standard 2f 10 A / …
		… = current version number of the application
	Maximum number of group objects	136
	Maximum number of group addresses	1,000
	Maximum number of assignments	1,000

Note
Observe software information on the website → www.abb.com/knx.

Note
The device supports the locking function of a KNX device in ETS. If a BCU code was assigned, the device can be read and programmed only with this BCU code.

3.7.4.3 Output, rated current 10 A

Rated values	Number of outputs	2
	U_n rated voltage	230 V AC (50/60 Hz)
	I_n rated current (per output pair)	6 A
	Maximum current per device	2 x 10 A
Switching currents	AC3 operation (cos ϕ= 0.45) to EN 60947-4-1	8 A / 230 V AC
	AC1 operation (cos ϕ= 0.8) to EN 60947-4-1	10 A / 230 V AC
	Fluorescent lighting load according to EN 60669-1	6 A (140 uF)
	Minimum switching current at 12 V AC	100 mA
	Minimum switching current at 24 V AC	100 mA
	DC switching capacity, resistive load, at 24 V DC	10 A
Service life	Mechanical service life	> 3×10^6 cycles
	Electrical service life of switching contacts to IEC 60947-4-1:	
	AC1 (240 V/cos ϕ=0.8)	> 10^5 cycles
	AC3 (240 V/cos ϕ=0.45)	> 3×10^4 cycles
	AC5a (240 V/cos ϕ=0.45)	> 3×10^4 cycles
Switching times	Maximum output relay position changes per minute if all relays are switched.	60
	Maximum output relay position changes per minute if only one relay is switched.	120

3.7.4.4 Output, lamp load 10 A

Lamps	Incandescent lamp load	2,500 W
Fluorescent lamps	Uncompensated	2,500 W
	Parallel compensated	1,500 W
	DUO circuit	1,500 W
Low-voltage halogen lamps	Inductive transformer	1,200 W
	Electronic transformer	1,500 W
	Halogen 230 V	2,500 W
Dulux lamp	Uncompensated	1,100 W
	Parallel compensated	1,100 W
Mercury-vapor lamp	Uncompensated	2,000 W
	Parallel compensated	2,000 W
Switching capacity (switching contact)	Maximum peak inrush current I_p (150 µs)	400 A
	Maximum peak inrush current I_p (250 µs)	320 A
	Maximum peak inrush current I_p (600 µs)	200 A
Number of ballasts (T5/T8, single element)	18 W (ABB ballast 1 x 18 SF)	23
	24 W (ABB ballast T5 1 x 24 CY)	23
	36 W (ABB ballast 1 x 36 CF)	14
	58 W (ABB ballast 1 x 58 CF)	11
	80 W (Helvar EL 1 x 80 SC)	10
Energy-saving lamps	LED lamps	400 W
Rated motor power		1,840 W

Note

The peak inrush current I_p is the typical ballast load current that results during switching. Using the peak inrush current I_p, it is possible to calculate the maximum number of switchable ballasts at the Switch Actuator output for the various ballast types. The number of ballasts specified in the table can be only a sample guide value.

3.8 Switch Actuator SA/S 4.10.2.2

Fig. 16: Device illustration SA/S 4.10.2.2

The Switch Actuator is a modular installation device in pro*M* design. The device is designed for installation in electrical distribution boards and small housings for rapid mounting on a 35-mm mounting rail (to EN 60715).

The device possesses mutually independent switching relays with which the following functions can be implemented:

- Switching electric consumers (alternating or three-phase current)

The device is provided with bus voltage via the bus (ABB i-bus® KNX). The connection to the bus (ABB i-bus® KNX) is implemented using the bus connection terminal. The consumers are connected at the outputs using screw terminals (terminal designation on the housing).

The outputs can be switched manually using toggle switches.

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3.8.1 Dimension drawing

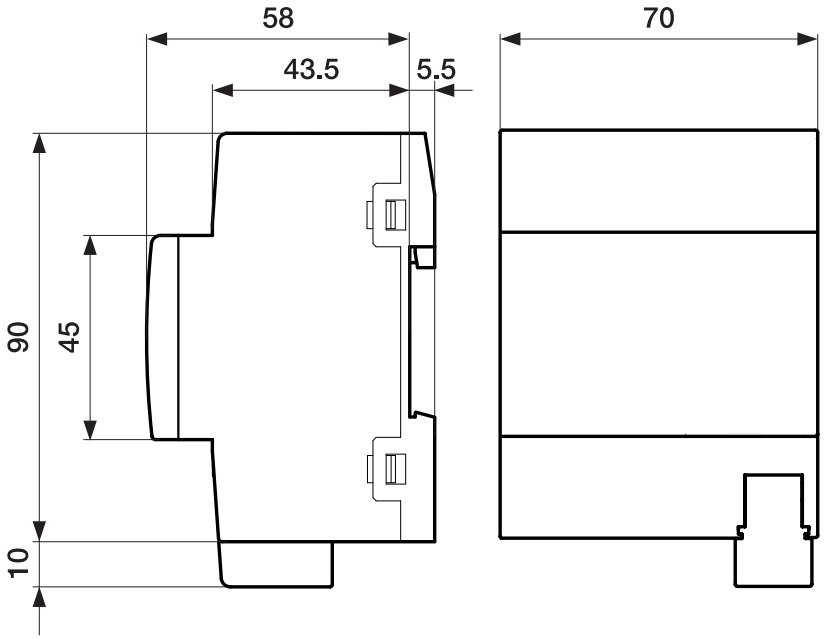

Fig. 17: Dimension drawing

3.8.2 Connection diagram

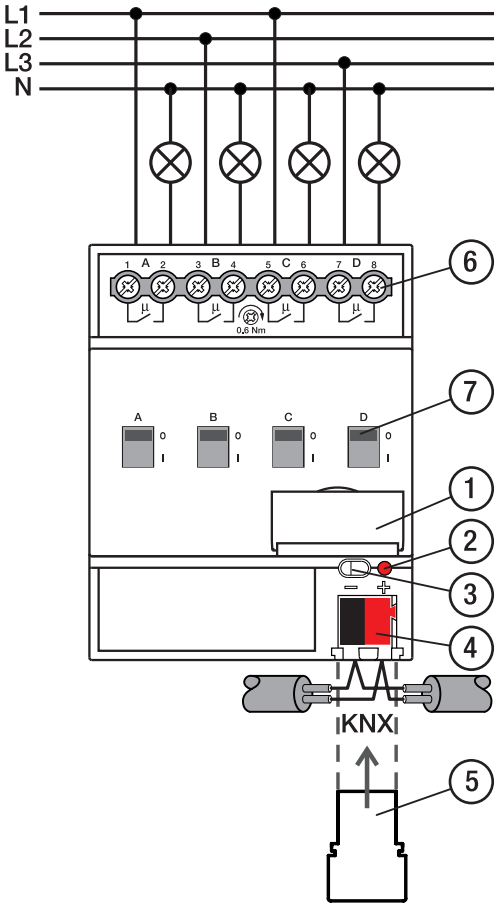

Fig. 18: Connection diagram

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Legend

1 Label carriers
2 Programming LED
3 Programming button
4 Bus connection terminal
5 Cover cap
6 Load circuit, two screw terminals each
7 Contact position indication and ON/OFF actuation

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3.8.3 Operating and display elements

Button/LED	Description/function	LED indicator
 Programming	Assignment of the physical address	On: The device is in programming mode.
 Toggle switches	The toggle switches indicate the position of the contacts: closed (I), open (0). The load circuits can be switched on (I) and off (0) manually using the toggle switches.	Not available

3.8.4 Technical data

3.8.4.1 General technical data

Supply	Bus voltage	21 … 32 V DC
	Current consumption, bus	< 12 mA
	Power loss, bus	Max. 250 mW
	Power loss, device	2.0 W
Connections	KNX	Ø 0.8 mm single core (via bus connection terminal)
Connection terminals	Screw terminal	Screw terminal with universal head (PZ 1)
		0.2 … 4 mm² stranded, 2 × (0.2 … 2.5 mm²)
		0.2 … 6 mm² single core, 2 × (0.2 … 4 mm²)
	Ferrule without plastic sleeve	0.25 … 2.5 mm²
	Ferrule with plastic sleeve	0.25 … 4 mm²
	TWIN ferrules	0.5 … 2.5 mm²
	Ferrule contact pin length	Min. 10 mm
	Tightening torque	Max. 0.6 Nm
Degree of protection and protection class	Degree of protection	IP 20 to EN 60529
	Protection class	II to EN 61140
Isolation category	Overvoltage category	III to EN 60664-1
	Pollution degree	II to EN 60664-1
	Fire classification	Flammability V-0 as per UL94
SELV	KNX safety extra low voltage	SELV 24 V DC
Temperature range	Operation	–5 … +45 °C
	Transport	-25 … +70 °C
	Storage	-25 … +55 °C
Ambient conditions	Maximum air humidity	95 %, no condensation allowed
Design	Modular installation device (MDRC)	Modular installation device
	Design	pro*M*
	Housing/color	Plastic, gray
Dimensions	Dimensions	90 x 70 x 63.5 mm (H x W x D)
	Mounting width in space units	4 modules
	Mounting depth	63.5 mm
Mounting	35 mm mounting rail	To EN 60715
	Mounting position	Any
	Weight (net)	0.215 kg
Approvals	KNX certification	To EN 50090-1, -2
	CE marking	In accordance with the EMC and Low Voltage Directives

3.8.4.2 Device type

Device type	Switch Actuator	SA/S 4.10.2.2
	Application	Switch Standard 4f 10 A / …
		… = current version number of the application
	Maximum number of group objects	166
	Maximum number of group addresses	1,000
	Maximum number of assignments	1,000

Note
Observe software information on the website → www.abb.com/knx.

Note
The device supports the locking function of a KNX device in ETS. If a BCU code was assigned, the device can be read and programmed only with this BCU code.

3.8.4.3 Output, rated current 10 A

Rated values	Number of outputs	4
	U_n rated voltage	230 V AC (50/60 Hz)
	I_n rated current (per output pair)	10 A
	Maximum current per device	4 x 10 A
Switching currents	AC3 operation (cos ϕ= 0.45) to EN 60947-4-1	8 A / 230V AC
	AC1 operation (cos ϕ= 0.8) to EN 60947-4-1	10 A / 230V AC
	Fluorescent lighting load according to EN 60669-1	10 A (140 uF)
	Minimum switching current at 12 V AC	100 mA
	Minimum switching current at 24 V AC	100 mA
	DC switching capacity, resistive load, at 24 V DC	10 A
Service life	Mechanical service life	> 3×10^6 cycles
	Electrical service life of switching contacts to IEC 60947-4-1:	
	AC1 (240 V/cos ϕ=0.8)	> 10^5 cycles
	AC3 (240 V/cos ϕ=0.45)	> 3×10^4 cycles
	AC5a (240 V/cos ϕ=0.45)	> 3×10^4 cycles
Switching times	Maximum output relay position changes per minute if all relays are switched.	30
	Maximum output relay position changes per minute if only one relay is switched.	120

3.8.4.4 Output, lamp load 10 A

Lamps	Incandescent lamp load	2,500 W
Fluorescent lamps	Uncompensated	2,500 W
	Parallel compensated	1,500 W
	DUO circuit	1,500 W
Low-voltage halogen lamps	Inductive transformer	1,200 W
	Electronic transformer	1,500 W
	Halogen 230 V	2,500 W
Dulux lamp	Uncompensated	1,100 W
	Parallel compensated	1,100 W
Mercury-vapor lamp	Uncompensated	2,000 W
	Parallel compensated	2,000 W
Switching capacity (switching contact)	Maximum peak inrush current I_p (150 µs)	400 A
	Maximum peak inrush current I_p (250 µs)	320 A
	Maximum peak inrush current I_p (600 µs)	200 A
Number of ballasts (T5/T8, single element)	18 W (ABB ballast 1 x 18 SF)	23
	24 W (ABB ballast T5 1 x 24 CY)	23
	36 W (ABB ballast 1 x 36 CF)	14
	58 W (ABB ballast 1 x 58 CF)	11
	80 W (Helvar EL 1 x 80 SC)	10
Energy-saving lamps	LED lamps	400 W
Rated motor power		1,840 W

Note

The peak inrush current I_p is the typical ballast load current that results during switching. Using the peak inrush current I_p, it is possible to calculate the maximum number of switchable ballasts at the Switch Actuator output for the various ballast types. The number of ballasts specified in the table can be only a sample guide value.

3.9 Switch Actuator SA/S 8.10.2.2

Fig. 19: Device illustration SA/S 8.10.2.2

The Switch Actuator is a modular installation device in pro*M* design. The device is designed for installation in electrical distribution boards and small housings for rapid mounting on a 35-mm mounting rail (to EN 60715).

The device possesses mutually independent switching relays with which the following functions can be implemented:

- Switching electric consumers (alternating or three-phase current)

The device is provided with bus voltage via the bus (ABB i-bus® KNX). The connection to the bus (ABB i-bus® KNX) is implemented using the bus connection terminal. The consumers are connected at the outputs using screw terminals (terminal designation on the housing).

The outputs can be switched manually using toggle switches.

3.9.1 Dimension drawing

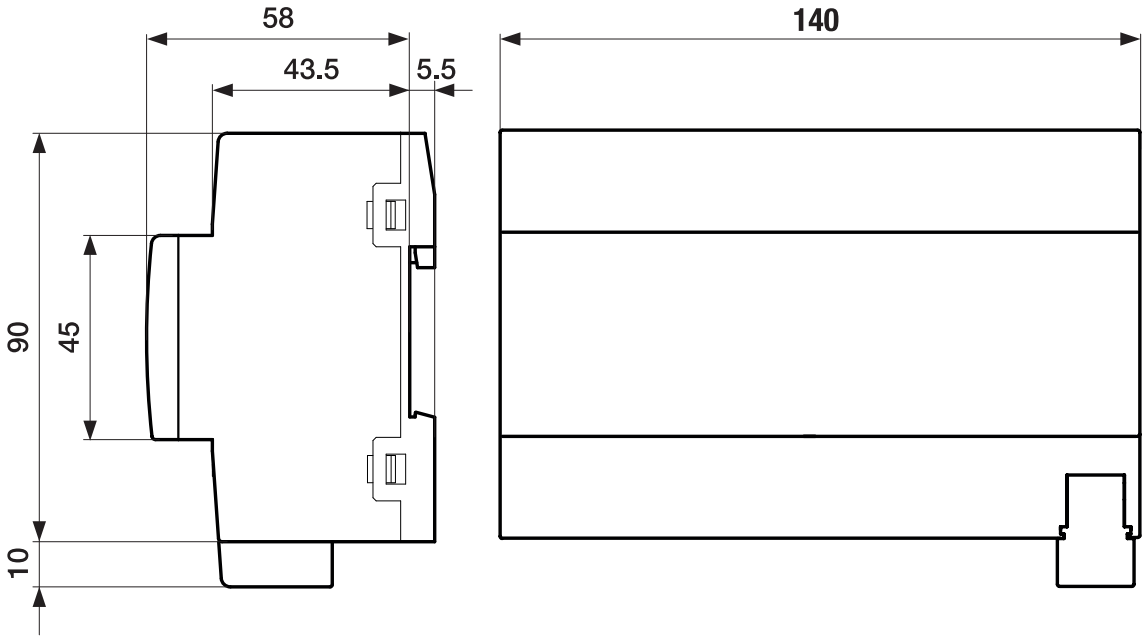

Fig. 20: Dimension drawing

3.9.2 Connection diagram

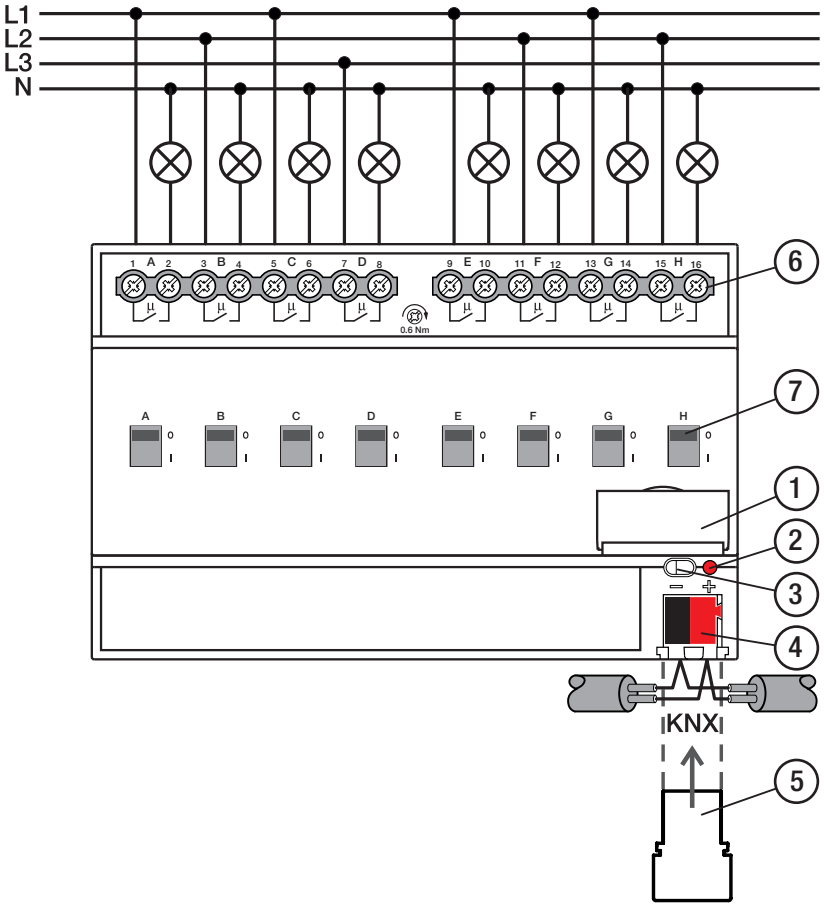

Fig. 21: Connection diagram

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Legend

1 Label carriers
2 Programming LED
3 Programming button
4 Bus connection terminal
5 Cover cap
6 Load circuit, two screw terminals each
7 Contact position indication and ON/OFF actuation

3.9.3 Operating and display elements

Button/LED	Description/function	LED indicator
 Programming	Assignment of the physical address	On: The device is in programming mode.
 Toggle switches	The toggle switches indicate the position of the contacts: closed (I), open (0). The load circuits can be switched on (I) and off (0) manually using the toggle switches.	Not available

3.9.4 Technical data

3.9.4.1 General technical data

Supply	Bus voltage	21 … 32 V DC
	Current consumption, bus	< 12 mA
	Power loss, bus	Max. 250 mW
	Power loss, device	2.5 W
Connections	KNX	Ø 0.8 mm single core (via bus connection terminal)
Connection terminals	Screw terminal	Screw terminal with universal head (PZ 1)
		0.2 … 4 mm² stranded, 2 × (0.2 … 2.5 mm²)
		0.2 … 6 mm² single core, 2 × (0.2 … 4 mm²)
	Ferrule without plastic sleeve	0.25 … 2.5 mm²
	Ferrule with plastic sleeve	0.25 … 4 mm²
	TWIN ferrules	0.5 … 2.5 mm²
	Ferrule contact pin length	Min. 10 mm
	Tightening torque	Max. 0.6 Nm
Degree of protection and protection class	Degree of protection	IP 20 to EN 60529
	Protection class	II to EN 61140
Isolation category	Overvoltage category	III to EN 60664-1
	Pollution degree	II to EN 60664-1
	Fire classification	Flammability V-0 as per UL94
SELV	KNX safety extra low voltage	SELV 24 V DC
Temperature range	Operation	–5 … +45 °C
	Transport	-25 … +70 °C
	Storage	-25 … +55 °C
Ambient conditions	Maximum air humidity	95 %, no condensation allowed
Design	Modular installation device (MDRC)	Modular installation device
	Design	pro*M*
	Housing/color	Plastic, gray
Dimensions	Dimensions	90 x 140 x 63.5 mm (H x W x D)
	Mounting width in space units	8 modules
	Mounting depth	63.5 mm
Mounting	35 mm mounting rail	To EN 60715
	Mounting position	Any
	Weight (net)	0.406 kg
Approvals	KNX certification	To EN 50090-1, -2
	CE marking	In accordance with the EMC and Low Voltage Directives

3.9.4.2 Device type

Device type	Switch Actuator	SA/S 8.10.2.2
	Application	Switch Standard 8f 10 A / …
		… = current version number of the application
	Maximum number of group objects	226
	Maximum number of group addresses	1,000
	Maximum number of assignments	1,000

Note
Observe software information on the website → www.abb.com/knx.

Note
The device supports the locking function of a KNX device in ETS. If a BCU code was assigned, the device can be read and programmed only with this BCU code.

3.9.4.3 Output, rated current 10 A

Rated values	Number of outputs	8
	U_n rated voltage	230 V AC (50/60 Hz)
	I_n rated current (per output pair)	10 A
	Maximum current per device	8 x 10 A
Switching currents	AC3 operation (cos ϕ= 0.45) to EN 60947-4-1	8 A / 230 V AC
	AC1 operation (cos ϕ= 0.8) to EN 60947-4-1	10 A / 230 V AC
	Fluorescent lighting load according to EN 60669-1	10 A (140 uF)
	Minimum switching current at 12 V AC	100 mA
	Minimum switching current at 24 V AC	100 mA
	DC switching capacity, resistive load, at 24 V DC	10 A
Service life	Mechanical service life	> 3×10^6 cycles
	Electrical service life of switching contacts to IEC 60947-4-1:	
	AC1 (240 V/cos ϕ=0.8)	> 10^5 cycles
	AC3 (240 V/cos ϕ=0.45)	> 3×10^4 cycles
	AC5a (240 V/cos ϕ=0.45)	> 3×10^4 cycles
Switching times	Maximum output relay position changes per minute if all relays are switched.	15
	Maximum output relay position changes per minute if only one relay is switched.	120

3.9.4.4 Output, lamp load 10 A

Lamps	Incandescent lamp load	2,500 W
Fluorescent lamps	Uncompensated	2,500 W
	Parallel compensated	1,500 W
	DUO circuit	1,500 W
Low-voltage halogen lamps	Inductive transformer	1,200 W
	Electronic transformer	1,500 W
	Halogen 230 V	2,500 W
Dulux lamp	Uncompensated	1,100 W
	Parallel compensated	1,100 W
Mercury-vapor lamp	Uncompensated	2,000 W
	Parallel compensated	2,000 W
Switching capacity (switching contact)	Maximum peak inrush current I_p (150 µs)	400 A
	Maximum peak inrush current I_p (250 µs)	320 A
	Maximum peak inrush current I_p (600 µs)	200 A
Number of ballasts (T5/T8, single element)	18 W (ABB ballast 1 x 18 SF)	23
	24 W (ABB ballast T5 1 x 24 CY)	23
	36 W (ABB ballast 1 x 36 CF)	14
	58 W (ABB ballast 1 x 58 CF)	11
	80 W (Helvar EL 1 x 80 SC)	10
Energy-saving lamps	LED lamps	400 W
Rated motor power		1,840 W

Note

The peak inrush current I_p is the typical ballast load current that results during switching. Using the peak inrush current I_p, it is possible to calculate the maximum number of switchable ballasts at the Switch Actuator output for the various ballast types. The number of ballasts specified in the table can be only a sample guide value.

3.10 Switch Actuator SA/S 12.10.2.2

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Fig. 22: Device illustration SA/S 12.10.2.2

The Switch Actuator is a modular installation device in pro*M* design. The device is designed for installation in electrical distribution boards and small housings for rapid mounting on a 35-mm mounting rail (to EN 60715).

The device possesses mutually independent switching relays with which the following functions can be implemented:

- Switching electric consumers (alternating or three-phase current)

The device is provided with bus voltage via the bus (ABB i-bus® KNX). The connection to the bus (ABB i-bus® KNX) is implemented using the bus connection terminal. The consumers are connected at the outputs using screw terminals (terminal designation on the housing).

The outputs can be switched manually using toggle switches.

3.10.1 Dimension drawing

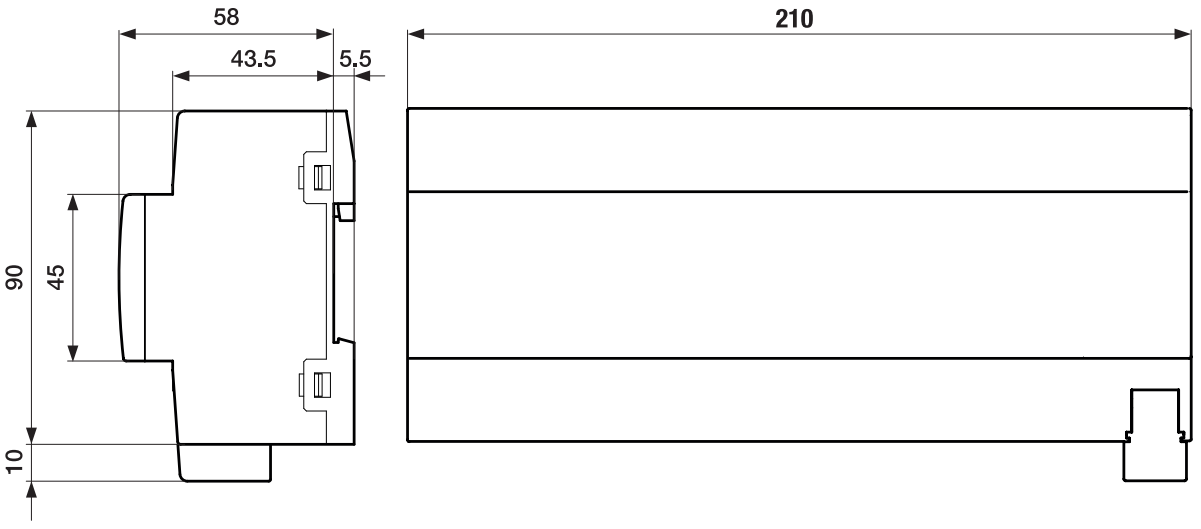

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Fig. 23: Dimension drawing

3.10.2 Connection diagram

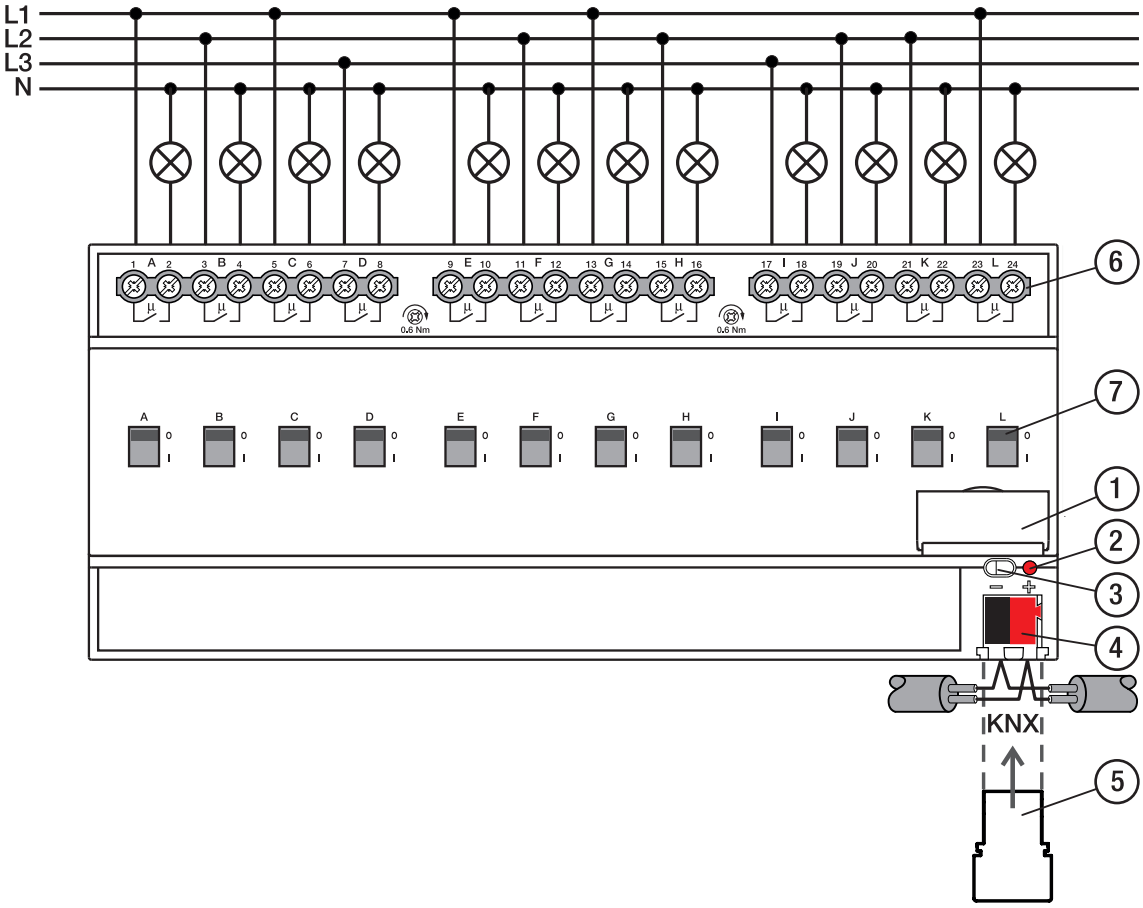

Fig. 24: Connection diagram

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Legend

1 Label carriers
2 Programming LED
3 Programming button
4 Bus connection terminal
5 Cover cap
6 Load circuit, two screw terminals each
7 Contact position indication and ON/OFF actuation

3.10.3 Operating and display elements

Button/LED	Description/function	LED indicator
 Programming	Assignment of the physical address	On: The device is in programming mode.
 Toggle switches	The toggle switches indicate the position of the contacts: closed (I), open (0). The load circuits can be switched on (I) and off (0) manually using the toggle switches.	Not available

3.10.4 Technical data

3.10.4.1 General technical data

Supply	Bus voltage	21 … 32 V DC
	Current consumption, bus	< 12 mA
	Power loss, bus	Max. 250 mW
	Power loss, device	6.5 W
Connections	KNX	Ø 0.8 mm single core (via bus connection terminal)
Connection terminals	Screw terminal	Screw terminal with universal head (PZ 1)
		0.2 … 4 mm² stranded, 2 × (0.2 … 2.5 mm²)
		0.2 … 6 mm² single core, 2 × (0.2 … 4 mm²)
	Ferrule without plastic sleeve	0.25 … 2.5 mm²
	Ferrule with plastic sleeve	0.25 … 4 mm²
	TWIN ferrules	0.5 … 2.5 mm²
	Ferrule contact pin length	Min. 10 mm
	Tightening torque	Max. 0.6 Nm
Degree of protection and protection class	Degree of protection	IP 20 to EN 60529
	Protection class	II to EN 61140
Isolation category	Overvoltage category	III to EN 60664-1
	Pollution degree	II to EN 60664-1
	Fire classification	Flammability V-0 as per UL94
SELV	KNX safety extra low voltage	SELV 24 V DC
Temperature range	Operation	–5 … +45 °C
	Transport	-25 … +70 °C
	Storage	-25 … +55 °C
Ambient conditions	Maximum air humidity	95 %, no condensation allowed
Design	Modular installation device (MDRC)	Modular installation device
	Design	pro*M*
	Housing/color	Plastic, gray
Dimensions	Dimensions	90 x 210 x 63.5 mm (H x W x D)
	Mounting width in space units	12 modules
	Mounting depth	63.5 mm
Mounting	35 mm mounting rail	To EN 60715
	Mounting position	Any
	Weight (net)	0.608 kg
Approvals	KNX certification	To EN 50090-1, -2
	CE marking	In accordance with the EMC and Low Voltage Directives

3.10.4.2 Device type

Device type	Switch Actuator	SA/S 12.10.2.2
	Application	Switch Standard 12f 10 A / …
		… = current version number of the application
	Maximum number of group objects	286
	Maximum number of group addresses	1,000
	Maximum number of assignments	1,000

Note
Observe software information on the website → www.abb.com/knx.

Note
The device supports the locking function of a KNX device in ETS. If a BCU code was assigned, the device can be read and programmed only with this BCU code.

3.10.4.3 Output, rated current 10 A

Rated values	Number of outputs	12
	U_n rated voltage	230 V AC (50/60 Hz)
	I_n rated current (per output pair)	10 A
	Maximum current per device	12 x 10 A
Switching currents	AC3 operation (cos ϕ= 0.45) to EN 60947-4-1	8 A / 230 V AC
	AC1 operation (cos ϕ= 0.8) to EN 60947-4-1	10 A / 230 V AC
	Fluorescent lighting load according to EN 60669-1	10 A (140 uF)
	Minimum switching current at 12 V AC	100 mA
	Minimum switching current at 24 V AC	100 mA
	DC switching capacity, resistive load, at 24 V DC	10 A
Service life	Mechanical service life	> 3×10^6 cycles
	Electrical service life of switching contacts to IEC 60947-4-1:	
	AC1 (240 V/cos ϕ=0.8)	> 10^5 cycles
	AC3 (240 V/cos ϕ=0.45)	> 3×10^4 cycles
	AC5a (240 V/cos ϕ=0.45)	> 3×10^4 cycles
Switching times	Maximum output relay position changes per minute if all relays are switched.	10
	Maximum output relay position changes per minute if only one relay is switched.	120

3.10.4.4 Output, lamp load 10 A

Lamps	Incandescent lamp load	2,500 W
Fluorescent lamps	Uncompensated	2,500 W
	Parallel compensated	1,500 W
	DUO circuit	1,500 W
Low-voltage halogen lamps	Inductive transformer	1,200 W
	Electronic transformer	1,500 W
	Halogen 230 V	2,500 W
Dulux lamp	Uncompensated	1,100 W
	Parallel compensated	1,100 W
Mercury-vapor lamp	Uncompensated	2,000 W
	Parallel compensated	2,000 W
Switching capacity (switching contact)	Maximum peak inrush current I_p (150 µs)	400 A
	Maximum peak inrush current I_p (250 µs)	320 A
	Maximum peak inrush current I_p (600 µs)	200 A
Number of ballasts (T5/T8, single element)	18 W (ABB ballast 1 x 18 SF)	23
	24 W (ABB ballast T5 1 x 24 CY)	23
	36 W (ABB ballast 1 x 36 CF)	14
	58 W (ABB ballast 1 x 58 CF)	11
	80 W (Helvar EL 1 x 80 SC)	10
Energy-saving lamps	LED lamps	400 W
Rated motor power		1,840 W

Note

The peak inrush current I_p is the typical ballast load current that results during switching. Using the peak inrush current I_p, it is possible to calculate the maximum number of switchable ballasts at the Switch Actuator output for the various ballast types. The number of ballasts specified in the table can be only a sample guide value.

3.11 Switch Actuator SA/S 2.16.2.2

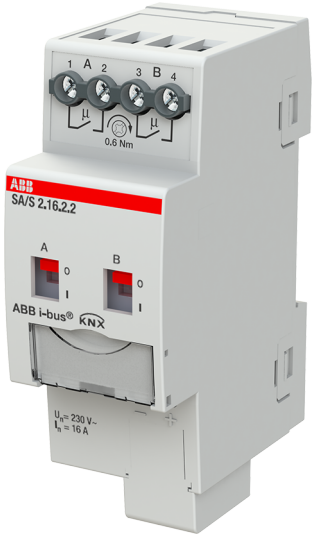

Fig. 25: Device illustration SA/S 2.16.2.2

The Switch Actuator is a modular installation device in pro*M* design. The device is designed for installation in electrical distribution boards and small housings for rapid mounting on a 35-mm mounting rail (to EN 60715).

The device possesses mutually independent switching relays with which the following functions can be implemented:

- Switching electric consumers (alternating or three-phase current)

The device is provided with bus voltage via the bus (ABB i-bus® KNX). The connection to the bus (ABB i-bus® KNX) is implemented using the bus connection terminal. The consumers are connected at the outputs using screw terminals (terminal designation on the housing).

The outputs can be switched manually using toggle switches.

3.11.1 Dimension drawing

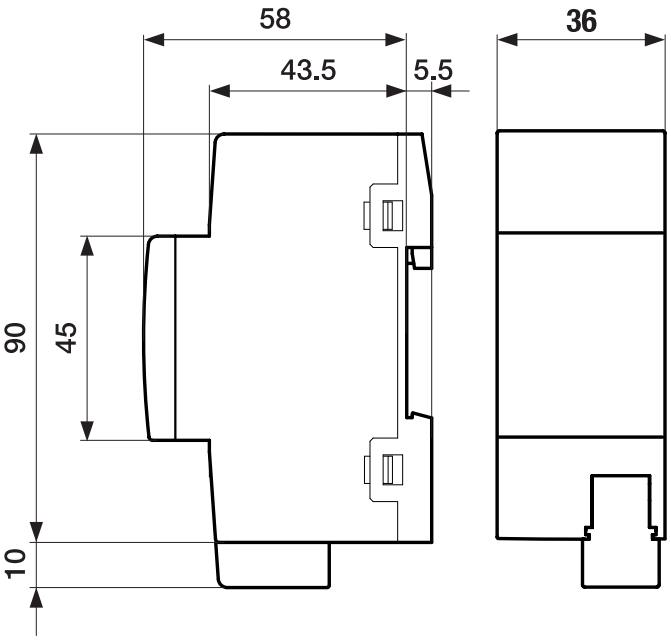

Fig. 26: Dimension drawing

3.11.2 Connection diagram

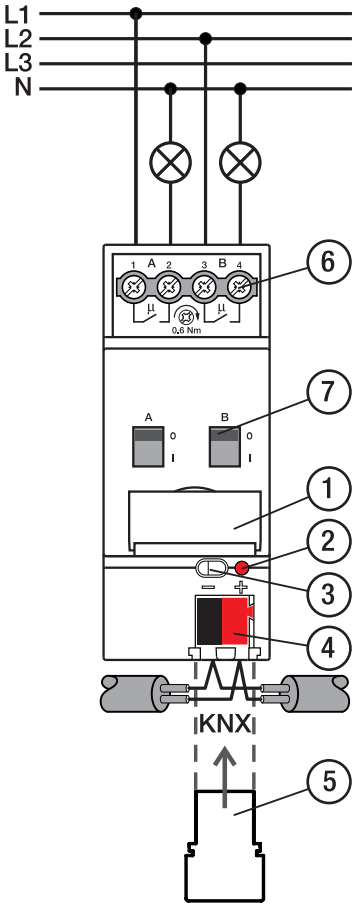

Fig. 27: Connection diagram

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Legend

1 Label carriers
2 Programming LED
3 Programming button
4 Bus connection terminal
5 Cover cap
6 Load circuit, two screw terminals each
7 Contact position indication and ON/OFF actuation

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3.11.3 Operating and display elements

Button/LED	Description/function	LED indicator
 Programming	Assignment of the physical address	On: The device is in programming mode.
 Toggle switches	The toggle switches indicate the position of the contacts: closed (I), open (0). The load circuits can be switched on (I) and off (0) manually using the toggle switches.	Not available

3.11.4 Technical data

3.11.4.1 General technical data

Supply	Bus voltage	21 … 32 V DC
	Current consumption, bus	< 12 mA
	Power loss, bus	Max. 250 mW
	Power loss, device	2 W
Connections	KNX	Ø 0.8 mm single core (via bus connection terminal)
Connection terminals	Screw terminal	Screw terminal with universal head (PZ 1)
		0.2 … 4 mm² stranded, 2 × (0.2 … 2.5 mm²)
		0.2 … 6 mm² single core, 2 × (0.2 … 4 mm²)
	Ferrule without plastic sleeve	0.25 … 2.5 mm²
	Ferrule with plastic sleeve	0.25 … 4 mm²
	TWIN ferrules	0.5 … 2.5 mm²
	Ferrule contact pin length	Min. 10 mm
	Tightening torque	Max. 0.6 Nm
Degree of protection and protection class	Degree of protection	IP 20 to EN 60529
	Protection class	II to EN 61140
Isolation category	Overvoltage category	III to EN 60664-1
	Pollution degree	II to EN 60664-1
	Fire classification	Flammability V-0 as per UL94
SELV	KNX safety extra low voltage	SELV 24 V DC
Temperature range	Operation	–5 … +45 °C
	Transport	-25 … +70 °C
	Storage	-25 … +55 °C
Ambient conditions	Maximum air humidity	95 %, no condensation allowed
Design	Modular installation device (MDRC)	Modular installation device
	Design	pro*M*
	Housing/color	Plastic, gray
Dimensions	Dimensions	90 x 36 x 63.5 mm (H x W x D)
	Mounting width in space units	2 modules
	Mounting depth	63.5 mm
Mounting	35 mm mounting rail	To EN 60715
	Mounting position	Any
	Weight (net)	0.13 kg
Approvals	KNX certification	To EN 50090-1, -2
	CE marking	In accordance with the EMC and Low Voltage Directives

3.11.4.2 Device type

Device type	Switch Actuator	SA/S 2.16.2.2
	Application	Switch Standard 2f 16 A / …
		… = current version number of the application
	Maximum number of group objects	136
	Maximum number of group addresses	1,000
	Maximum number of assignments	1,000

Note

Observe software information on the website → www.abb.com/knx.

Note

The device supports the locking function of a KNX device in ETS. If a BCU code was assigned, the device can be read and programmed only with this BCU code.

3.11.4.3 Output, rated current 16 A

Rated values	Number of outputs	2
	U_n rated voltage	230 V AC (50/60 Hz)
	I_n rated current (per output pair)	16 A
	Maximum current per device	2 x 16 A
Switching currents	AC3 operation (cos ϕ= 0.45) to EN 60947-4-1	8 A / 230 V AC
	AC1 operation (cos ϕ= 0.8) to EN 60947-4-1	16 A / 230 V AC
	Fluorescent lighting load according to EN 60669-1	16 A (140 uF)
	Minimum switching current at 12 V AC	100 mA
	Minimum switching current at 24 V AC	100 mA
	DC switching capacity, resistive load, at 24 V DC	16 A
Service life	Mechanical service life	> 3 x 10^6 cycles
	Electrical service life of switching contacts to IEC 60947-4-1:	
	AC1 (240 V/cos ϕ=0.8)	> 10^5 cycles
	AC3 (240 V/cos ϕ=0.45)	> 3 × 10^4 cycles
	AC5a (240 V/cos ϕ=0.45)	> 3 × 10^4 cycles
Switching times	Maximum output relay position changes per minute if all relays are switched.	60
	Maximum output relay position changes per minute if only one relay is switched.	120

3.11.4.4 Output, lamp load 16 A

Lamps	Incandescent lamp load	2,500 W
Fluorescent lamps	Uncompensated	2,500 W
	Parallel compensated	1,500 W
	DUO circuit	1,500 W
Low-voltage halogen lamps	Inductive transformer	1,200 W
	Electronic transformer	1,500 W
	Halogen 230 V	2,500 W
Dulux lamp	Uncompensated	1,100 W
	Parallel compensated	1,100 W
Mercury-vapor lamp	Uncompensated	2,000 W
	Parallel compensated	2,000 W
Switching capacity (switching contact)	Maximum peak inrush current I_p (150 µs)	400 A
	Maximum peak inrush current I_p (250 µs)	320 A
	Maximum peak inrush current I_p (600 µs)	200 A
Number of ballasts (T5/T8, single element)	18 W (ABB ballast 1 x 18 SF)	23
	24 W (ABB ballast T5 1 x 24 CY)	23
	36 W (ABB ballast 1 x 36 CF)	14
	58 W (ABB ballast 1 x 58 CF)	11
	80 W (Helvar EL 1 x 80 SC)	10
Energy-saving lamps	LED lamps	400 W
Rated motor power		1,840 W

Note

The peak inrush current I_p is the typical ballast load current that results during switching. Using the peak inrush current I_p, it is possible to calculate the maximum number of switchable ballasts at the Switch Actuator output for the various ballast types. The number of ballasts specified in the table can be only a sample guide value.

3.12 Switch Actuator SA/S 4.16.2.2

Fig. 28: Device illustration SA/S 4.16.2.2

The Switch Actuator is a modular installation device in pro*M* design. The device is designed for installation in electrical distribution boards and small housings for rapid mounting on a 35-mm mounting rail (to EN 60715).

The device possesses mutually independent switching relays with which the following functions can be implemented:

- Switching electric consumers (alternating or three-phase current)

The device is provided with bus voltage via the bus (ABB i-bus® KNX). The connection to the bus (ABB i-bus® KNX) is implemented using the bus connection terminal. The consumers are connected at the outputs using screw terminals (terminal designation on the housing).

The outputs can be switched manually using toggle switches.

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3.12.1 Dimension drawing

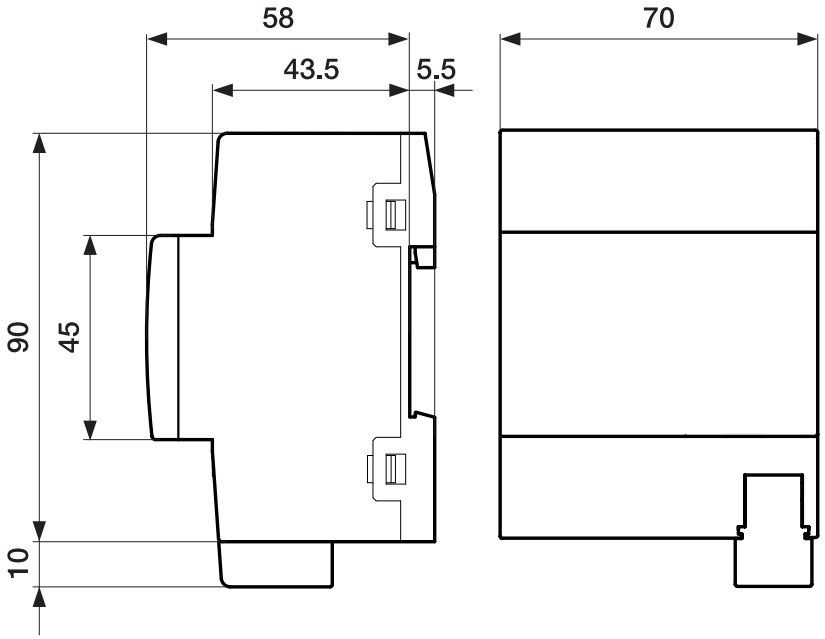

Fig. 29: Dimension drawing

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3.12.2 Connection diagram

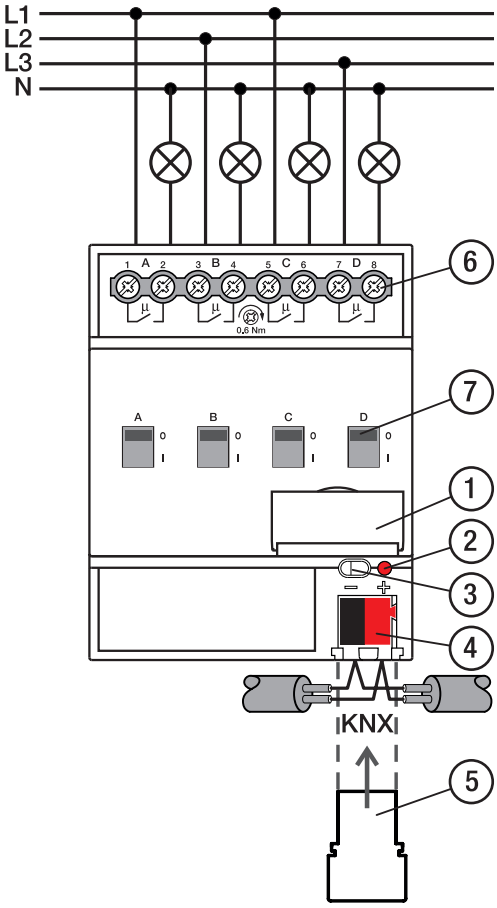

Fig. 30: Connection diagram

Legend

1 Label carriers
2 Programming LED
3 Programming button
4 Bus connection terminal
5 Cover cap
6 Load circuit, two screw terminals each
7 Contact position indication and ON/OFF actuation

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3.12.3 Operating and display elements

Button/LED	Description/function	LED indicator
 Programming	Assignment of the physical address	On: The device is in programming mode.
 Toggle switches	The toggle switches indicate the position of the contacts: closed (I), open (0). The load circuits can be switched on (I) and off (0) manually using the toggle switches.	Not available

3.12.4 Technical data

3.12.4.1 General technical data

Supply	Bus voltage	21 … 32 V DC
	Current consumption, bus	< 12 mA
	Power loss, bus	Max. 250 mW
	Power loss, device	4.0 W
Connections	KNX	Ø 0.8 mm single core (via bus connection terminal)
Connection terminals	Screw terminal	Screw terminal with universal head (PZ 1)
		0.2 … 4 mm² stranded, 2 × (0.2 … 2.5 mm²)
		0.2 … 6 mm² single core, 2 × (0.2 … 4 mm²)
	Ferrule without plastic sleeve	0.25 … 2.5 mm²
	Ferrule with plastic sleeve	0.25 … 4 mm²
	TWIN ferrules	0.5 … 2.5 mm²
	Ferrule contact pin length	Min. 10 mm
	Tightening torque	Max. 0.6 Nm
Degree of protection and protection class	Degree of protection	IP 20 to EN 60529
	Protection class	II to EN 61140
Isolation category	Overvoltage category	III to EN 60664-1
	Pollution degree	II to EN 60664-1
	Fire classification	Flammability V-0 as per UL94
SELV	KNX safety extra low voltage	SELV 24 V DC
Temperature range	Operation	–5 … +45 °C
	Transport	-25 … +70 °C
	Storage	-25 … +55 °C
Ambient conditions	Maximum air humidity	95 %, no condensation allowed
Design	Modular installation device (MDRC)	Modular installation device
	Design	pro*M*
	Housing/color	Plastic, gray
Dimensions	Dimensions	90 x 70 x 63.5 mm (H x W x D)
	Mounting width in space units	4 modules
	Mounting depth	63.5 mm
Mounting	35 mm mounting rail	To EN 60715
	Mounting position	Any
	Weight (net)	0.215 kg
Approvals	KNX certification	To EN 50090-1, -2
	CE marking	In accordance with the EMC and Low Voltage Directives

3.12.4.2 Device type

Device type	Switch Actuator	SA/S 4.16.2.2
	Application	Switch Standard 4f 16 A / …
		… = current version number of the application
	Maximum number of group objects	166
	Maximum number of group addresses	1,000
	Maximum number of assignments	1,000

Note

Observe software information on the website → www.abb.com/knx.

Note

The device supports the locking function of a KNX device in ETS. If a BCU code was assigned, the device can be read and programmed only with this BCU code.

3.12.4.3 Output, rated current 16 A

Rated values	Number of outputs	4
	U_n rated voltage	230 V AC (50/60 Hz)
	I_n rated current (per output pair)	16 A
	Maximum current per device	4 x 16 A
Switching currents	AC3 operation (cos ϕ= 0.45) to EN 60947-4-1	8 A / 230 V AC
	AC1 operation (cos ϕ= 0.8) to EN 60947-4-1	16 A / 230 V AC
	Fluorescent lighting load according to EN 60669-1	16 A (140 uF)
	Minimum switching current at 12 V AC	100 mA
	Minimum switching current at 24 V AC	100 mA
	DC switching capacity, resistive load, at 24 V DC	16 A
Service life	Mechanical service life	> 3 x 10^6 cycles
	Electrical service life of switching contacts to IEC 60947-4-1:	
	AC1 (240 V/cos ϕ=0.8)	> 10^5 cycles
	AC3 (240 V/cos ϕ=0.45)	> 3 × 10^4 cycles
	AC5a (240 V/cos ϕ=0.45)	> 3 × 10^4 cycles
Switching times	Maximum output relay position changes per minute if all relays are switched.	30
	Maximum output relay position changes per minute if only one relay is switched.	120

3.12.4.4 Output, lamp load 16 A

Lamps	Incandescent lamp load	2,500 W
Fluorescent lamps	Uncompensated	2,500 W
	Parallel compensated	1,500 W
	DUO circuit	1,500 W
Low-voltage halogen lamps	Inductive transformer	1,200 W
	Electronic transformer	1,500 W
	Halogen 230 V	2,500 W
Dulux lamp	Uncompensated	1,100 W
	Parallel compensated	1,100 W
Mercury-vapor lamp	Uncompensated	2,000 W
	Parallel compensated	2,000 W
Switching capacity (switching contact)	Maximum peak inrush current I_p (150 µs)	400 A
	Maximum peak inrush current I_p (250 µs)	320 A
	Maximum peak inrush current I_p (600 µs)	200 A
Number of ballasts (T5/T8, single element)	18 W (ABB ballast 1 x 18 SF)	23
	24 W (ABB ballast T5 1 x 24 CY)	23
	36 W (ABB ballast 1 x 36 CF)	14
	58 W (ABB ballast 1 x 58 CF)	11
	80 W (Helvar EL 1 x 80 SC)	10
Energy-saving lamps	LED lamps	400 W
Rated motor power		1,840 W

Note

The peak inrush current I_p is the typical ballast load current that results during switching. Using the peak inrush current I_p, it is possible to calculate the maximum number of switchable ballasts at the Switch Actuator output for the various ballast types. The number of ballasts specified in the table can be only a sample guide value.

3.13 Switch Actuator SA/S 8.16.2.2

Fig. 31: Device illustration SA/S 8.16.2.2

The Switch Actuator is a modular installation device in pro*M* design. The device is designed for installation in electrical distribution boards and small housings for rapid mounting on a 35-mm mounting rail (to EN 60715).

The device possesses mutually independent switching relays with which the following functions can be implemented:

- Switching electric consumers (alternating or three-phase current)

The device is provided with bus voltage via the bus (ABB i-bus® KNX). The connection to the bus (ABB i-bus® KNX) is implemented using the bus connection terminal. The consumers are connected at the outputs using screw terminals (terminal designation on the housing).

The outputs can be switched manually using toggle switches.

3.13.1 Dimension drawing

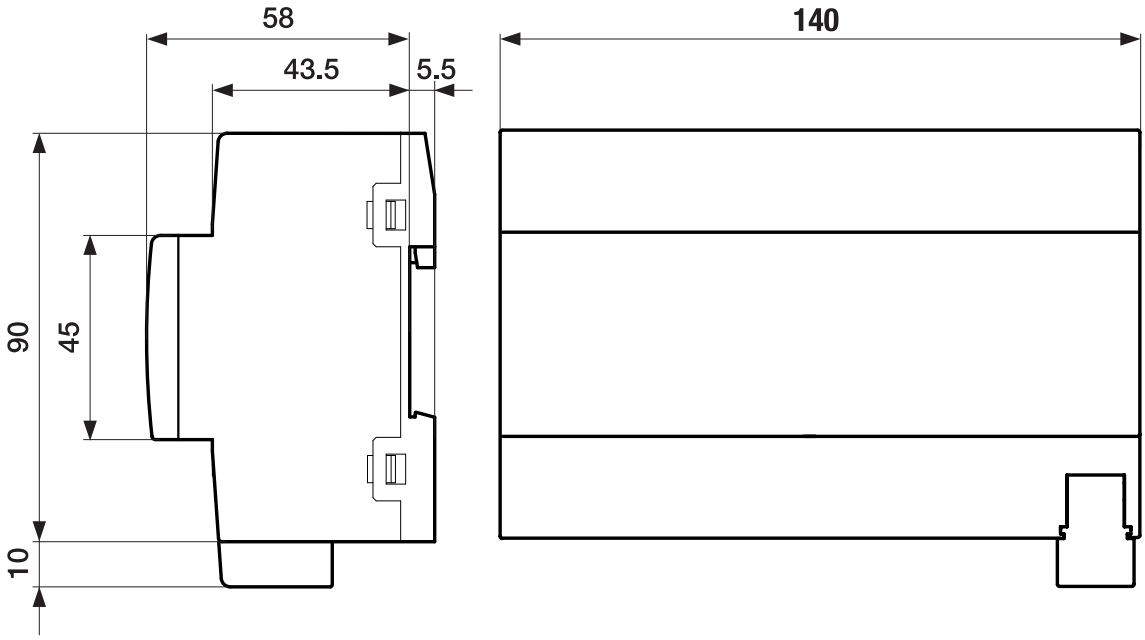

Fig. 32: Dimension drawing

3.13.2 Connection diagram

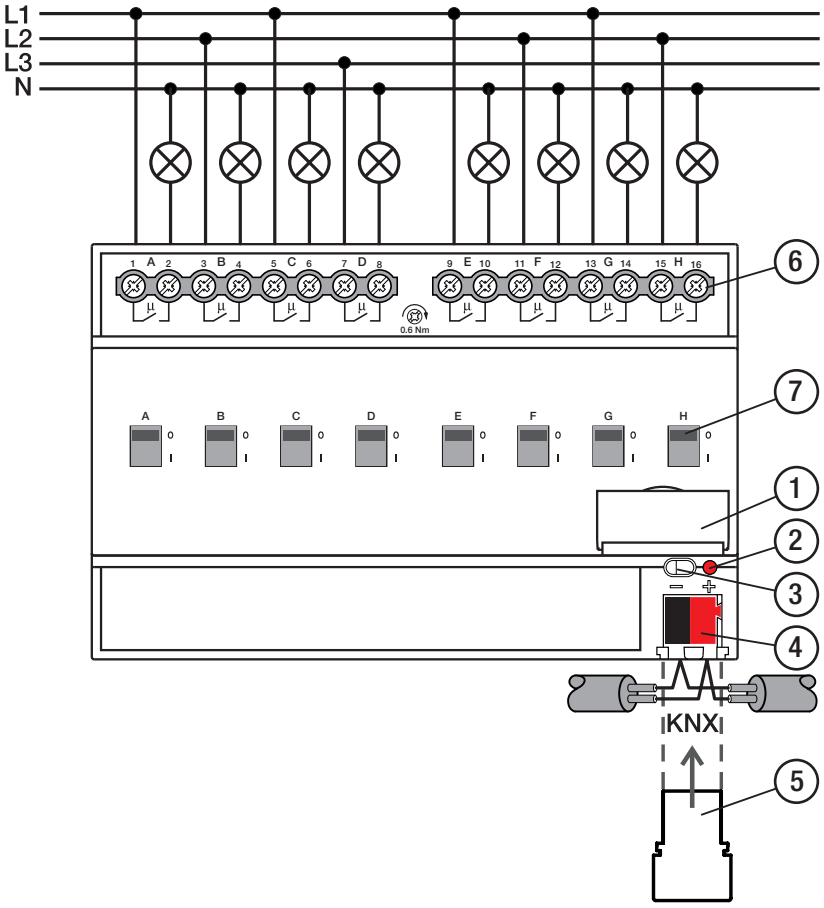

Fig. 33: Connection diagram

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Legend

1 Label carriers
2 Programming LED
3 Programming button
4 Bus connection terminal
5 Cover cap
6 Load circuit, two screw terminals each
7 Contact position indication and ON/OFF actuation

3.13.3 Operating and display elements

Button/LED	Description/function	LED indicator
 Programming	Assignment of the physical address	On: The device is in programming mode.
 Toggle switches	The toggle switches indicate the position of the contacts: closed (I), open (0). The load circuits can be switched on (I) and off (0) manually using the toggle switches.	Not available

3.13.4 Technical data

3.13.4.1 General technical data

Supply	Bus voltage	21 … 32 V DC
	Current consumption, bus	< 12 mA
	Power loss, bus	Max. 250 mW
	Power loss, device	8.0 W
Connections	KNX	Ø 0.8 mm single core (via bus connection terminal)
Connection terminals	Screw terminal	Screw terminal with universal head (PZ 1)
		0.2 … 4 mm² stranded, 2 × (0.2 … 2.5 mm²)
		0.2 … 6 mm² single core, 2 × (0.2 … 4 mm²)
	Ferrule without plastic sleeve	0.25 … 2.5 mm²
	Ferrule with plastic sleeve	0.25 … 4 mm²
	TWIN ferrules	0.5 … 2.5 mm²
	Ferrule contact pin length	Min. 10 mm
	Tightening torque	Max. 0.6 Nm
Degree of protection and protection class	Degree of protection	IP 20 to EN 60529
	Protection class	II to EN 61140
Isolation category	Overvoltage category	III to EN 60664-1
	Pollution degree	II to EN 60664-1
	Fire classification	Flammability V-0 as per UL94
SELV	KNX safety extra low voltage	SELV 24 V DC
Temperature range	Operation	–5 … +45 °C
	Transport	-25 … +70 °C
	Storage	-25 … +55 °C
Ambient conditions	Maximum air humidity	95 %, no condensation allowed
Design	Modular installation device (MDRC)	Modular installation device
	Design	pro*M*
	Housing/color	Plastic, gray
Dimensions	Dimensions	90 x 140 x 63.5 mm (H x W x D)
	Mounting width in space units	8 modules
	Mounting depth	63.5 mm
Mounting	35 mm mounting rail	To EN 60715
	Mounting position	Any
	Weight (net)	0.406 kg
Approvals	KNX certification	To EN 50090-1, -2
	CE marking	In accordance with the EMC and Low Voltage Directives

3.13.4.2 Device type

Device type	Switch Actuator	SA/S 8.16.2.2
	Application	Switch Standard 8f 16 A / …
		… = current version number of the application
	Maximum number of group objects	226
	Maximum number of group addresses	1,000
	Maximum number of assignments	1,000

Note

Observe software information on the website → www.abb.com/knx.

Note

The device supports the locking function of a KNX device in ETS. If a BCU code was assigned, the device can be read and programmed only with this BCU code.

3.13.4.3 Output, rated current 16 A

Rated values	Number of outputs	8
	U_n rated voltage	230 V AC (50/60 Hz)
	I_n rated current (per output pair)	16 A
	Maximum current per device	8 x 16 A
Switching currents	AC3 operation (cos ϕ= 0.45) to EN 60947-4-1	8 A / 230 V AC
	AC1 operation (cos ϕ= 0.8) to EN 60947-4-1	16 A / 230 V AC
	Fluorescent lighting load according to EN 60669-1	16 A (140 uF)
	Minimum switching current at 12 V AC	100 mA
	Minimum switching current at 24 V AC	100 mA
	DC switching capacity, resistive load, at 24 V DC	16 A
Service life	Mechanical service life	> 3 x 10^6 cycles
	Electrical service life of switching contacts to IEC 60947-4-1:	
	AC1 (240 V/cos ϕ=0.8)	> 10^5 cycles
	AC3 (240 V/cos ϕ=0.45)	> 3 × 10^4 cycles
	AC5a (240 V/cos ϕ=0.45)	> 3 × 10^4 cycles
Switching times	Maximum output relay position changes per minute if all relays are switched.	15
	Maximum output relay position changes per minute if only one relay is switched.	120

3.13.4.4 Output, lamp load 16 A

Lamps	Incandescent lamp load	2,500 W
Fluorescent lamps	Uncompensated	2,500 W
	Parallel compensated	1,500 W
	DUO circuit	1,500 W
Low-voltage halogen lamps	Inductive transformer	1,200 W
	Electronic transformer	1,500 W
	Halogen 230 V	2,500 W
Dulux lamp	Uncompensated	1,100 W
	Parallel compensated	1,100 W
Mercury-vapor lamp	Uncompensated	2,000 W
	Parallel compensated	2,000 W
Switching capacity (switching contact)	Maximum peak inrush current I_p (150 µs)	400 A
	Maximum peak inrush current I_p (250 µs)	320 A
	Maximum peak inrush current I_p (600 µs)	200 A
Number of ballasts (T5/T8, single element)	18 W (ABB ballast 1 x 18 SF)	23
	24 W (ABB ballast T5 1 x 24 CY)	23
	36 W (ABB ballast 1 x 36 CF)	14
	58 W (ABB ballast 1 x 58 CF)	11
	80 W (Helvar EL 1 x 80 SC)	10
Energy-saving lamps	LED lamps	400 W
Rated motor power		1,840 W

Note

The peak inrush current I_p is the typical ballast load current that results during switching. Using the peak inrush current I_p, it is possible to calculate the maximum number of switchable ballasts at the Switch Actuator output for the various ballast types. The number of ballasts specified in the table can be only a sample guide value.

3.14 Switch Actuator SA/S 12.16.2.2

9PAA000000008211-Rev_A

Fig. 34: Device illustration SA/S 12.16.2.2

The Switch Actuator is a modular installation device in pro*M* design. The device is designed for installation in electrical distribution boards and small housings for rapid mounting on a 35-mm mounting rail (to EN 60715).

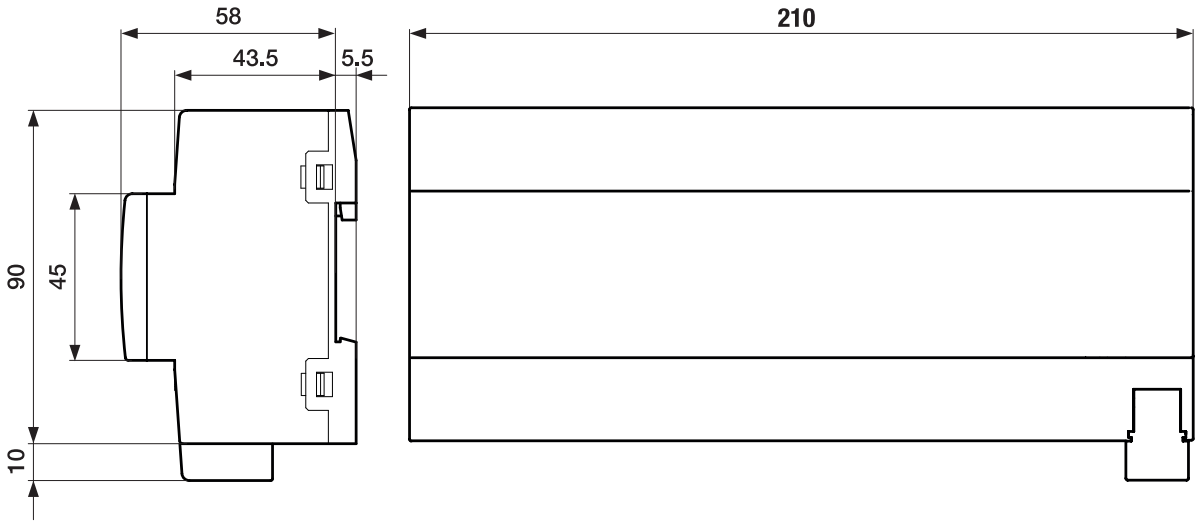
The device possesses mutually independent switching relays with which the following functions can be implemented:

- Switching electric consumers (alternating or three-phase current)

The device is provided with bus voltage via the bus (ABB i-bus® KNX). The connection to the bus (ABB i-bus® KNX) is implemented using the bus connection terminal. The consumers are connected at the outputs using screw terminals (terminal designation on the housing).

The outputs can be switched manually using toggle switches.

3.14.1 Dimension drawing



2CDC072028F0017

Fig. 35: Dimension drawing

3.14.2 Connection diagram

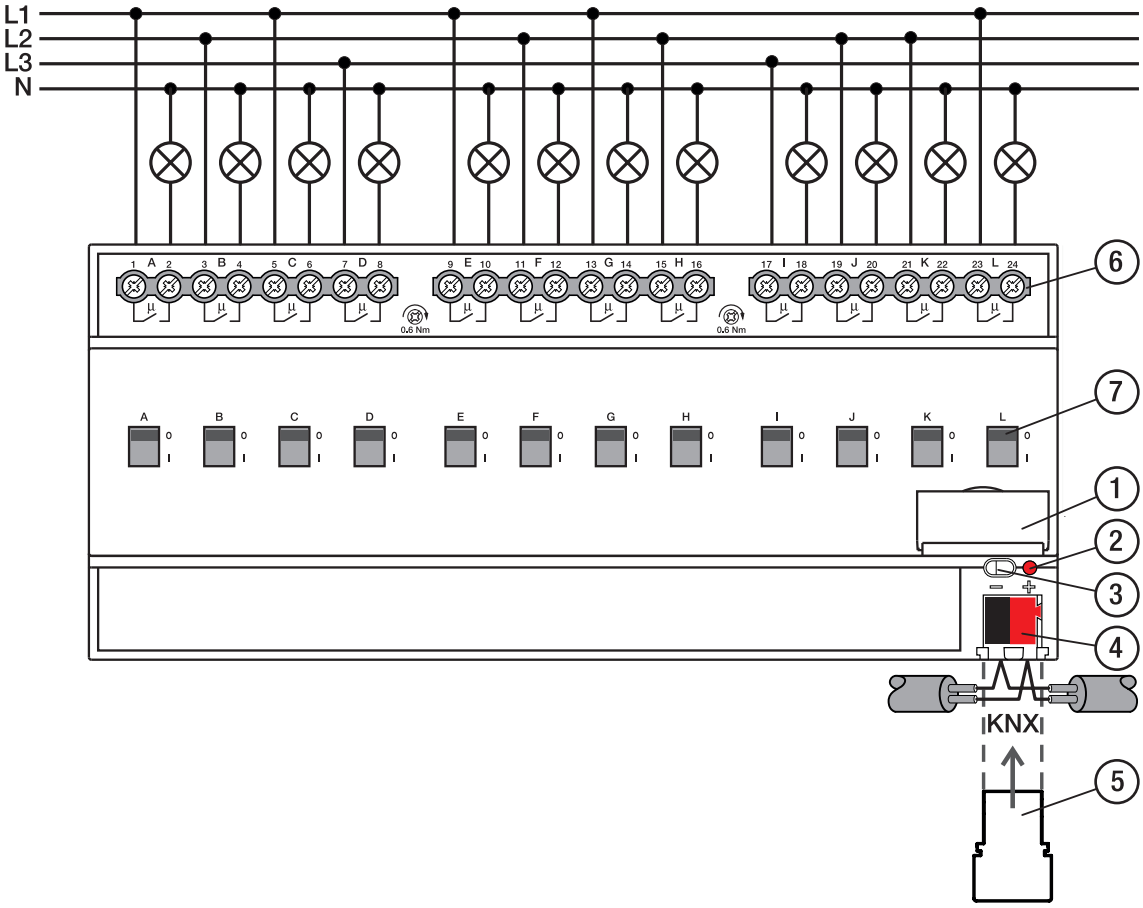


Fig. 36: Connection diagram

—

Legend

1 Label carriers
2 Programming LED
3 Programming button
4 Bus connection terminal
5 Cover cap
6 Load circuit, two screw terminals each
7 Contact position indication and ON/OFF actuation

3.14.3 Operating and display elements

Button/LED	Description/function	LED indicator
 Programming	Assignment of the physical address	On: The device is in programming mode.
 Toggle switches	The toggle switches indicate the position of the contacts: closed (I), open (0). The load circuits can be switched on (I) and off (0) manually using the toggle switches.	Not available

3.14.4 Technical data

3.14.4.1 General technical data

Supply	Bus voltage	21 … 32 V DC
	Current consumption, bus	< 12 mA
	Power loss, bus	Max. 250 mW
	Power loss, device	12.0 W
Connections	KNX	Ø 0.8 mm single core (via bus connection terminal)
Connection terminals	Screw terminal	Screw terminal with universal head (PZ 1)
		0.2 … 4 mm² stranded, 2 × (0.2 … 2.5 mm²)
		0.2 … 6 mm² single core, 2 × (0.2 … 4 mm²)
	Ferrule without plastic sleeve	0.25 … 2.5 mm²
	Ferrule with plastic sleeve	0.25 … 4 mm²
	TWIN ferrules	0.5 … 2.5 mm²
	Ferrule contact pin length	Min. 10 mm
	Tightening torque	Max. 0.6 Nm
Degree of protection and protection class	Degree of protection	IP 20 to EN 60529
	Protection class	II to EN 61140
Isolation category	Overvoltage category	III to EN 60664-1
	Pollution degree	II to EN 60664-1
	Fire classification	Flammability V-0 as per UL94
SELV	KNX safety extra low voltage	SELV 24 V DC
Temperature range	Operation	–5 … +45 °C
	Transport	-25 … +70 °C
	Storage	-25 … +55 °C
Ambient conditions	Maximum air humidity	95 %, no condensation allowed
Design	Modular installation device (MDRC)	Modular installation device
	Design	pro*M*
	Housing/color	Plastic, gray
Dimensions	Dimensions	90 x 210 x 63.5 mm (H x W x D)
	Mounting width in space units	12 modules
	Mounting depth	63.5 mm
Mounting	35 mm mounting rail	To EN 60715
	Mounting position	Any
	Weight (net)	0.608 kg
Approvals	KNX certification	To EN 50090-1, -2
	CE marking	In accordance with the EMC and Low Voltage Directives

3.14.4.2 Device type

Device type	Switch Actuator	SA/S 12.16.2.2
	Application	Switch Standard 12f 16 A / …
		… = current version number of the application
	Maximum number of group objects	286
	Maximum number of group addresses	1,000
	Maximum number of assignments	1,000

Note

Observe software information on the website → www.abb.com/knx.

Note

The device supports the locking function of a KNX device in ETS. If a BCU code was assigned, the device can be read and programmed only with this BCU code.

3.14.4.3 Output, rated current 16 A

Rated values	Number of outputs	12
	U_n rated voltage	230 V AC (50/60 Hz)
	I_n rated current (per output pair)	16 A
	Maximum current per device	12 x 16 A
Switching currents	AC3 operation (cos ϕ= 0.45) to EN 60947-4-1	8 A / 230 V AC
	AC1 operation (cos ϕ= 0.8) to EN 60947-4-1	16 A / 230 V AC
	Fluorescent lighting load according to EN 60669-1	16 A (140 uF)
	Minimum switching current at 12 V AC	100 mA
	Minimum switching current at 24 V AC	100 mA
	DC switching capacity, resistive load, at 24 V DC	16 A
Service life	Mechanical service life	> 3 x 10^6 cycles
	Electrical service life of switching contacts to IEC 60947-4-1:	
	AC1 (240 V/cos ϕ=0.8)	> 10^5 cycles
	AC3 (240 V/cos ϕ=0.45)	> 3 × 10^4 cycles
	AC5a (240 V/cos ϕ=0.45)	> 3 × 10^4 cycles
Switching times	Maximum output relay position changes per minute if all relays are switched.	10
	Maximum output relay position changes per minute if only one relay is switched.	120

3.14.4.4 Output, lamp load 16 A

Lamps	Incandescent lamp load	2,500 W
Fluorescent lamps	Uncompensated	2,500 W
	Parallel compensated	1,500 W
	DUO circuit	1,500 W
Low-voltage halogen lamps	Inductive transformer	1,200 W
	Electronic transformer	1,500 W
	Halogen 230 V	2,500 W
Dulux lamp	Uncompensated	1,100 W
	Parallel compensated	1,100 W
Mercury-vapor lamp	Uncompensated	2,000 W
	Parallel compensated	2,000 W
Switching capacity (switching contact)	Maximum peak inrush current I_p (150 µs)	400 A
	Maximum peak inrush current I_p (250 µs)	320 A
	Maximum peak inrush current I_p (600 µs)	200 A
Number of ballasts (T5/T8, single element)	18 W (ABB ballast 1 x 18 SF)	23
	24 W (ABB ballast T5 1 x 24 CY)	23
	36 W (ABB ballast 1 x 36 CF)	14
	58 W (ABB ballast 1 x 58 CF)	11
	80 W (Helvar EL 1 x 80 SC)	10
Energy-saving lamps	LED lamps	400 W
Rated motor power		1,840 W

Note

The peak inrush current I_p is the typical ballast load current that results during switching. Using the peak inrush current I_p, it is possible to calculate the maximum number of switchable ballasts at the Switch Actuator output for the various ballast types. The number of ballasts specified in the table can be only a sample guide value.

4 Function

4.1 Function description

4.1.1 Function diagram of Switch Actuator

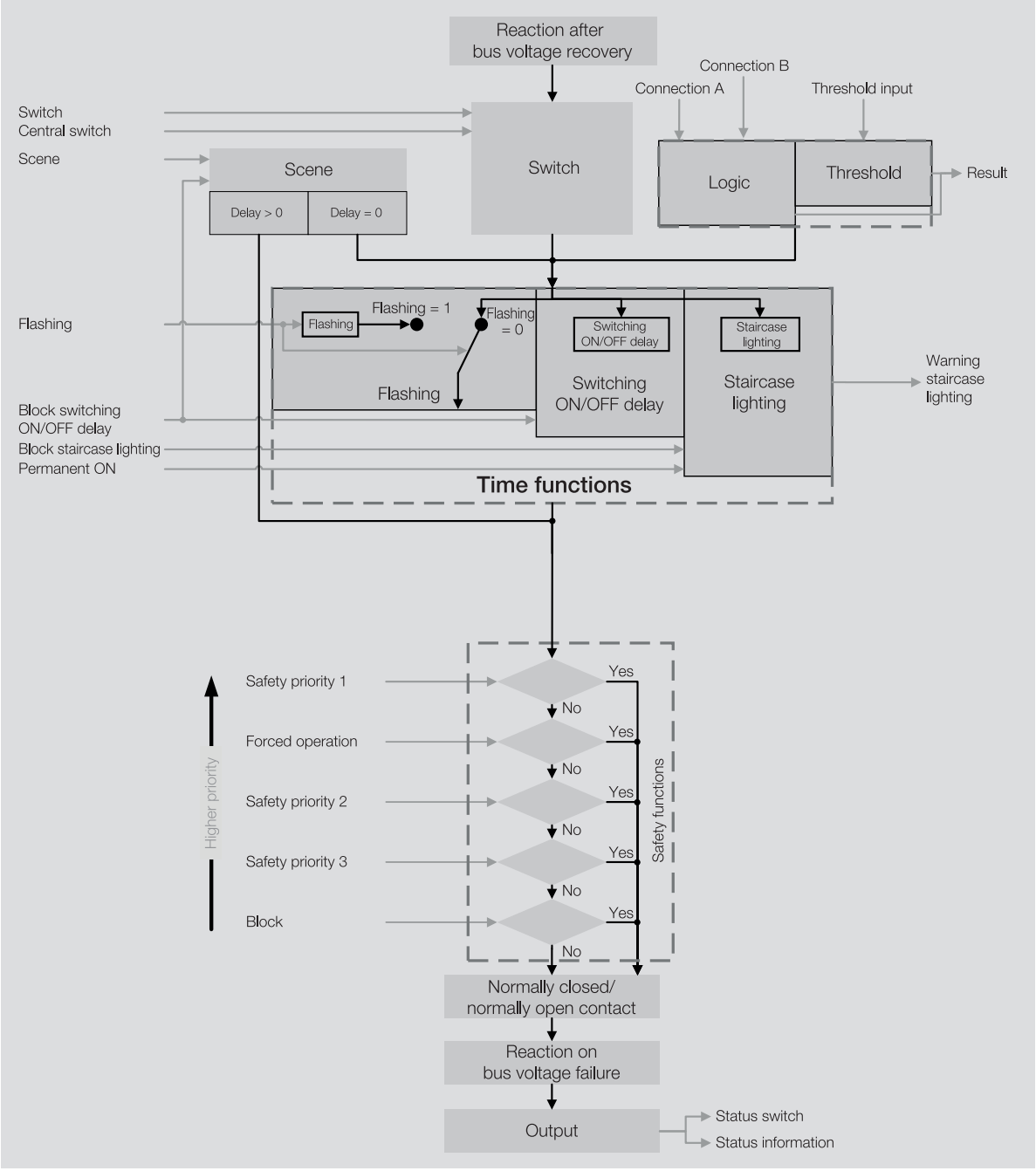


Fig. 37: Function diagram of Switch Actuator

4.1.2 Safety functions

4.1.2.1 Switch Actuator safety functions

4.1.2.1.1 Safety priority

The function *Safety priority* can be used to protect electrical loads on the switching output or to switch them in accordance with an installation situation.

Three different safety priorities are available for the Switch Actuator outputs The user can freely select which (if any) of the safety priorities each output should react to.

Each safety priority has its own group object. The group object and the corresponding safety function are enabled in the parameter Enable group object "Safety priority x". Safety priority x is active when

- a telegram with the value 1 is received on the group object Safety priority x .
- no telegram is received on the group object Safety priority x within the interval defined in the parameter Cyclical monitoring interval (0 = cycl. monitoring deactivated).

If a safety priority occurs, the relay assumes the switching position defined in the parameter Switching status for safety priority x.

When the corresponding safety priority is canceled, the relay assumes the switching position defined in the parameter Switching state on cancellation of disabling, forced operation and safety priority.

Note
If cyclical monitoring of the safety priority is used, the monitoring cycle in the device should be at least quadruple the cyclical transmission time of the sender (e.g. motion detector, glass breakage sensor). As a result, the parameterized safety priority will not be triggered immediately if a signal is missing (e.g. due to high bus load).

Note
In case of a safety priority, the output cannot be operated via other group objects or the i-bus® Tool until the safety priority is canceled.
Higher-priority safety functions will continue to run.

4.1.2.1.2 Disable

The function *Disable* can be used to define a specific switching position for the output and to disable operation in the parameter Disable. When disabling is canceled, the output's switching position is defined in the parameter Switching state on cancellation of disabling, forced operation and safety priority and operation is enabled.

Note
As long as disabling is active, the relay switching position cannot be changed via group objects or the i-bus® Tool.
Higher-priority safety functions will continue to run.

4.1.2.1.3 Forced operation

The function *Forced operation* can be used to set the output to a defined state and disable it. 1-bit or 2-bit forced operation can be used for this purpose.

Note
When the function *Forced operation* is active, the output can no longer be operated via other group objects until forced operation is canceled.
Higher-priority safety functions will continue to run.

A state that is set when forced operation is triggered can be parametrized with 1-bit forced operation. It can additionally be defined whether activation is to take place via the value 1 or 0.

Two states that are set when forced operation is triggered can be parametrized with 2-bit forced operation. The first bit activates forced operation. The second bit switches between the two states.

Bit 1	Bit 0	State of forced operation
0	0	Forced operation inactive
0	1	Forced operation inactive
1	0	Forced operation active, state Off
1	1	Forced operation active, state On

Tab. 4: Coding of 2-bit forced operation

The function *Forced operation* is set in the parameter Forced operation (1 bit / 2 bit).

When forced operation is canceled, the output's switching position is defined in the parameter Switching state on cancellation of disabling, forced operation and safety priority and operation is enabled.

Example:
The function *Forced operation* can be used to ensure that all lighting systems are switched on during a fire alarm and secured against being unintentionally switched off.

4.1.2.1.4 Priority of safety functions

The safety functions *Safety priority x*, *Disable* and *Forced operation* have priority over every other function.

The order of priority of the safety functions cannot be changed, → Priorities, Page 96.

4.1.3 Manual operation

The contacts can be switched on (I) and off (0) manually using the toggle switches even:
- if an output is disabled by a safety function
- in case of bus voltage failure

4.1.4 Refreshed KNX state

If an output is disabled by device-specific functions (e.g. alarms, disabling, forced operation, switching delay, etc.), it will not react to telegrams received via the ABB i-bus® KNX during the disabling.

The device processes these telegrams in the background and performs any active functions (e.g. staircase lighting, logic, position, brightness values, etc.) in the background as well. The current value is forwarded to the output only when the disabling of the output is canceled.

If the output does not receive any telegrams via theABB i-bus® KNX during disabling, the output will assume the state it was in before disabling.

4.1.5 Central group objects

The central group objects of the device can be used to switch several device outputs at the same time.

The following group object is available for central control of the Switch Actuator outputs:
- Switch

Note
In the parameter Switch output reacts to central Switch group object, it can be defined for each Switch Actuator output whether the output reacts to the central group object.

One group object is additionally available for joint scene activation:
- Scene 1 … 64

Note
Only outputs for which the retrieved scene was parameterized react to the retrieval.

4.1.6 Function Logic

The function *Logic* can be used to influence the reaction of an output by means of the following logic functions:
- AND
- OR
- Exclusive OR
- GATE

Two input group objects (Connection A , Connection B) and one result group object (Result) are available for each AND, OR, exclusive OR and GATE logic operation.

The result can be inverted, linked with any output within the device or output on the group object Result .

The result depends on the selected logic connection and the values in the corresponding input group objects. Refer to the table below for information about the reaction of the logic functions:

Logic function	Connection A	Connection B	Result	Explanation
AND	0	0	0	The result is 1 if both input values are 1.
	0	1	0	
	1	0	0	
	1	1	1	
OR	0	0	0	The result is 1 if one of the input values is 1.
	0	1	1	
	1	0	1	
	1	1	1	
Exclusive OR	0	0	0	The result is 1 if the input values differ.
	0	1	1	
	1	0	1	
	1	1	0	
GATE	Disabled	0	-	The value of group object Switch is processed only if the GATE is open. The value is ignored if the GATE is closed.
	Enabled	0	0	
	Disabled	1	-	
	Enabled	1	1	

Tab. 5: Values of the group objects

The result is recalculated when a value is received on one of the two input group objects Connection A or Connection B .

4.1.7 Function Threshold

The function *Threshold* is used to compare the value received at the threshold input with the thresholds set in the parameters Upper threshold and Lower threshold.

Depending on the setting in the parameter Data type of group object "Threshold input", one of the following group objects serves as the threshold input:
- Threshold input Percent (DPT 5.001), 0 % … 100 %
- Threshold input Meter pulses (DPT 5.010), 0 … 255
- Threshold input Meter pulses (DPT 7.001), 0 … 65,535
- Threshold input Temperature (DPT 9.001), -100 °C … 250 °C
- Threshold input Lux (DPT 9.004), 0 … 65,535

A result can be defined in the following parameters depending on whether the value of the threshold input is above, below or between the thresholds.
- Result if upper threshold is exceeded
- Result if lower threshold is dropped below
- Result if the input value is between the thresholds

Additionally, a minimum duration for undershooting and overshooting the thresholds can be defined in the following parameters.
- Min. duration of the overshoot
- Min. duration of the undershoot
- Minimum dwell time between the thresholds

The result can be inverted, linked with any output within the device or output on the group object Result .

If, in the Change thresholds via KNX parameter, the *Yes* option was set, the thresholds set in ETS can be changed using the following group objects. The DPT depends on the setting in the parameter Data type of group object "Threshold input".
- Change upper threshold Percent (DPT 5.001), 0 % … 100 %
- Change upper threshold Meter pulses (DPT 5.010), 0 … 255
- Change upper threshold Meter pulses (DPT 7.001), 0 … 65,535
- Change upper threshold Temperature (DPT 9.001), -100 °C … 250 °C
- Change upper threshold Lux (DPT 9.004), 0 … 65,535
- Change lower threshold Percent (DPT 5.001), 0 % … 100 %
- Change lower threshold Meter pulses (DPT 5.010), 0 … 255
- Change lower threshold Meter pulses (DPT 7.001), 0 … 65,535
- Change lower threshold Temperature (DPT 9.001), -100 °C … 250 °C
- Change lower threshold Lux (DPT 9.004), 0 … 65,535

4.1.8 Scenes

The function *Scenes* can be used to retrieve one of 16 scenes and incorporate additional KNX devices in a scene. Each scene can be retrieved or saved using a single telegram. Additionally, scene assignments 1 … 4 can be retrieved via the group object 0141-0144_Retrieve scene assignment x.

Prerequisite: all devices are parameterized with the same scene number and retrieval takes place via the same group address. For this purpose, a certain scene is assigned to the respective outputs in the parameter Scene number. The reaction (e.g. switching on output) on retrieval of this scene is defined in the following ETS parameters.

The advantage of the function *Scene* is that all settings to be made for the devices of a scene are stored in the device. Therefore, only the corresponding scene number must be sent when retrieving a scene via the ABB i-bus® KNX. This considerably reduces the load on the ABB i-bus® and prevents unnecessary telegram traffic. Joint activation of devices/outputs with different input values (e.g. Switch Actuator and Shutter Actuator) becomes possible as well.

4.1.8.1 Structure of scene telegram

A scene telegram contains the scene number (1 … 64) and information about whether to retrieve or save the scene.

Telegram value:

0 … 63 = retrieve scene x (x = 1 … 64)

128 … 191 = save scene x (x = 1 … 64)

More information → Code table 8-bit scene, Page 162.

4.1.9 Time functions

Three time functions are available for each output. One of the time functions can be selected in the parameter Enable function Time:

- → Function Staircase lighting, Page 90
- → Function Delay for switching ON and OFF, Page 92
- → Function Flashing, Page 93

The selected time function will be integrated into the other functions of the output.

More information → Function diagram of Switch Actuator, Page 85.

4.1.9.1 Function Staircase lighting

The function *Staircase lighting* can be used to implement time-controlled lighting (e.g. staircase lighting) or an application with a similar function (e.g. bathroom fan).

If the Reaction of output is defined as an *NO contact*, the contact is closed on receipt of a switch-on value and then opened again after expiry of the Staircase lighting time.

If the Reaction of output is defined as an *NC contact*, the contact is opened on receipt of a switch-on value and then closed again after expiry of the Staircase lighting time.

Depending on the option selected in the parameter Staircase lighting switchable, switching takes place on receipt of the switch-on value 0 or 1:

- on the group object Switch
- on the central group object Switch
- on the group object Scene 1…64
- on the central group object Scene 1 … 64
- as the result of the → Function Logic, Page 88
- as the result of the → Function Threshold, Page 88

The function *Staircase lighting* can announce the imminent end of the Staircase lighting time by opening or closing the contact one or more times (Warning time). Additionally, the end of the Staircase lighting time can be indicated via the group object Warning staircase lighting . The type of warning can be defined in the parameter Warning before switching off the staircase lighting.

The Warning time follows after the Staircase lighting time has elapsed.

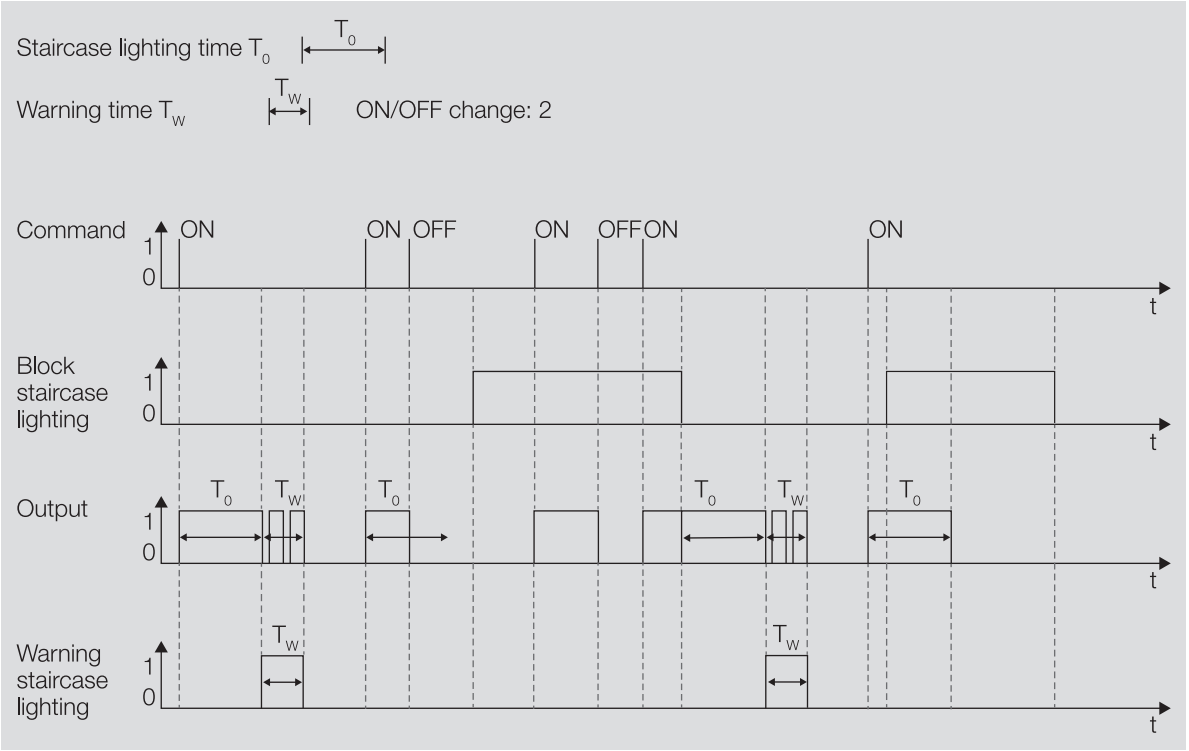


Fig. 38: Switch-on/switch-off reaction of the function Staircase lighting

4.1.9.1.1 Extending staircase lighting time (retriggering/pumping)

The staircase lighting time can be restarted by switching the lighting on again. The following option must be selected in the parameter Staircase lighting can be started again for this purpose: *Yes*.

Retriggering

The staircase lighting time can be restarted by switching on again any number of times if the following option is selected in the parameter Staircase lighting time extendable (pumping): *No, can only be started again*.

Pumping

If one of the parameters “Up to max. x times staircase lighting time” (x = 2 … 5) is selected in the parameter Staircase lighting time extendable (pumping), the staircase lighting time can be extended to max. five times the duration. If another switch-on command is received during the staircase lighting time or during the warning time, the staircase lighting time is extended by an additional staircase lighting time.

The following diagram shows the reaction on extension to quintuple the staircase lighting time:

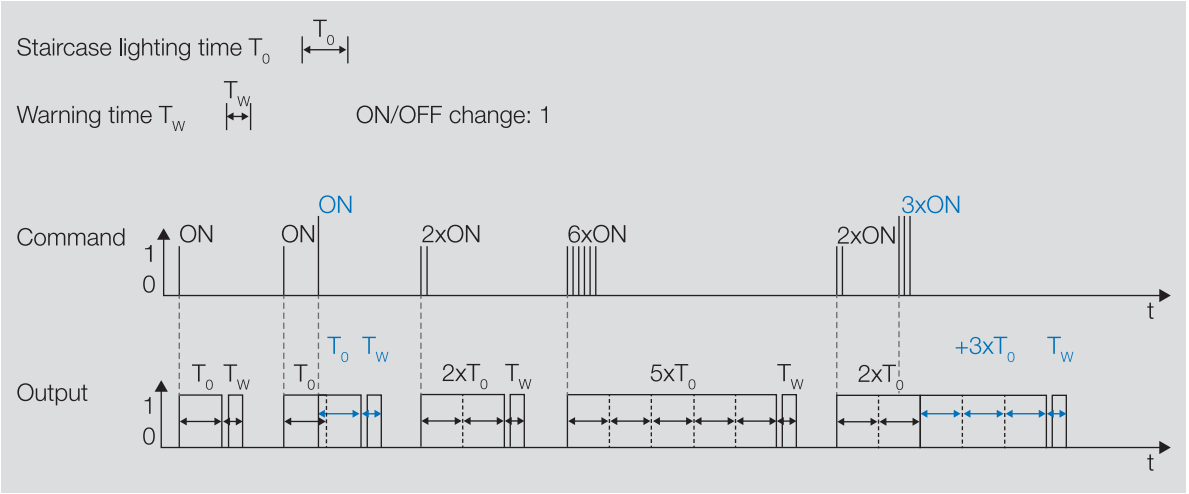


Fig. 39: Extending staircase lighting time (retriggering/pumping)

4.1.9.1.2 Disable staircase lighting

The function *Staircase lighting* can be disabled via the group object Disable staircase lighting . If the function *Staircase lighting* is disabled, the switch-on command is forwarded without time function in the function chain (→ Function diagram of Switch Actuator, Page 85) and the output reacts according to its parameterization.

4.1.9.1.3 Permanent ON

When the function *Staircase lighting* is active, the lighting can be permanently switched on via the group object Staircase lighting permanent ON . The output remains on as long as Permanent ON operation is active. Other functions continue to run in the background, but they do not trigger any switching operation. If Permanent ON operation is deactivated, the output will react to group object Switch .

The parameter Restart staircase lighting after end of permanent ON can be used to define how the lighting reacts after the end of Permanent ON operation.

The state of Permanent ON mode prior to download or bus voltage failure is restored after download or bus voltage recovery.

4.1.9.2 Function Delay for switching ON and OFF

The function *Delay for switching ON and OFF* can be used to switch the output on and off with a delay.

If the *Delay for switching ON* is used, the delay time T_{D1} begins after switch-on.

Switch-on takes place when the value 1 is received:
- on the group object Switch
- on the central group object Switch
- on the group object Scene 1…64
- on the central group object Scene 1 … 64
- as the result of the → Function Logic, Page 88
- as the result of the → Function Threshold, Page 88

If the Delay for switching OFF is used, the delay time T_{D0} begins after switch-off.

Switch-off takes place when the value 0 is received:
- on the group object Switch
- on the central group object Switch
- on the group object Scene 1…64
- on the central group object Scene 1 … 64
- as the result of the → Function Logic, Page 88
- as the result of the → Function Threshold, Page 88

Note
If, when a Scene number is retrieved, a Delay is used, the *Delay for switching ON and OFF* is not taken into account.

If switch-on is repeated during the Delay for switching ON, the Delay for switching ON is restarted.

If switch-off is repeated during the Delay for switching OFF, the Delay for switching OFF is restarted.

If a switch-off occurs during the Delay for switching ON T_{D1} ,switch-on will be rejected.

If a switch-on occurs during the Delay for switching OFF T_{D0}, switch-off will be rejected.

4.1.9.2.1 Disable delay for switching ON and OFF

The function *Delay for switching ON and OFF* can be disabled via the group object Disable delay for switching ON and OFF . If the function *Delay for switching ON and OFF* is disabled, the switch-on command is forwarded without time function in the function chain (→ Function diagram of Switch Actuator, Page 85) and the output reacts according to its parameterization.

4.1.9.3 Function Flashing

If the function *Flashing* is used, the relay is alternately opened and closed after receipt of a switch-on command. The switch-on command is issued via the group object Flashing .

The parameter Flashing if group object Flashing equals can be used to define the value with which a flashing cycle can be stared and prematurely ended.

The number and duration of switching operations can be defined in the following parameters:
- Time for ON
- Time for OFF
- Number of flashing cycles

Each flashing cycle begins with the On state. Whether the relay is opened or closed depends on whether the output is defined as an NC contact or NO contact in the parameter Reaction of output.

Each flashing cycle begins with the Off state. The relay contact position after the flashing cycle is ended can be defined in the parameter Contact position after flashing.

The flashing cycle restarts when a switch-on command is received on the group object Flashing .

Note
If the output is flashing, it will not react to:
- Group object Switch
- central group object Switch
- Group object Scene 1…64
- central group object Scene 1 … 64
- Result of the → Function Logic, Page 88
- Result of the → Function Threshold, Page 88

Note
Pay attention to the service life of the switching contacts when using the function *Flashing*. Refer to the Technical data for more information.

Note
Each relay can perform only a limited number of switching operations per minute. A large number of switching operations per minute can delay switching. Refer to the Technical data for more information.

4.2 Functional overview

	SA/S 2.X.2.2 SA/S 4.X.2.2 SA/S 8.X.2.2 SA/S 12.X.2.2
Type of outputs	Switch Actuator
Manual operation	X
Manual operation can be disabled	
Function Switch	
Staircase lighting	X
Staircase lighting advance warning	X
Switching ON/OFF delay	X
Flashing	X
NO contact/NC contact	X
Function Shutter	
Blind	
Shutter	
Automatic sun function	
Reversing time	
Reference movement	
Function Scene	X
Function Threshold	X
Function Logic	X
Forced operation/Disable	X
Safety	X
Weather alarms	
Current detection	
Threshold monitoring	
Measured value recording	
Special functions	
Priority during bus voltage failure/recovery	X
Status message	X
i-bus® Tool	X

Note
The interface to the i-bus® Tool is not available for Application V1.0. It will be implemented with the next version.

4.3 Functions of the inputs

This chapter is not relevant for this device.

4.4 Functions of the outputs

Note
A device with 12 channels (A … L) is described below.

The device outputs can be used individually to switch electric consumers.

Function	A	B	C	D	E	F	G	H	I	J	K	L
Switch	x	x	x	x	x	x	x	x	x	x	x	x

Tab. 6: Functions of the outputs

4.5 Integration into the i-bus® Tool

The i-bus® Tool can be used to read the data from the connected device. It can also be used to simulate values and test the following functions:

If there is no communication between the device and i-bus® Tool, the simulated values cannot be sent on the bus.

The i-bus® Tool can be downloaded free of charge from the company homepage (www.abb.com/knx).

Note
The interface to the i-bus® Tool is not available for Application V1.0. It will be implemented with the next version.

4.6 Special operating states

4.6.1 Reaction on bus voltage failure/recovery, download and ETS reset

The device's reaction on bus voltage failure, after bus voltage recovery, after ETS download and ETS reset can be set in the device parameters.

4.6.1.1 Bus voltage failure

Bus voltage failure describes the failure of the bus voltage, e.g. due to a power failure.

The reaction of the Switch Actuator outputs can be defined in the Parameter window Basic settings, in the parameter Reaction on bus voltage failure.

4.6.1.2 Bus voltage recovery

Bus voltage recovery is the state that exists after bus voltage is restored. The device will restart after bus voltage recovery.

The time set in the parameter Sending and switching delay after bus voltage recovery elapses before the device performs an action.

The reaction of the Switch Actuator outputs can be defined in the Parameter window Basic settings, in the parameter Reaction after bus voltage recovery.

4.6.1.3 ETS reset

During a ETS reset, the device reacts the same way as during bus voltage failure.

The reaction of the Switch Actuator outputs can be defined in the Parameter window Basic settings, in the parameter Reaction on bus voltage failure.

4.6.1.4 Download

Downloading describes loading a modified or updated ETS application onto the device. The device is not ready to operate during a download.

Reaction of the Switch Actuator outputs:

The relay contact position is frozen when downloading begins. The reaction after download can be defined in the Parameter window Basic settings, in the parameter Reaction after ETS download.

Note
The device will no longer operate after the application is uninstalled or after an interrupted download.
- ▶ Download again.

4.7 Priorities

4.7.1 Priorities for Switch Actuator

1 Bus voltage failure
2 Safety functions:
  Safety priority 1 (device)
  Forced operation (output)
  Safety priority 2 (device)
  Safety priority 3 (device)
  Disable (output)
  The order of priority of the safety functions cannot be changed.
3 i-bus® Tool
4 Operating mode *KNX operation*
5 Bus voltage recovery

Note
The interface to the i-bus® Tool is not available for Application V1.0. It will be implemented with the next version.

More information → Function diagram of Switch Actuator, Page 85.

5 Mounting and installation

5.1 Information about mounting

The device can be mounted in any position as required on a 35 mm mounting rail.

The electrical connection to the loads is made using screw terminals. The connection to the bus (ABB i-bus® KNX) is made using the bus connection terminal supplied. The terminal assignment is located on the housing.

Note

The maximum permissible current on a KNX line must not be exceeded.

- During planning and installation, ensure that the KNX line is correctly dimensioned. The device has a maximum current consumption of 12 mA.

DANGER - Severe injuries due to touch voltage

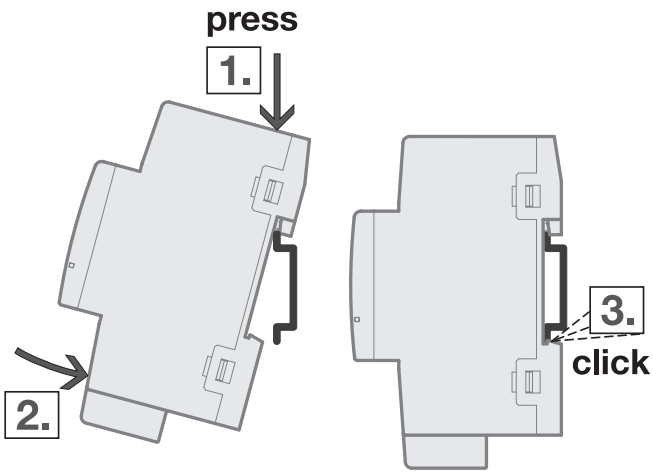
Feedback from differing phase conductors can produce touch voltages and lead to severe injuries.

- Operate the device only in a closed housing (distribution board).
- Disconnect all phases before working on the electrical connection.

5.2 Mounting on mounting rail

Note

No additional tools are required for mounting on the mounting rail.



2CDC072013F0015

Fig. 40: Mounting on mounting rail

1. Place the mounting rail holder on the upper edge of the mounting rail and push down.
2. Push the lower part of the device toward the mounting rail until the mounting rail holder engages.
   ⇨ The device is now mounted on the mounting rail.
3. Relieve the pressure on the top of the housing.

6 Commissioning

6.1 Prerequisites for commissioning

A PC with ETS and a connection to the ABB i-bus® KNX, e.g. via a KNX interface, are required to commission the device.

6.2 Commissioning overview

After activating the bus voltage for the first time, the following factory settings will be selected automatically:

- Physical address of the device: 15.15.255
- ETS application: preloaded

The device can be reprogrammed only using ETS.

Note
The complete ETS application can be downloaded again if required. Downloads may take longer after an application is uninstalled or when changing applications.

6.3 Putting device into operation

1. Connect the device to the (ABB i-bus® KNX).
2. Switch on bus voltage.
   ⇨ All switching contacts are open.
3. Switch on power supply of the connected loads.

⇨ Device is ready for operation.

6.4 Assignment of the physical address

Note
If it is set in ETS that the application is to be downloaded during programming, the download will begin after assignment of the physical address.

The physical address is assigned by ETS.

1. Press *Programming* button.
   ⇨ Programming mode active. *Programming* LED lights up.
2. Start programming process in ETS.

⇨ Physical address is assigned. Device restarts.

Note
The device performs an ETS reset during physical address assignment. All states are reset.

6.5 Software/application

Note
The interface to the i-bus® Tool is not available for Application V1.0. It will be implemented with the next version.

6.5.1 Download reaction

Using an interface that supports “long frames" (e.g. USB/S 1.2 or IPR/S 3.5.1) can significantly shorten the download time.

Depending on the PC used, it may take up to 90 seconds after a download is started for the progress bar to appear.

6.5.2 Copying, exchanging and converting

The ETS app *ABB Update Copy Convert* ETS can be used to copy/exchange parameter settings and convert the application version. The ETS app is available free of charge from the KNX online shop.

The following functions are available in the ETS app:

- *Update*: Changes the application program to a later or earlier version while retaining current configurations
- *Convert*: Transfers/adopts a configuration from an identical or compatible source device
- *Copy channel*: Copies a channel configuration to other channels on a multichannel device
- *Channel Exchange*: exchanges configurations between two channels on a multichannel device
- *Import/Export*: Saves and reads device configurations as external files

7 Parameters

7.1 General

ETS (Engineering Tool Software) is used to parameterize the device.

The following chapters describe the device parameters based on the parameter windows. The parameter windows have a dynamic design. Parameters are shown or hidden depending on the outputs' parameterization and function.

The default values of the parameters are underlined, e.g.:

No (checkbox cleared)

Yes (checkbox ticked)

Note
A device with 12 channels (A … L) is described below.

7.2 Parameter window Configuration

The following settings can be made in the Parameter window Configuration:

- Activate outputs
- Activate Logic and Threshold functions
- Limit number of telegrams

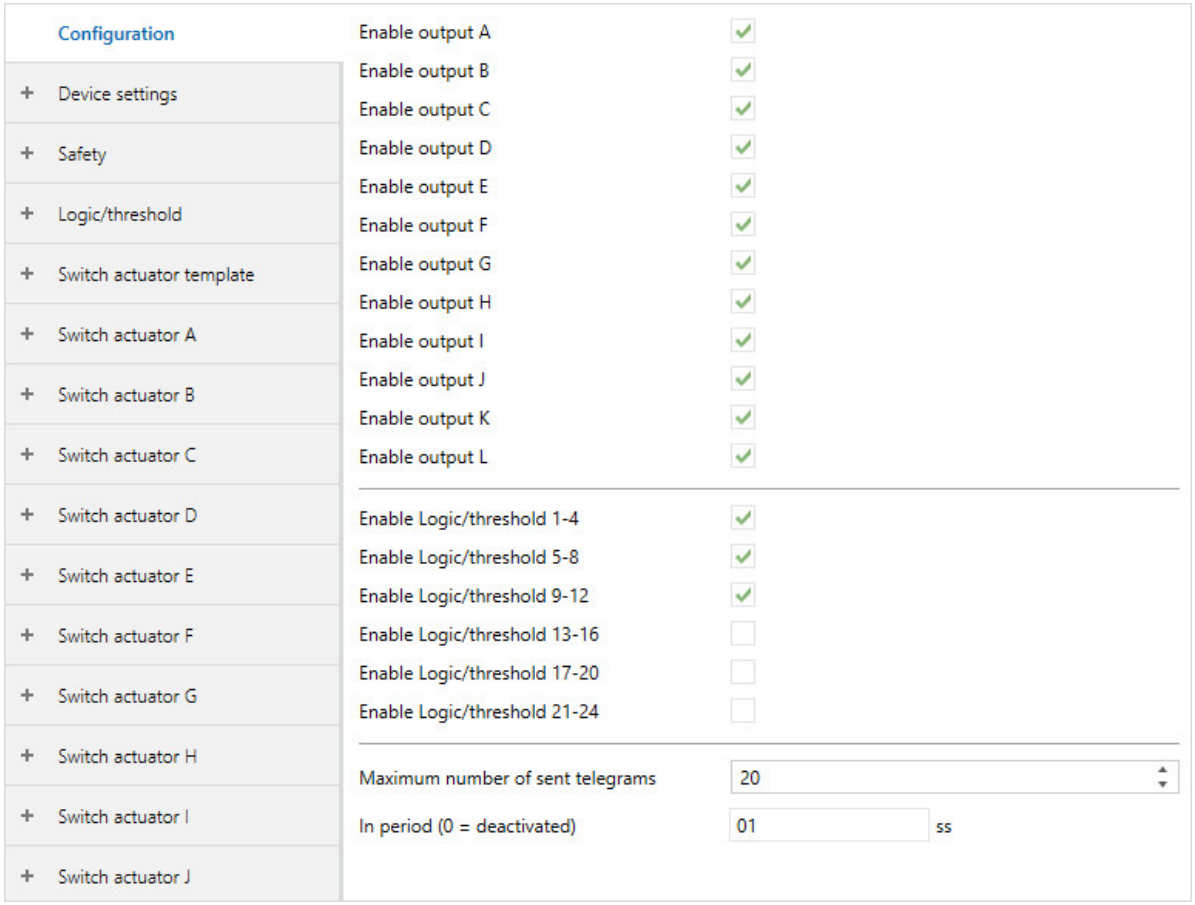


Fig. 41: Parameter window Configuration

Parameter

- Enable output X
- Enable Logic/Threshold X-Y
- Maximum number of sent telegrams
- In period (0 = deactivated)

7.2.1 Enable output X

These parameters can be used to enable the outputs. The enabled outputs are configured in Parameter window Switch Actuator A.

In the interest of a clear ETS structure, parameter windows and group objects of inactive outputs are hidden.

Options	
No	The output is not enabled.
Yes	The output is enabled, and the corresponding parameter window with the associated group objects opens.

7.2.2 Enable Logic/Threshold X-Y

This parameter can be used to enable the Logic and Threshold functions in groups of four.

The logic and threshold functions are configured in Parameter window Logic/Threshold 1.

In the interest of a clear ETS structure, parameter windows and group objects of the inactive logic and threshold functions are hidden.

The logic and threshold functions can be used independently or linked with an output.

More information → Function Logic, Page 88, → Function Threshold, Page 88.

Note
The default option shown here does not apply to all Logic/Threshold groups.

Options	
No	The logic and threshold functions are not enabled.
Yes	The logic and threshold functions are enabled, and the corresponding parameter window with the associated group objects opens.

7.2.3 Maximum number of sent telegrams

This parameter can be used to define the number of telegrams sent within a period that can be set.

More information → Telegram rate limitation, Page 161

Options
1 … 20 … 100

7.2.4 In period (0 = deactivated)

This parameter can be used to set the period during which the device sends telegrams.

The telegrams are sent as quickly as possible at the start of a period.

The parameter is linked with the parameter Maximum number of sent telegrams.

Note
The telegram rate limit is deactivated when the value 0 is selected.

Options
0 … 1 … 59 s

7.3 Parameter window Device settings

The following settings can be made in the Parameter window Device settings:

- Setting sending and switching delay
- Activate i-bus® Tool access
- Enable group object Request status values
- Enable central group objects

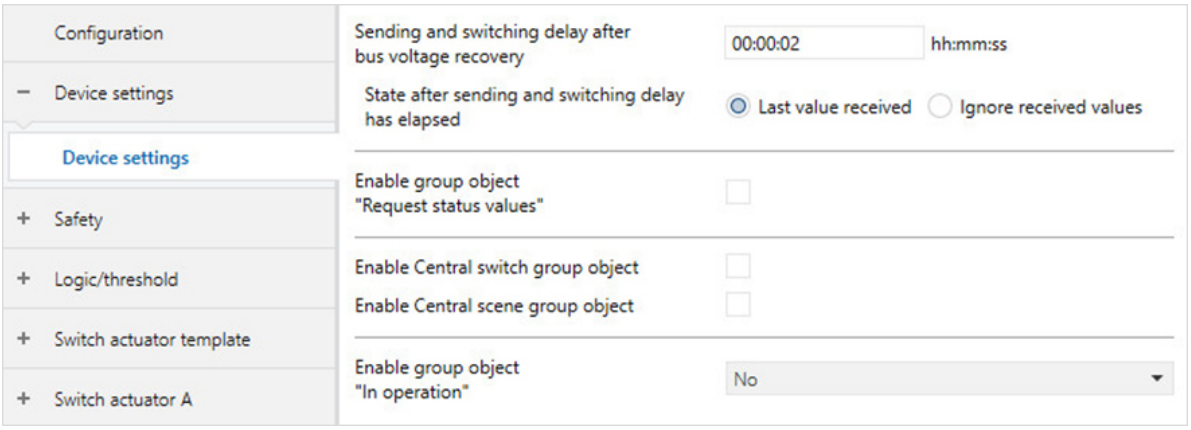


Fig. 42: Parameter window Device settings

Parameter

- Sending and switching delay after bus voltage recovery
- State after sending and switching delay has expired
- i-bus® Tool access
- Enable group object "Request status values"
- Enable central Switch group object
- Enable central Scene group object
- Enable group object "In operation"

7.3.1 Sending and switching delay after bus voltage recovery

This parameter can be used to set the sending and switching delay after bus voltage recovery.

During the sending and switching delay, telegrams are only received. No telegrams are sent on the product ABB i-bus® KNX. The state of the outputs remains unchanged.

Telegrams are sent again after the sending and switching delay expires. The state of the outputs is set in accordance with the parameterization or the group object values.

If group objects are read (e.g. from visual display systems) via the product ABB i-bus® KNX during the sending and switching delay, these requests are stored and answered after expiry of the sending and switching delay.

The sending and switching delay includes an initialization time of around two seconds. The initialization time is the time that the processor requires before it is ready to function.

After bus voltage recovery, telegrams are sent on the product ABB i-bus® KNX only after expiry of the sending and switching delay

Note
After bus voltage recovery, the device waits for the sending delay time to elapse before sending telegrams via the bus.

Note
The device draws energy for switching the outputs via the bus (ABB i-bus® KNX). After application of the bus voltage and after bus voltage recovery, it takes about 10 … 30 seconds before sufficient energy is available to switch all relays simultaneously.
The first relay is not switched until the device has stored sufficient energy to switch all outputs to a defined switching state in case of bus voltage failure.

Options
00:00:02 … 00:04:15 hh:mm:ss

7.3.2 State after sending and switching delay has expired

This parameter is used to set the values that are applicable at the inputs and outputs after expiration of the sending and switching delay.

Options	
Last value received	The inputs and outputs send the most recently received value after expiration of the sending and switching delay.
Ignore received values	Values received at the inputs and outputs are ignored during the sending and switching delay. The inputs and outputs react to the first value received after expiration of the sending and switching delay.

7.3.3 i-bus® Tool access

This parameter can be used to limit or completely disable access of the i-bus® Tool.

Note
The interface to the i-bus® Tool is not available for Application V1.0. It will be implemented with the next version.

Options	
Full access	Values can be displayed and changed via the i-bus® Tool. More information: → Integration into the i-bus® Tool, Page 95.
Deactivated	i-bus® Tool access is disabled.
Value display only	Only the status can be displayed via the i-bus® Tool.

7.3.4 Enable group object "Request status values"

All status messages of the device can be requested with the group object Request status values .

In order to send the status values, one of the following options must be defined for the sending behavior of the status group objects:
- *On request*
- *After change or on request*

Enabling of status group objects and further information:
- → Feedback of switching state via group object "Status switch", Page 123
- → Enable group object "Status information", Page 124

Options	
No	The group object is not enabled.
Yes	The group object is enabled.

7.3.5 Enable central Switch group object

This parameter can be used to enable the central Switch group object Switch . All assigned outputs can be activated together with the central Switch group object.

Observe the maximum number of switching cycles per minute when using the central switching group object → Technical data.

Options	
No	The group object is not enabled.
Yes	The group object is enabled.

7.3.6 Enable central Scene group object

This parameter can be used to enable the central Scene group object Scene 1 … 64 . All outputs assigned to the scene can be activated together with the central Scenes group object.

Observe the maximum number of switching cycles per minute when using the central Scenes group object → Technical data.

Options	
No	The group object is not enabled.
Yes	The group object is enabled.

7.3.7 Enable group object "In operation"

This parameter can be used to enable the group object In operation .

The group object reports the presence of the device on the ABB i-bus® KNX and can be monitored by an external device. If a telegram is not received, the device may be defective or the bus cable to the transmitting device may be interrupted. The dependent parameter Sending cycle can be used to set the cycle during which the group object sends a telegram.

Options	
No	The group object is not enabled.
Yes, send value 0 cyclically	The group object is enabled and cyclically sends the value 0.
Yes, send value 1 cyclically	The group object is enabled and cyclically sends the value 1.

7.4 Parameter window Safety

The safety and weather alarms can be activated and set in Parameter window Safety.

The safety alarms apply to the entire device, but each output can react differently to receipt of a safety alarm. The reaction of the individual outputs can be defined in the respective parameter windows.

More information → Safety functions, Page 86.

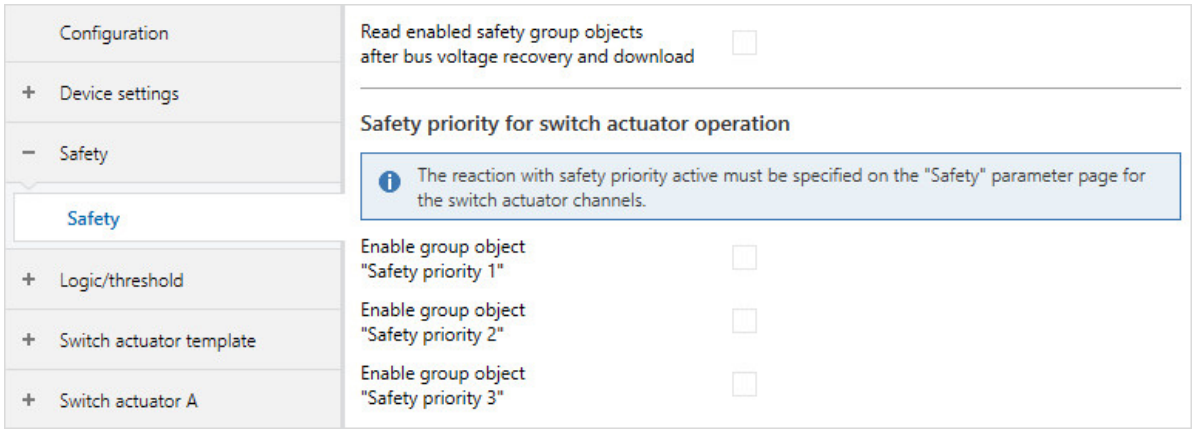


Fig. 43: Parameter window Safety

Parameter

- Read enabled safety group objects after bus voltage recovery and download
- Enable group object "Safety priority x"

7.4.1 Read enabled safety group objects after bus voltage recovery and download

This parameter can be used to define whether the following, enabled safety group objects are read after bus voltage recovery:

- Safety priority x

Options	
No	The enabled safety group objects are not read after bus voltage recovery.
Yes	The enabled safety group objects are read after bus voltage recovery. If alarms are present, the parameterized events take place.

Options	
No	
Yes	The read flags must be set for the corresponding group objects of the sending device.

7.4.2 Enable group object "Safety priority x"

These parameters can be used to enable the group objects Safety priority x (x = 1, 2, 3). The group objects apply to the entire device, but each output can react differently to receipt of a safety priority. The reaction of the respective output can be set in the Parameter window Safety.

Options	
No	The group object is not enabled.
Yes	The group object is enabled.

7.5 Parameter window Logic/Threshold 1

Note
The parameter windows and the structure of the parameters are identical for all Logic/Threshold functions. Therefore, only one parameter window will be described below by way of example.

Note
This parameter window is visible only if, in the Parameter window Configuration, the following option is set for the parameter Enable Logic/Threshold X-Y: *Yes*.

The Parameter window Logic/Threshold 1 can be used to make all settings for the *Logic/Threshold* functions.

The *Logic/Threshold* functions can be used independently of the other device functions. The result of the *Logic/Threshold* function can be internally linked with any output and/or sent on the ABB i-bus® KNX.

More information → Function Logic, Page 88, → Function Threshold, Page 88.

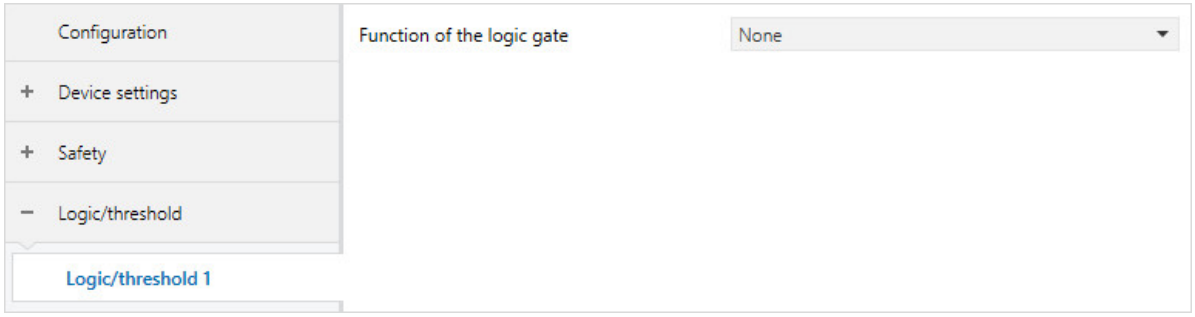


Fig. 44: Parameter window Logic/Threshold 1

Parameter

- Function of the logic gate
  - Group object "Connection A" after bus voltage recovery
  - Group object "Connection B" after bus voltage recovery
  - Invert result
  - Send result on KNX
    - Send value of group object
    - Send value of group object
    - Send value of group object
    - Send value of group object
  - Data type of group object "Threshold input"
  - Upper threshold
  - Lower threshold
  - Change thresholds via KNX
  - Result if upper threshold is exceeded
  - Min. duration of the overshoot
  - Result if the input value is between the thresholds
  - Minimum dwell time between the thresholds
  - Result if lower threshold is dropped below
  - Min. duration of the undershoot
  - Update result after each overshoot/undershoot
  - Send result on KNX
    - Send value of group object

7.5.1 Function of the logic gate

This parameter can be used to define whether a logic function or the threshold function is used.

Options	
None	The logic gate is not used.
AND	The logic function *AND* is used. If the value 1 is present on both inputs, the result = 1. The result can be inverted, linked with any output within the device or output on the group object Result . The following group objects will be enabled: • Connection A • Connection B • Group object "Connection A" after bus voltage recovery • Group object "Connection B" after bus voltage recovery • Invert result • Send result on KNX
OR	The logic function *OR* is used. If the value 1 is present on at least one input, the result = 1. The result can be inverted, linked with any output within the device or output on the group object Result . The following group objects will be enabled: • Connection A • Connection B • Group object "Connection A" after bus voltage recovery • Group object "Connection B" after bus voltage recovery • Invert result • Send result on KNX
Exclusive OR	The logic function *exclusive OR* is used. If different values are present on both inputs, the result = 1. The result can be inverted, linked with any output within the device or output on the group object Result . The following group objects will be enabled: • Connection A • Connection B • Group object "Connection A" after bus voltage recovery • Group object "Connection B" after bus voltage recovery • Invert result • Send result on KNX
GATE	The logic function *GATE* is used. As long as GATE is activated, the most recent value sent to the input (Connection B) remains as the result. After disabling (Connection A), the value that the result had before disabling is retained. After enabling, the result corresponds to the value of the input (Connection B). The result can be inverted, linked with any output within the device or output on the group object Result . The following group objects will be enabled: • Connection A • Connection B • Group object "Connection A" after bus voltage recovery • Group object "Connection B" after bus voltage recovery • Invert result • Send result on KNX
Threshold	The function *Threshold* is used. More information → Function Threshold, Page 88. • Data type of group object "Threshold input" • Upper threshold • Lower threshold • Change thresholds via KNX • Result if upper threshold is exceeded • Min. duration of the overshoot • Result if the input value is between the thresholds • Minimum dwell time between the thresholds • Result if lower threshold is dropped below • Min. duration of the undershoot • Update result after each overshoot/undershoot • Send result on KNX

7.5.1.1 —

DEPENDENT PARAMETER

Group object "Connection A" after bus voltage recovery

This parameter can be used to define the value that will be written to the group object Connection A after bus voltage recovery.

Options	
1	The value 1 is written to the group object, but does not pass through the function *Logic*. Writing the group object does not affect the result of the function *Logic*.
0	The value 0 is written to the group object, but does not pass through the function *Logic*. Writing the group object does not affect the result of the function *Logic*.

Condition for visibility:
Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *AND*

7.5.1.2 —

DEPENDENT PARAMETER

Group object "Connection B" after bus voltage recovery

This parameter can be used to define the value that will be written to the group object Connection B after bus voltage recovery.

Options	
1	The value 1 is written to the group object, but does not pass through the function *Logic*. Writing the group object does not affect the result of the function *Logic*.
0	The value 0 is written to the group object, but does not pass through the function *Logic*. Writing the group object does not affect the result of the function *Logic*.

Condition for visibility:
Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *AND*

7.5.1.3 —

DEPENDENT PARAMETER

Invert result

This parameter can be used to define whether the result of the function *Logic* will be output inverted.

Options	
No	The result of the function *Logic* will not be output inverted.
Yes	The result of the function *Logic* will be output inverted.

Condition for visibility:
Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *AND*

7.5.1.4 —

DEPENDENT PARAMETER

Send result on KNX

This parameter can be used to define whether the result of the function *Logic* will be written to the group object Result .

Options	
No	The result is not output on the ABB i-bus® KNX.
Yes	The result is output on the ABB i-bus® KNX. The group object Result is enabled. The group object sending behavior can be defined in the parameter Send value of group object. • Send value of group object

Condition for visibility:
Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *AND*

7.5.1.4.1 —

DEPENDENT PARAMETER

Send value of group object

This parameter can be used to define whether the value of the group object will be sent to the ABB i-bus® KNX.

Options	
No, update only	The value of the group object is updated but not sent.
After change	The value of the group object is sent after every change.
On request	The value of the group object is sent on request. A request can be triggered by sending the value 0 or 1 on the group object Request status values .
After change or on request	The value of the group object is sent after a change or on request. A request can be triggered by sending the value 0 or 1 on the group object Request status values .

Condition for visibility:
Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *AND* \ Parameter Send result on KNX \ Option *Yes*

7.5.1.5 —

DEPENDENT PARAMETER

Data type of group object "Threshold input"

This parameter can be used to define the data type that is received via the group object Threshold input and evaluated.

Depending on the option selected, one of the following group objects is enabled:
- Threshold input (DPT 5.001)
- Threshold input (DPT 5.010)
- Threshold input (DPT 7.001)
- Threshold input (DPT 9.001)
- Threshold input (DPT 9.004)

Options
Percent (DPT5.001)
Meter pulses (DPT5.010)
Meter pulses (DPT7.001)
Temperature (DPT9.001)
Lux (DPT9.004)

Condition for visibility:
Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold*

7.5.1.6 —

DEPENDENT PARAMETER

Upper threshold

This parameter is used to define the upper threshold. Default values and units depend on the option selected in the Data type of group object "Threshold input" parameter.

Options
0 ... 50 ... 100 %
0 ... 200 ... 255
0 ... 40000 ... 65535
0 ... 22 ... 250 °C
0 ... 400 ... 100,000 lux

Condition for visibility:
Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold*

7.5.1.7 —

DEPENDENT PARAMETER

Lower threshold

This parameter is used to define the lower threshold. Default values and units depend on the option selected in the Data type of group object "Threshold input" parameter.

Options
0 ... 20 ... 100 %
0 ... 100 ... 255
0 ... 10000 ... 65535
0 ... 18 ... 250 °C
0 ... 100 ... 100,000 lux

Condition for visibility:
Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold*

7.5.1.8 —

DEPENDENT PARAMETER

Change thresholds via KNX

This parameter defines whether the thresholds set in ETS can be changed via the ABB i-bus® KNX.

Options	
No	Upper and lower thresholds can be set only in ETS.
Yes	The upper and lower thresholds can be changed via the ABB i-bus® KNX. The following group objects are enabled depending on the settings in the parameter Data type of group object "Threshold input": • Change upper threshold (DPT 5.001) • Change upper threshold (DPT 5.010) • Change upper threshold (DPT 7.001) • Change upper threshold (DPT 9.001) • Change upper threshold (DPT 9.004) • Change lower threshold (DPT 5.001) • Change lower threshold (DPT 5.010) • Change lower threshold (DPT 7.001) • Change lower threshold (DPT 9.001) • Change lower threshold (DPT 9.004)

Condition for visibility:
Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold*

7.5.1.9 —

DEPENDENT PARAMETER

Result if upper threshold is exceeded

This parameter can be used to define the result of the function *Threshold* when the value received at the threshold input exceeds the upper threshold. The result can be linked with any output within the device or output on the group object Result .

Options	
Unchanged	The result of the function *Threshold* remains unchanged.
1	The result of the function *Threshold* is 1.
0	The result of the function *Threshold* is 0.

Condition for visibility:
Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold*

7.5.1.10 —

DEPENDENT PARAMETER

Min. duration of the overshoot

This parameter can be used to set how long the value received at the threshold input must exceed the threshold before the result of the function *Threshold* is updated.

Options
00:00:00 … 18:12:15 hh:mm:ss

Condition for visibility:
Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold*

7.5.1.11 —

DEPENDENT PARAMETER

Result if the input value is between the thresholds

This parameter can be used to define the result of the function *Threshold* when the value received at the threshold input lies between the upper and lower thresholds. The result can be linked with any output within the device or output on the group object Result .

Options	
Unchanged	The result of the function *Threshold* remains unchanged.
1	The result of the function *Threshold* is 1.
0	The result of the function *Threshold* is 0.

Condition for visibility:
Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold*

7.5.1.12 —

DEPENDENT PARAMETER

Minimum dwell time between the thresholds

This parameter can be used to define how long the value received at the threshold input must remain between the upper and lower thresholds before the result of the function *Threshold* is updated.

Options
00:00:00 … 18:12:15 hh:mm:ss

Condition for visibility:
Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold*

7.5.1.13 —

DEPENDENT PARAMETER

Result if lower threshold is dropped below

This parameter can be used to define the result of the function *Threshold* when the value received at the threshold input falls below the lower threshold. The result can be linked with any output within the device or output on the group object Result .

Options	
Unchanged	The result of the function *Threshold* remains unchanged.
1	The result of the function *Threshold* is 1.
0	The result of the function *Threshold* is 0.

Condition for visibility:
Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold*

7.5.1.14 —

DEPENDENT PARAMETER

Min. duration of the undershoot

This parameter can be used to define how long the value received at the threshold input must fall below the threshold before the result of the function *Threshold* is updated.

Options
00:00:00 … 18:12:15 hh:mm:ss

Condition for visibility:
Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold*

7.5.1.15 —

DEPENDENT PARAMETER

Update result after each overshoot/undershoot

This parameter can be used to define whether the result of the function *Threshold* is updated whenever the value received at the threshold input exceeds or falls below a threshold.

Options	
No	The result of the function *Threshold* is updated only if the received value triggers a result change.
Yes	The result of the function *Threshold* is updated when the received value exceeds or falls below a threshold.

Condition for visibility:
Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold*

7.5.1.16 —

DEPENDENT PARAMETER

Send result on KNX

This parameter can be used to define whether the result of the function *Threshold* will be written to the group object Result .

Options	
No	The result is not output on the ABB i-bus® KNX.
Yes	The result is output on the ABB i-bus® KNX. The group object Result is enabled. The group object sending behavior can be defined in the parameter Send value of group object. • Send value of group object

Condition for visibility:
Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold*

7.5.1.16.1 —

DEPENDENT PARAMETER

Send value of group object

This parameter can be used to define whether the value of the group object will be sent to the ABB i-bus® KNX.

Options	
No, update only	The value of the group object is updated but not sent.
After change	The value of the group object is sent after every change.
On request	The value of the group object is sent on request. A request can be triggered by sending the value 0 or 1 on the group object Request status values .
After change or on request	The value of the group object is sent after a change or on request. A request can be triggered by sending the value 0 or 1 on the group object Request status values .

Condition for visibility:
Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold* \ Parameter Send result on KNX \ Option *Yes*

7.6 Parameter window Switch Actuator template

The functions can be set for all Switch Actuator outputs in the Parameter window Switch Actuator template.

It can be decided for each Switch Actuator output whether parameterization from the template is used. The individual setting of a Switch Actuator output is made in the respective Parameter window Switch Actuator A.

As the Parameter window Switch Actuator template and Parameter window Switch Actuator A are nearly identical in structure, the individual parameters will be described in the Parameter window Switch Actuator A.

7.7 Parameter window Switch Actuator A

Note
The parameter windows and the structure of the parameters are identical for all outputs. Therefore, only one output will be described below by way of example.

The functions can be set individually for each Shutter Actuator output inParameter window Switch Actuator A and the subordinate parameter windows.

Note
If several Shutter Actuator outputs are to be set to the same values, parameterization can be performed in Parameter window Switch Actuator template.

7.7.1 Parameter window Functions

The following settings can be made in the Parameter window Functions:

- Enabling of functions

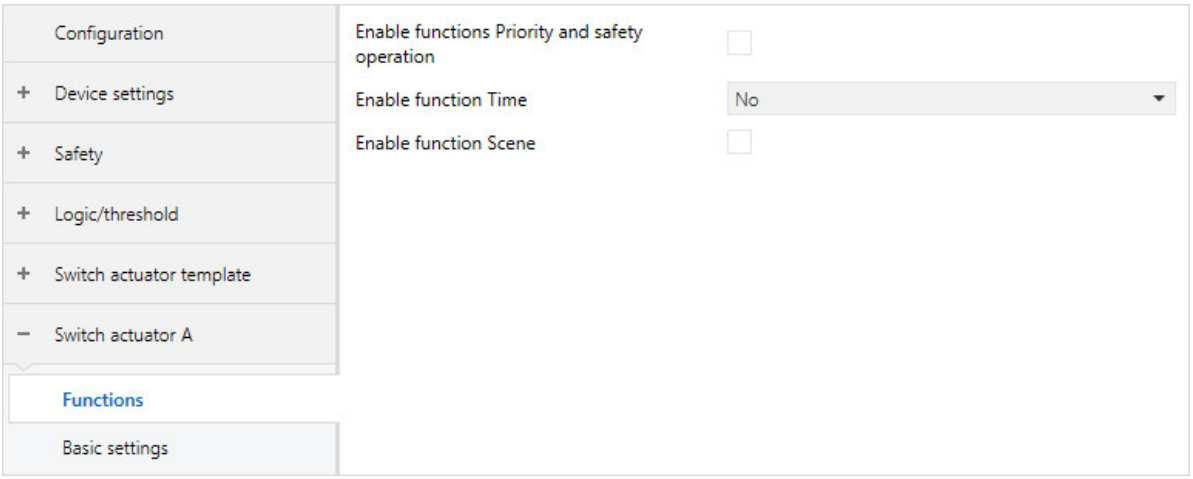


Fig. 45: Parameter window Functions

Parameter

- Enable function Scenes
- Enable function Safety
- Enable function Time

7.7.1.1 Enable function Scenes

This parameter can be used to enable the function *Scenes*, the associated Parameter window Scene assignment and the group object Scene 1…64 . The scene assignments and the reaction on scene retrieval are defined in Parameter window Scene assignment.

Options
No
Yes

7.7.1.2 Enable function Safety

This parameter can be used to enable the function *Safety* and the associated Parameter window Safety. The output response is defined in Parameter window Safety.

Options
No
Yes

7.7.1.3 Enable function Time

This parameter can be used to enable one of the following time functions:
- Staircase lighting
- Delay for switching ON and OFF
- Flashing

Depending on the selected function, Parameter window Staircase lighting is enabled with the group object Staircase lighting permanent ON and the Parameter window Delay for switching ON and OFF or the Parameter window Flashing with the group objectFlashing . The output response is defined in the corresponding parameter window.

Options	
No	No time function is used for this output.
Staircase lighting	The *Staircase lighting* time function is used for this output. The Parameter window Staircase lighting and the group object Staircase lighting permanent ON are enabled.
Delay for switching ON and OFF	The time function *Delay for switching ON and OFF* is used for this output. The Parameter window Delay for switching ON and OFF is enabled.
Flashing	The *Flashing* time function is used for this output. The Parameter window Flashing and the group object Flashing are enabled.

7.7.2 Parameter window Basic settings

The following settings can be made in the Parameter window Basic settings:

- Reaction of output
- Connection with the central group object Switch
- Link with the function *Logic/Threshold*
- Feedback of switching state
- Enabling of group object Status information
- Reaction on bus voltage failure, bus voltage recovery and download

> **Note**
> If several Shutter Actuator outputs are to be set to the same values, parameterization can be performed in Parameter window Switch Actuator template.

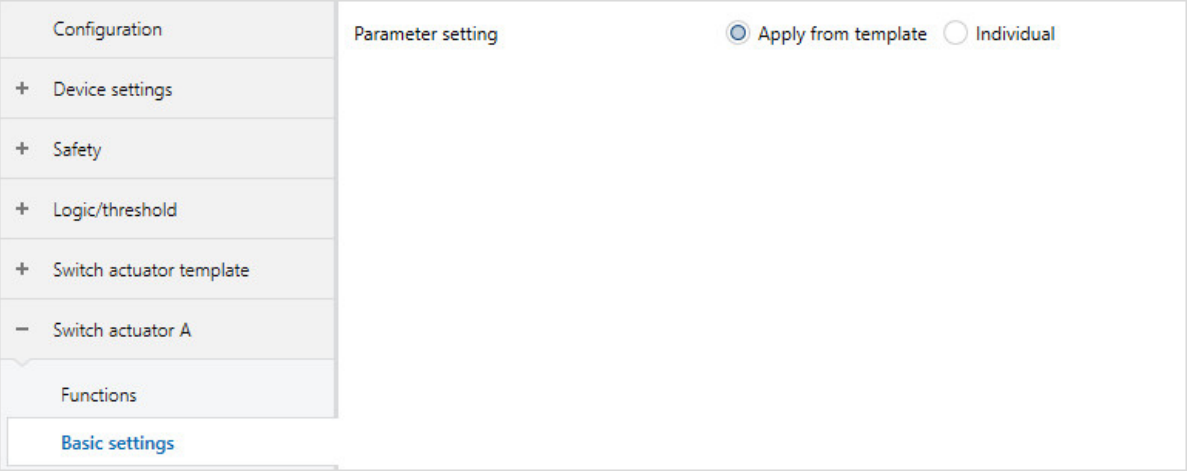


Fig. 46: Parameter window Basic settings

Parameter

- Parameter setting
  - Reaction of output
  - Switch output reacts to central Switch group object
  - Output reacts to
    - Reaction on result "0"
    - Reaction on result "1"
  - Feedback of switching state via group object "Status switch"
    - Value of group object "Status switch"
    - Send value of group object
  - Enable group object "Status information"
    - Send value of group object
  - Reaction on bus voltage failure
  - Reaction after bus voltage recovery
  - Reaction after ETS download

7.7.2.1 Parameter setting

This parameter can be used to define whether the settings for the parameter window are adopted from the template or each parameter is set individually.

Options	
Apply from template	The parameterization is adopted from the template for each parameter.
Individual	Parameters can be set individually. • Reaction of output • Switch output reacts to central Switch group object • Output reacts to • Feedback of switching state via group object "Status switch" • Enable group object "Status information" • Reaction on bus voltage failure • Reaction after bus voltage recovery • Reaction after ETS download

7.7.2.1.1 —

DEPENDENT PARAMETER

Reaction of output

This parameter can be used to set how the output reacts on receipt of a switching telegram on the group object Switch .

Options	
NC contact	The contact is opened with an On telegram (1) and closed with an Off telegram (0).
NO contact	The contact is closed with an On telegram (1) and opened with an Off telegram (0).

Condition for visibility:
Parameter window Basic settings \ Parameter Parameter setting \ Option *Individual*

7.7.2.1.2 —

DEPENDENT PARAMETER

Switch output reacts to central Switch group object

This parameter can be used to define whether the output can be switched via the central group object Switch

Note
This parameter is visible only if, in the Parameter window Device settings, the following option was set for the parameter Enable central Switch group object: *Yes*.

Options
No
Yes

Condition for visibility:
Parameter window Basic settings \ Parameter Parameter setting \ Option *Individual*

7.7.2.1.3 —

DEPENDENT PARAMETER

Output reacts to

This parameter can be used to define whether the output is influenced by the result of a *Logic* or *Threshold* function.

More information → Function Logic, Page 88, → Function Threshold, Page 88.

Options	
No Logic/Threshold function	The output does not react to a *Logic* or *Threshold* function.
Logic/Threshold x	The output reacts to the *Logic* or *Threshold* function x (x = 1 … 24). • Reaction on result "0" • Reaction on result "1"

Condition for visibility:
Parameter window Basic settings \ Parameter Parameter setting \ Option *Individual*

7.7.2.1.3.1 —

DEPENDENT PARAMETER

Reaction on result "0"

This parameter can be used to define how the output reacts when the result of the *Logic* or *Threshold* function is 0.

Options	
No reaction	The relay switching position remains unchanged.
ON	The result acts like an On telegram on the group object Switch . The relay contact position depends on the setting of the output as an *NC contact* or *NO contact*.
OFF	The result acts like an Off telegram on the group object Switch . The relay contact position depends on the setting of the output as an *NC contact* or *NO contact*.

Condition for visibility:
Parameter window Basic settings \ Parameter Parameter setting \ Option *Individual* \ Parameter Output reacts to \ Option *Logic/Threshold x*

7.7.2.1.3.2 —

DEPENDENT PARAMETER

Reaction on result "1"

This parameter can be used to define how the output reacts when the result of the *Logic* or *Threshold* function is 1.

Options	
No reaction	The relay switching position remains unchanged.
ON	The result acts like an On telegram on the group object Switch . The relay contact position depends on the setting of the output as an *NC contact* or *NO contact*.
OFF	The result acts like an Off telegram on the group object Switch . The relay contact position depends on the setting of the output as an *NC contact* or *NO contact*.

Condition for visibility:
Parameter window Basic settings \ Parameter Parameter setting \ Option *Individual* \ Parameter Output reacts to \ Option *Logic/Threshold x*

7.7.2.1.4 —

DEPENDENT PARAMETER

Feedback of switching state via group object "Status switch"

This parameter can be used to define whether the relay contact position is signaled via the group object Status Switch .

Options	
No	The group object Status Switch is not enabled.
Yes	The group object Status Switch is enabled. • Value of group object "Status switch" • Send value of group object

Condition for visibility:
Parameter window Basic settings \ Parameter Parameter setting \ Option *Individual*

7.7.2.1.4.1 —

DEPENDENT PARAMETER

Value of group object "Status switch"

This parameter can be used to define the value that the group object Status Switch assumes depending on the relay switching state. This can serve to invert the value of the group object.

Options	
1: closed, 0: open	The group object has the value 1 when the relay contact is closed. The group object has the value 0 when the relay contact is open.
0: closed, 1: open	The group object has the value 0 when the relay contact is closed. The group object has the value 1 when the relay contact is open.

Condition for visibility:
Parameter window Basic settings \ Parameter Parameter setting \ Option *Individual* \ Parameter Feedback of switching state via group object "Status switch" \ Option *Yes*

7.7.2.1.4.2 —

DEPENDENT PARAMETER

Send value of group object

This parameter can be used to define whether the value of the group object will be sent to the ABB i-bus® KNX.

Options	
No, update only	The value of the group object is updated but not sent.
After change	The value of the group object is sent after every change.
On request	The value of the group object is sent on request. A request can be triggered by sending the value 0 or 1 on the group object Request status values .
After change or on request	The value of the group object is sent after a change or on request. A request can be triggered by sending the value 0 or 1 on the group object Request status values .

Condition for visibility:
Parameter window Basic settings \ Parameter Parameter setting \ Option *Individual* \ Parameter Feedback of switching state via group object "Status switch" \ Option *Yes*

7.7.2.1.5 —

DEPENDENT PARAMETER

Enable group object "Status information"

This parameter can be used to enable the group object Status information . This group object can be used to send or request the device's status.

More information Code table for 8-bit status byte (Switch).

Options	
No	The group object is not enabled.
Yes	The group object is enabled. • Send value of group object

Condition for visibility:
Parameter window Basic settings \ Parameter Parameter setting \ Option *Individual*

7.7.2.1.5.1 —

DEPENDENT PARAMETER

Send value of group object

This parameter can be used to define whether the value of the group object will be sent to the ABB i-bus® KNX.

Options	
No, update only	The value of the group object is updated but not sent.
After change	The value of the group object is sent after every change.
On request	The value of the group object is sent on request. A request can be triggered by sending the value 0 or 1 on the group object Request status values .
After change or on request	The value of the group object is sent after a change or on request. A request can be triggered by sending the value 0 or 1 on the group object Request status values .

Condition for visibility:
Parameter window Basic settings \ Parameter Parameter setting \ Option *Individual* \ Parameter Enable group object "Status information" \ Option *Yes*

7.7.2.1.6 —

DEPENDENT PARAMETER

Reaction on bus voltage failure

This parameter can be used to define the reaction of the output in case of bus voltage failure.

Options	
Contact unchanged	The relay contact position remains unchanged.
Contact open	The relay contact is opened.
Contact closed	The relay contact is closed.

Condition for visibility:
Parameter window Basic settings \ Parameter Parameter setting \ Option *Individual*

7.7.2.1.7 —

DEPENDENT PARAMETER

Reaction after bus voltage recovery

This parameter can be used to define which value (if any) is written to the group object Switch and affects the output reaction after bus voltage recovery.

Note
With the Logic/Threshold, Disable and Forced Operation functions or the safety priority, writing the group object Switch does not necessarily result in a changed contact position.
The value of group object Switch can be read correctly only after a new value has been received via the ABB i-bus® KNX.

Options	
Write group object "Switch" with 0	The value of the group object Switch is overwritten with the value 0.
Write group object "Switch" with 1	The value of the group object Switch is overwritten with the value 1.
Do not write group object "Switch"	The value of group object Switch is not overwritten.

Condition for visibility:
Parameter window Basic settings \ Parameter Parameter setting \ Option *Individual*

7.7.2.1.8 —

DEPENDENT PARAMETER

Reaction after ETS download

This parameter can be used to define which value (if any) is written to the group object Switch and affects the output reaction after an ETS download.

Note
With the Logic/Threshold, Disable and Forced Operation functions or the safety priority, writing the group object Switch does not necessarily result in a changed contact position.
The value of group object Switch can be read correctly only after a new value has been received via the ABB i-bus® KNX.

Options	
Write group object "Switch" with 0	The value of the group object Switch is overwritten with the value 0.
Write group object "Switch" with 1	The value of the group object Switch is overwritten with the value 1.
Do not write group object "Switch"	The value of group object Switch is not overwritten.

Condition for visibility:
Parameter window Basic settings \ Parameter Parameter setting \ Option *Individual*

7.7.3 Parameter window Safety

> **Note**
> This parameter window is visible only if, in the Parameter window Functions, the following option is set for the parameter Enable function Safety: *Yes*.

The following settings can be made in the Parameter window Safety:
- Reaction to safety priorities
- Reaction on *Disable* and *Forced operation* functions
- Switching state after cancellation of the *Disable* and *Forced operation* functions and safety priorities

The order of priority of safety functions is as shown in the parameter window and cannot be changed:
a) Safety priority 1
b) Forced operation
c) Safety priority 2
d) Safety priority 3
e) Disable

More information → Switch Actuator safety functions, Page 86.

> **Note**
> If several Shutter Actuator outputs are to be set to the same values, parameterization can be performed in Parameter window Switch Actuator template.

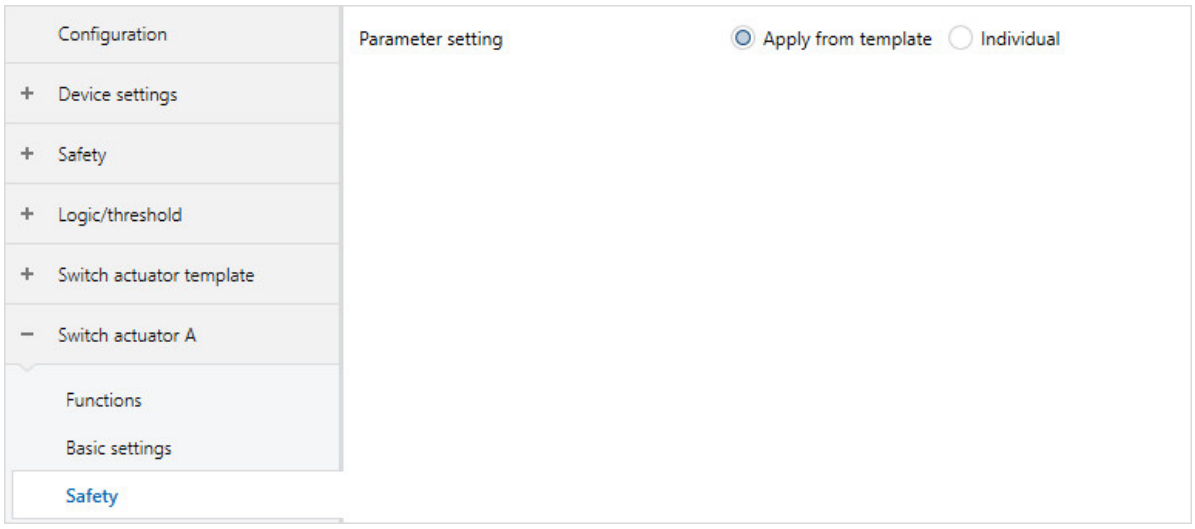


Fig. 47: Parameter window Safety

Parameter
- Parameter setting
  - Switching status for safety priority x
  - Forced operation (1 bit / 2 bit)
    - Switching status during forced operation
  - Disable
  - Switching state on cancellation of disabling, forced operation and safety priority

7.7.3.1 Parameter setting

This parameter can be used to define whether the settings for the parameter window are adopted from the template or each parameter is set individually.

Options	
Apply from template	The parameterization is adopted from the template for each parameter.
Individual	Parameters can be set individually. • Switching status for safety priority x • Forced operation (1 bit / 2 bit) • Disable • Switching state on cancellation of disabling, forced operation and safety priority

7.7.3.1.1 —

DEPENDENT PARAMETER

Switching status for safety priority x

This parameter can be used to define the relay switching position in case of safety priority.

More information → Safety priority, Page 86.

Note
This parameter is visible only if, in the Parameter window Safety, the following option was set for the parameter Enable group object "Safety priority x": *Yes*.

Note
In case of a safety priority, the output cannot be operated via other group objects or the i-bus® Tool until the safety priority is canceled.
Higher-priority safety functions will continue to run.

Options	
No reaction/deactivated	The relay switching position remains unchanged. The output does not react to the safety priority.
ON	The relay switching position is On.
OFF	The relay switching position is Off.
Unchanged (disable)	The relay switching position remains unchanged and is disabled in this position.

Options	
No reaction/deactivated	
ON	
OFF	
Unchanged (disable)	As long as disabling is active, the relay switching position cannot be changed via group objects, manual operation or the i-bus® Tool. Higher-priority safety functions will continue to run.

Condition for visibility:
Parameter window Safety \ Parameter Parameter setting \ Option *Individual*

7.7.3.1.2 —

DEPENDENT PARAMETER

Forced operation (1 bit / 2 bit)

This parameter can be used to define whether 1-bit or 2-bit forced operation is used.

More information → Forced operation, Page 86.

Note
When the function *Forced operation* is active, the output can no longer be operated via other group objects or manual operation until forced operation has been canceled.
Higher-priority safety functions will continue to run.

Options	
Deactivated	The function *Forced operation* is deactivated.
Activated 1 bit – 0 active	1-bit forced operation is used and is activated when the value 0 is received. The group object Forced operation, 1-bit is enabled. • Switching status during forced operation
Activated 1 bit – 1 active	1-bit forced operation is used and is activated when the value 1 is received. The group object Forced operation, 1-bit is enabled. • Switching status during forced operation
Activated 2 bit	2-bit forced operation is used. The group object Forced operation, 2-bit is enabled. The value of the group object determines the switching state.

Condition for visibility:
Parameter window Safety \ Parameter Parameter setting \ Option *Individual*

7.7.3.1.2.1 —

DEPENDENT PARAMETER

Switching status during forced operation

This parameter can be used to define the relay switching position during forced operation.

Options	
ON	The relay switching position is On.
OFF	The relay switching position is Off.
Unchanged (disable)	The relay switching position remains unchanged and is disabled in this position.

Options	
ON	
OFF	
Unchanged (disable)	As long as disabling is active, the relay switching position cannot be changed via group objects, manual operation or the i-bus® Tool. Higher-priority safety functions will continue to run.

Condition for visibility:
Parameter window Safety \ Parameter Parameter setting \ Option *Individual* \ Parameter Forced operation (1 bit / 2 bit) \ Option *Activated 1 bit – 0 active*

7.7.3.1.3 —

DEPENDENT PARAMETER

Disable

This parameter can be used to enable the group object Disable and define the relay switching position when the value 1 is received on the group object Disable.

Note
As long as disabling is active, the relay switching position cannot be changed via group objects or the i-bus® Tool.
Higher-priority safety functions will continue to run.

Options	
No reaction	The function *Disable* is not used.
ON	The group object Disable is enabled. The relay is disabled in switching position On when the value 1 is received.
OFF	The group object Disable is enabled. The relay is disabled in switching position Off when the value 1 is received.
Unchanged (disable)	The group object Disable is enabled. The relay is disabled when the value 1 is received. The switching position is not changed.

Condition for visibility:
Parameter window Safety \ Parameter Parameter setting \ Option *Individual*

7.7.3.1.4 —

DEPENDENT PARAMETER

Switching state on cancellation of disabling, forced operation and safety priority

This parameter can be used to define the switching position that the relay assumes after cancellation of a safety priority or the *Disable* or *Forced operation* function.

Options	
No reaction	The relay switching position remains unchanged.
ON	The relay switching position is On.
OFF	The relay switching position is Off.
Refreshed KNX state	The refreshed KNX state is used. More information → Refreshed KNX state, Page 87.

Condition for visibility:
Parameter window Safety \ Parameter Parameter setting \ Option *Individual*

7.7.4 Parameter window Staircase lighting

Note
This parameter window is visible only if, in the Parameter window Functions, the following option is set for the parameter Enable function Time: *Staircase lighting*.

The following settings can be made in the Parameter window Staircase lighting:
- Duration and switching reaction of the function *Staircase lighting*
- Warning before the staircase lighting is switched off
- Disable function *Staircase lighting*
- Reaction after the function *Permanent ON* and bus voltage recovery

More information → Function Staircase lighting, Page 90.

Note
If several Shutter Actuator outputs are to be set to the same values, parameterization can be performed in Parameter window Switch Actuator template.

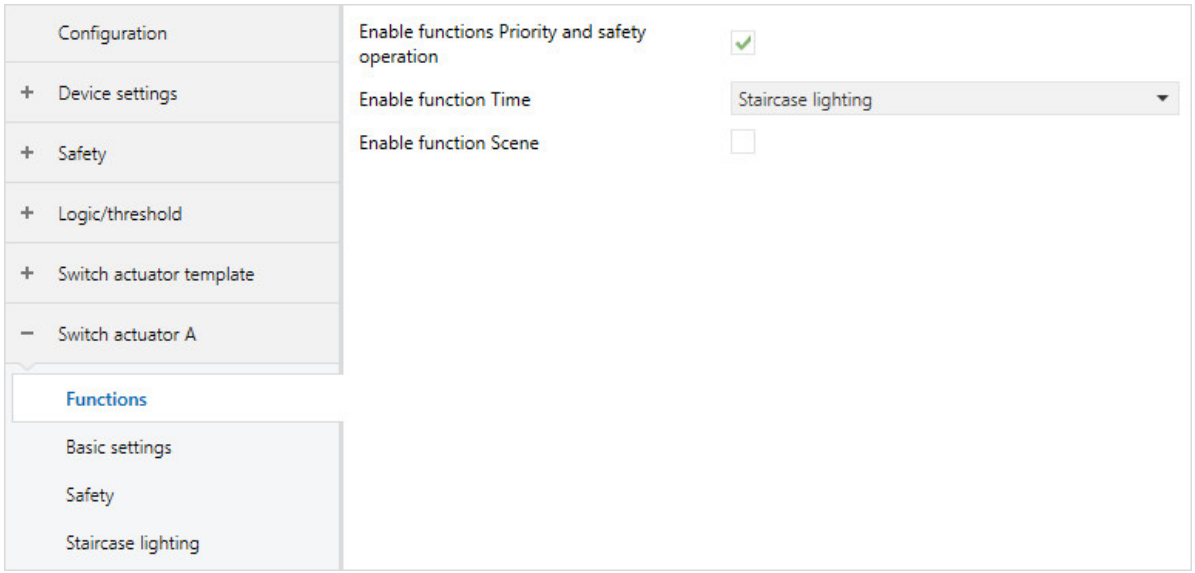


Fig. 48: Parameter window Staircase lighting

Parameter
- Parameter setting
  - Staircase lighting time
  - Staircase lighting can be started again
    - Staircase lighting time extendable (pumping)
  - Staircase lighting switchable
  - Warning before switching off the staircase lighting
    - Warning time
    - Quantity of Off/On changes
  - Disable staircase lighting via group object
    - Disable staircase lighting after bus voltage recovery
  - Change staircase lighting time via group object
  - Restart staircase lighting after end of permanent ON

7.7.4.1 Parameter setting

This parameter can be used to define whether the settings for the parameter window are adopted from the template or each parameter is set individually.

Options	
Apply from template	The parameterization is adopted from the template for each parameter.
Individual	Parameters can be set individually. • Staircase lighting time • Staircase lighting can be started again • Staircase lighting switchable • Warning before switching off the staircase lighting • Disable staircase lighting via group object • Change staircase lighting time via group object • Restart staircase lighting after end of permanent ON

7.7.4.1.1 —

DEPENDENT PARAMETER

Staircase lighting time

This parameter can be used to define how long the lighting remains switched on after an On telegram.

Options
00:00:00 … 00:05:00 … 18:12:15 hh:mm:ss

Condition for visibility:
Parameter window Staircase lighting \ Parameter Parameter setting \ Option *Individual*

7.7.4.1.2 —

DEPENDENT PARAMETER

Staircase lighting can be started again

This parameter can be used to define whether the staircase lighting time is extended by additional On telegrams.

Options	
No	Additional On telegrams will be ignored. The staircase lighting time will not be extended.
Yes	The staircase lighting time will be extended by additional On telegrams. The number of extensions can be set in the parameter Staircase lighting time extendable (pumping). More information → Function Staircase lighting, Page 90. • Staircase lighting time extendable (pumping)

Condition for visibility:
Parameter window Staircase lighting \ Parameter Parameter setting \ Option *Individual*

7.7.4.1.2.1 —

DEPENDENT PARAMETER

Staircase lighting time extendable (pumping)

This parameter can be used to define how often the staircase lighting time can be extended.

Options	
No, can only be started again	The staircase lighting time can be restarted any number of times by switching the lighting on again.
Up to max. 2x staircase lighting time	The staircase lighting time can be extended up to twice the duration. Extension occurs when additional switch-on commands are received after switch-on.
Up to max. 3x staircase lighting time	The staircase lighting time can be extended to three times the duration. Extension occurs when additional switch-on commands are received after switch-on.
Up to max. 4x staircase lighting time	The staircase lighting time can be extended to four times the duration. Extension occurs when additional switch-on commands are received after switch-on.
Up to max. 5x staircase lighting time	The staircase lighting time can be extended to five times the duration. Extension occurs when additional switch-on commands are received after switch-on.

Condition for visibility:
Parameter window Staircase lighting \ Parameter Parameter setting \ Option *Individual* \ Parameter Staircase lighting can be started again \ Option *Yes*

7.7.4.1.3 —

DEPENDENT PARAMETER

Staircase lighting switchable

This parameter can be used to define the telegram value with which the lighting is switched on and prematurely switched off.

Options	
ON with "1" and OFF with "0"	The lighting is switched on with the telegram value "1" and off with the telegram value "0".
ON with "1" no action for "0"	The lighting is switched on with the telegram value "1". Premature switch-off is not possible.
ON with "1" or with "0", no switch OFF	The lighting is switched on independently of the telegram value. Premature switch-off is not possible.

Condition for visibility:
Parameter window Staircase lighting \ Parameter Parameter setting \ Option *Individual*

7.7.4.1.4 —

DEPENDENT PARAMETER

Warning before switching off the staircase lighting

This parameter can be used to define whether the user will be warned before the lighting is switched off.

Options	
No	The user is not warned before the lighting is switched off.
Via group object	The group object Warning staircase lighting is enabled. The group object is set to the value 1 at the beginning of the Warning time. The group object is set to the value 0 when the warning time elapses. The group object can be used to switch a warning light. • Warning time
Via quick switching OFF/ON	The lighting is briefly switched off and then back on during the Warning time. The number of Off/On changes can be set in the parameter Quantity of Off/On changes. The first Off/On change takes place at the beginning of the warning time. Additional Off/On changes are uniformly distributed over the remaining warning time. • Quantity of Off/On changes • Warning time
Via object and quick switching ON/OFF	The user is warned before the lighting is switched off: • *Via group object* • *Via quick switching OFF/ON* • Quantity of Off/On changes • Warning time

Condition for visibility:
Parameter window Staircase lighting \ Parameter Parameter setting \ Option *Individual*

7.7.4.1.4.1 —

DEPENDENT PARAMETER

Warning time

This parameter can be used to set the duration of the warning time. The warning time is added to the Staircase lighting time.

Options
00:00:10 … 00:00:45 … 18:12:15 hh:mm:ss

Condition for visibility:
Parameter window Staircase lighting \ Parameter Parameter setting \ Option *Individual* \ Parameter Warning before switching off the staircase lighting \ Option *Via group object*

7.7.4.1.4.2 —

DEPENDENT PARAMETER

Quantity of Off/On changes

This parameter can be used to define the number of Off/On changes during the Warning time.

Options
1 … 2 … 5

Condition for visibility:
Parameter window Staircase lighting \ Parameter Parameter setting \ Option *Individual* \ Parameter Warning before switching off the staircase lighting \ Option *Via quick switching OFF/ON*

7.7.4.1.5 —

DEPENDENT PARAMETER

Disable staircase lighting via group object

This parameter can be used to define whether the function *Staircase lighting* can be disabled via the group object Disable staircase lighting . If the function *Staircase lighting* is disabled, the switch-on command is forwarded without time function in the function chain and the output reacts according to its parameterization.

Options	
No	The function *Staircase lighting* cannot be disabled.
Yes	The function *Staircase lighting* can be disabled. The group object Disable staircase lighting is enabled. • Disable staircase lighting after bus voltage recovery

Condition for visibility:
Parameter window Staircase lighting \ Parameter Parameter setting \ Option *Individual*

7.7.4.1.5.1 —

DEPENDENT PARAMETER

Disable staircase lighting after bus voltage recovery

This parameter can be used to define whether the function *Staircase lighting* is disabled after bus voltage recovery.

Options
No
Yes

Condition for visibility:
Parameter window Staircase lighting \ Parameter Parameter setting \ Option *Individual* \ Parameter Disable staircase lighting via group object \ Option *Yes*

7.7.4.1.6 —

DEPENDENT PARAMETER

Change staircase lighting time via group object

This parameter can be used to define whether the Staircase lighting time can be changed via the group object Staircase lighting time .

Note
Once it has begun, the function *Staircase lighting* is initially completed without change. The changed staircase lighting time is used only the next time the function *Staircase lighting* is retrieved.

Options	
No	The staircase lighting time cannot be changed via the group object.
Yes	The staircase lighting time can be changed via the group object. The group object Staircase lighting time is enabled.

Condition for visibility:
Parameter window Staircase lighting \ Parameter Parameter setting \ Option *Individual*

7.7.4.1.7

—

DEPENDENT PARAMETER

Restart staircase lighting after end of permanent ON

This parameter can be used to define how the function *Staircase lighting* reacts after the function *Permanent ON* is ended.

Options	
No	The lighting is switched off after the function *Permanent ON* is ended.
Yes	After the function *Permanent ON* is ended, the Staircase lighting time is started and the lighting remains switched on.

Condition for visibility:
Parameter window Staircase lighting \ Parameter Parameter setting \ Option *Individual*

7.7.5 Parameter window Delay for switching ON and OFF

Note
This parameter window is visible only if, in the Parameter window Functions, the following option is set for the parameter Enable function Time: *Delay for switching ON and OFF*.

The Parameter window Delay for switching ON and OFF can be used to set the reaction of the function *Delay for switching ON and OFF*.

More information → Function Delay for switching ON and OFF, Page 92.

Note
If several Shutter Actuator outputs are to be set to the same values, parameterization can be performed in Parameter window Switch Actuator template.

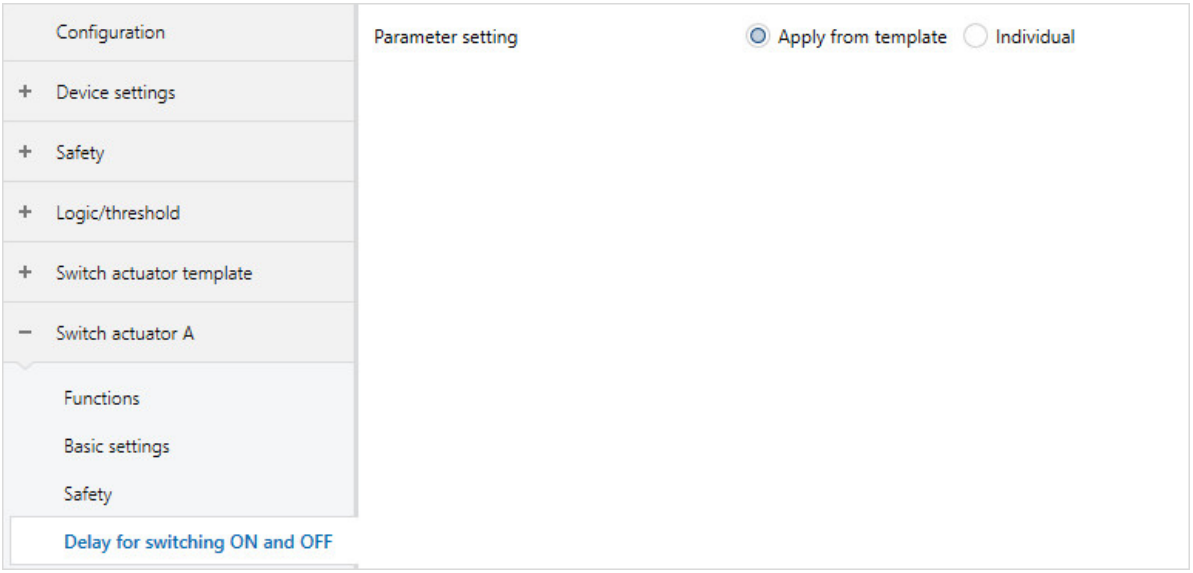


Fig. 49: Parameter window Delay for switching ON and OFF

Parameter

- Parameter setting
  - Delay for switching ON
  - Delay for switching OFF
  - Disable delay for switching ON and OFF via group object
    - Disable delay for switching ON and OFF after bus voltage recovery

7.7.5.1 Parameter setting

This parameter can be used to define whether the settings for the parameter window are adopted from the template or each parameter is set individually.

Options	
Apply from template	The parameterization is adopted from the template for each parameter.
Individual	Parameters can be set individually. • Delay for switching ON • Delay for switching OFF • Disable delay for switching ON and OFF via group object

7.7.5.1.1 —

DEPENDENT PARAMETER

Delay for switching ON

This parameter can be used to define the switch-on delay for the output after an On telegram is received.

NOTICE
If a delay is set for a scene assignment, the delay set here is not effective.

NOTICE
The delay parameterized here influences the result of the function *Logic/Threshold*.

More information → Function Delay for switching ON and OFF, Page 92

Options
00:00:00 … 18:12:15 hh:mm:ss

Condition for visibility:
Parameter window Delay for switching ON and OFF \ Parameter Parameter setting \ Option *Individual*

7.7.5.1.2 —

DEPENDENT PARAMETER

Delay for switching OFF

This parameter can be used to define the switch-off delay for the output after an Off telegram is received.

NOTICE
If a delay is set for a scene assignment, the delay set here is not effective.

NOTICE
The delay parameterized here influences the result of the function *Logic/Threshold*.

More information → Function Delay for switching ON and OFF, Page 92

Options
00:00:00 … 18:12:15 hh:mm:ss

Condition for visibility:
Parameter window Delay for switching ON and OFF \ Parameter Parameter setting \ Option *Individual*

7.7.5.1.3 —

DEPENDENT PARAMETER

Disable delay for switching ON and OFF via group object

This parameter can be used to define whether the function *Delay for switching ON and OFF* can be disabled via the group object Disable delay for switching ON and OFF . If the function *Delay for switching ON and OFF* is disabled, the switch-on command is forwarded without time function in the function chain and the output reacts according to its parameterization. Disabling remains in effect after a download.

Options	
No	The Delay for switching ON and OFF cannot be disabled via the group object Disable delay for switching ON and OFF .
Yes	The Delay for switching ON and OFF can be disabled via the group object Disable delay for switching ON and OFF ; the group object is enabled. • Disable delay for switching ON and OFF after bus voltage recovery

Condition for visibility:
Parameter window Delay for switching ON and OFF \ Parameter Parameter setting \ Option *Individual*

7.7.5.1.3.1 —

DEPENDENT PARAMETER

Disable delay for switching ON and OFF after bus voltage recovery

This parameter can be used to define whether the delay for switching ON and OFF is disabled after bus voltage recovery.

Options	
No	The delay for switching ON and OFF is not disabled after bus voltage recovery.
Yes	The delay for switching ON and OFF is disabled after bus voltage recovery.

Condition for visibility:
Parameter window Delay for switching ON and OFF \ Parameter Parameter setting \ Option *Individual* \ Parameter Disable delay for switching ON and OFF via group object \ Option *Yes*

7.7.6 Parameter window Flashing

Note
This parameter window is visible only if, in the Parameter window Functions, the following option is set for the parameter Enable function Time: *Flashing*.

The following settings can be made in the Parameter window Flashing:
- Duration and reaction of the *Flashing* function

More information → Function Flashing, Page 93.

Note
If several Shutter Actuator outputs are to be set to the same values, parameterization can be performed in Parameter window Switch Actuator template.

Note
Each relay can perform only a limited number of switching operations per minute. A large number of switching operations per minute can delay switching. Refer to the Technical data for more information.

Note
Pay attention to the service life of the switching contacts when using the function *Flashing*. Refer to the Technical data for more information.

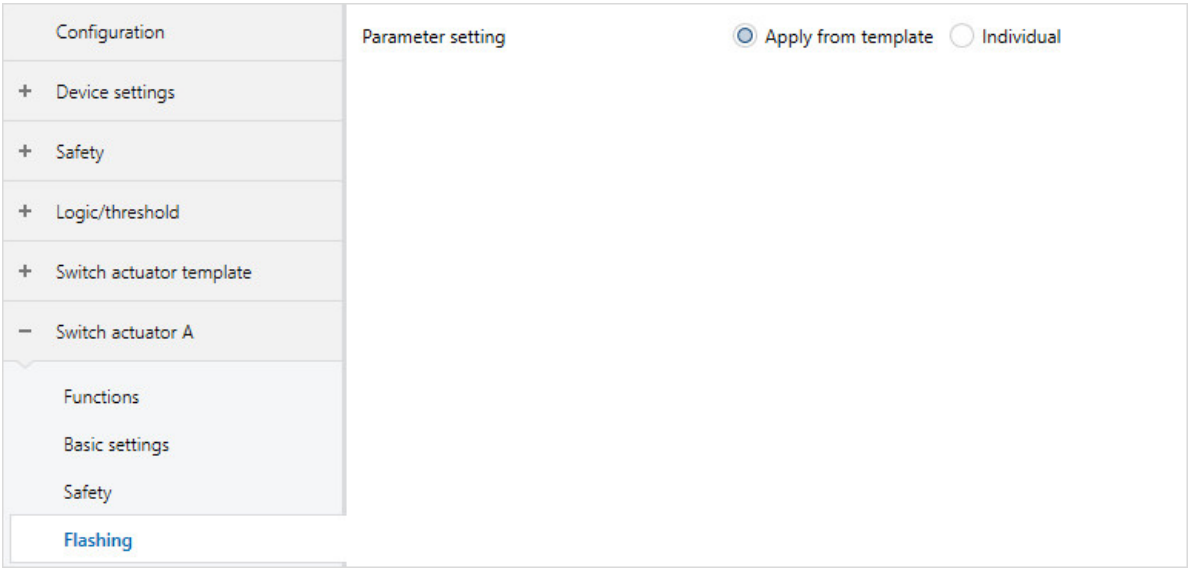


Fig. 50: Parameter window Flashing

Parameter
- Parameter setting
  - Flashing if group object Flashing equals
  - Time for ON
  - Time for OFF
  - Number of flashing cycles
  - Contact position after flashing

7.7.6.1 Parameter setting

This parameter can be used to define whether the settings for the parameter window are adopted from the template or each parameter is set individually.

Options	
Apply from template	The parameterization is adopted from the template for each parameter.
Individual	Parameters can be set individually. • Flashing if group object Flashing equals • Time for ON • Time for OFF • Number of flashing cycles • Contact position after flashing

7.7.6.1.1 —

DEPENDENT PARAMETER

Flashing if group object Flashing equals

This parameter can be used to define the telegram value on the group object Flashing at which the *Flashing* function is activated.

Options	
ON (1) or OFF (0)	A telegram with the value 1 or 0 triggers flashing. Flashing cannot be ended prematurely.
ON (1)	A telegram with the value 1 triggers flashing. A telegram with the value 0 ends flashing.
OFF (0)	A telegram with the value 0 triggers flashing. A telegram with the value 1 ends flashing.

Condition for visibility:
Parameter window Flashing \ Parameter Parameter setting \ Option *Individual*

7.7.6.1.2 —

DEPENDENT PARAMETER

Time for ON

This parameter can be used to define how long the output is switched on during an On/Off change.

Options
00:00:01 … 00:00:05 … 18:12:15 hh:mm:ss

Condition for visibility:
Parameter window Flashing \ Parameter Parameter setting \ Option *Individual*

7.7.6.1.3 —

DEPENDENT PARAMETER

Time for OFF

This parameter can be used to define how long the output is switched off during an On/Off change.

Options
00:00:01 … 00:00:05 … 18:12:15 hh:mm:ss

Condition for visibility:
Parameter window Flashing \ Parameter Parameter setting \ Option *Individual*

7.7.6.1.4 —

DEPENDENT PARAMETER

Number of flashing cycles

This parameter can be used to set the number of On/Off changes.

Options
0 … 5 … 100

Condition for visibility:
Parameter window Flashing \ Parameter Parameter setting \ Option *Individual*

7.7.6.1.5 —

DEPENDENT PARAMETER

Contact position after flashing

This parameter can be used to define the switching position the relay assumes after flashing.

Options	
OFF	The relay switching position is Off.
ON	The relay switching position is On.
Refreshed KNX state	The refreshed KNX state is used. More information → Refreshed KNX state, Page 87.

Condition for visibility:
Parameter window Flashing \ Parameter Parameter setting \ Option *Individual*

7.7.7 Parameter window Scene assignment

Note
This parameter window is visible only if, in the Parameter window Functions, the following option is set for the parameter Enable function Scenes: *Yes*.

Up to 16 different scenes can be created and assigned to the output in the Parameter window Scene assignment.

More information → Scenes, Page 89.

Note
If several Shutter Actuator outputs are to be set to the same values, parameterization can be performed in Parameter window Switch Actuator template.

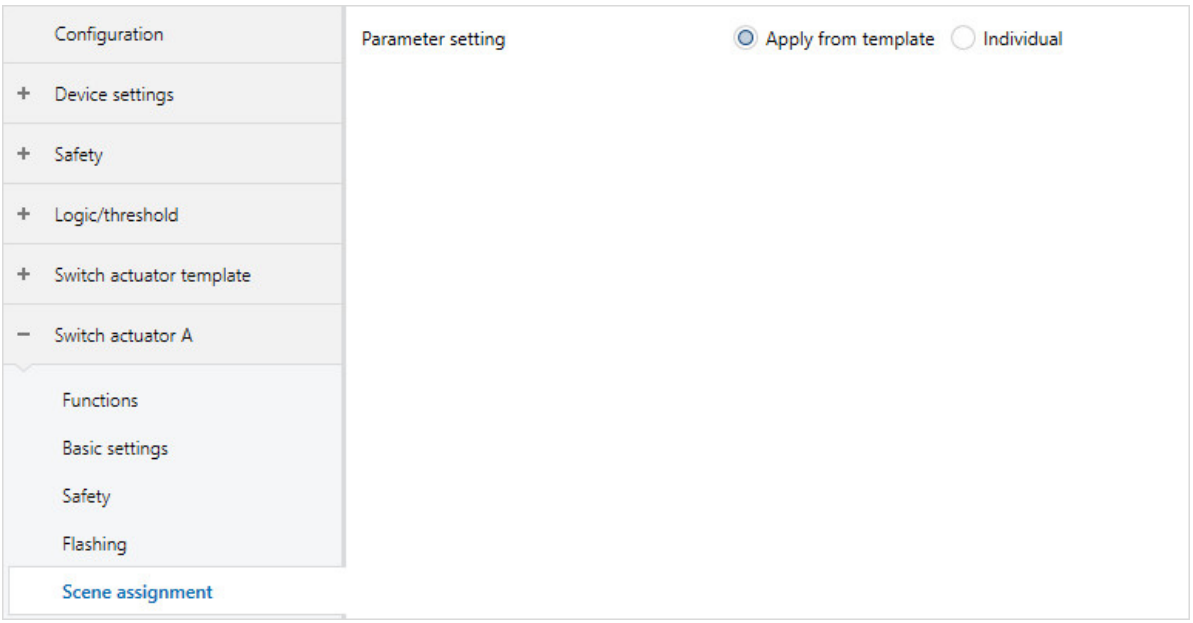


Fig. 51: Parameter window Scene assignment

Parameter

- Parameter setting
  - Overwrite scenes on download
  - Enable scene assignment x
    - Scene retrieval additionally via group object
    - Scene number
    - Delay
    - Action for scene

7.7.7.1 Parameter setting

This parameter can be used to define whether the settings for the parameter window are adopted from the template or each parameter is set individually.

Options	
Apply from template	The parameterization is adopted from the template for each parameter.
Individual	Parameters can be set individually. • Overwrite scenes on download • Enable scene assignment x

7.7.7.1.1 —

DEPENDENT PARAMETER

Overwrite scenes on download

This parameter can be used to define whether the scenes in the device are overwritten during a download.

Options
No
Yes

Condition for visibility:
Parameter window Scene assignment \ Parameter Parameter setting \ Option *Individual*

7.7.7.1.2 —

DEPENDENT PARAMETER

Enable scene assignment x

This parameter can be used to define whether the scene assignment x (x = 1 … 16) is used.

Note
The default value for scene assignment 2 … 16 is No. Scenes 2 … 16 can be enabled only one after the other.

Options
No
Yes

Condition for visibility:
Parameter window Scene assignment \ Parameter Parameter setting \ Option *Individual*

7.7.7.1.2.1 —

DEPENDENT PARAMETER

Scene retrieval additionally via group object

This parameter is available only for scene assignment 1 … 4.

This parameter can be used to define whether the scene assignment can be retrieved via the group object Retrieve scene assignment x as well.

Options
No
Yes

Condition for visibility:
Parameter window Scene assignment \ Parameter Parameter setting \ Option *Individual* \ Parameter Enable scene assignment x \ Option *Yes*

7.7.7.1.2.2 —

DEPENDENT PARAMETER

Scene number

The scene number (1 … 64) can be created and assigned to the output using this parameter.

Options
1 … 64

Condition for visibility:
Parameter window Scene assignment \ Parameter Parameter setting \ Option *Individual* \ Parameter Enable scene assignment x \ Option *Yes*

7.7.7.1.2.3 —

DEPENDENT PARAMETER

Delay

This parameter can be used to define the delay with which the associated reaction takes place after scene retrieval.

Note
The delay can be disabled with the group object Disable delay for switching ON and OFF .

Options
00:00:00 … 12:00:00 hh:mm:ss

Condition for visibility:
Parameter window Scene assignment \ Parameter Parameter setting \ Option *Individual* \ Parameter Enable scene assignment x \ Option *Yes*

7.7.7.1.2.4 —

DEPENDENT PARAMETER

Action for scene

This parameter can be used to define the relay switching position when the scene is retrieved.

Options	
ON	The relay switching position is On.
OFF	The relay switching position is Off.

Condition for visibility:
Parameter window Scene assignment \ Parameter Parameter setting \ Option *Individual* \ Parameter Enable scene assignment x \ Option *Yes*

8 Group objects

8.1 Overview of group objects

No.	Function	Group Object Name	Data Point Type	Length	Flags
1	*In operation*	Central: General	DPT 1.002	1 bit	C R T
2	*Request status values*	Central: General	DPT 1.017	1 bit	C W
3	*Switch*	Central: Switch	DPT 1.001	1 bit	C W
8	*Scene 1 … 64*	Central: Scene	DPT 18.001	1 byte	C W
15 … 17	*Safety priority x*	Safety: Switch	DPT 1.005	1 bit	C W T A
23	*Connection A*	Logic/Threshold 1: Logic	DPT 1.021	1 bit	C W
23	*Threshold input*	Logic/Threshold 1: Threshold	DPT 5.001	1 byte	C W
23	*Threshold input*	Logic/Threshold 1: Threshold	DPT 5.010	1 byte	C W
23	*Threshold input*	Logic/Threshold 1: Threshold	DPT 7.001	2 bytes	C W
23	*Threshold input*	Logic/Threshold 1: Threshold	DPT 9.001	2 bytes	C W
23	*Threshold input*	Logic/Threshold 1: Threshold	DPT 9.004	2 bytes	C W
24	*Change upper threshold*	Logic/Threshold 1: Threshold	DPT 5.001	1 byte	C W
24	*Change upper threshold*	Logic/Threshold 1: Threshold	DPT 5.010	1 byte	C W
24	*Change upper threshold*	Logic/Threshold 1: Threshold	DPT 7.001	2 bytes	C W
24	*Change upper threshold*	Logic/Threshold 1: Threshold	DPT 9.001	2 bytes	C W
24	*Change upper threshold*	Logic/Threshold 1: Threshold	DPT 9.004	2 bytes	C W
24	*Connection B*	Logic/Threshold 1: Logic	DPT 1.021	1 bit	C W
25	*Change lower threshold*	Logic/Threshold 1: Threshold	DPT 5.001	1 byte	C W
25	*Change lower threshold*	Logic/Threshold 1: Threshold	DPT 5.010	1 byte	C W
25	*Change lower threshold*	Logic/Threshold 1: Threshold	DPT 7.001	2 bytes	C W
25	*Change lower threshold*	Logic/Threshold 1: Threshold	DPT 9.001	2 bytes	C W
25	*Change lower threshold*	Logic/Threshold 1: Threshold	DPT 9.004	2 bytes	C W
26	*Result*	Logic/Threshold 1: Logic	DPT 1.011	1 bit	C R T
26	*Result*	Logic/Threshold 1: Threshold	DPT 1.011	1 bit	C W
27 … 30		Logic/Threshold 2			
31 … 34		Logic/Threshold 3			
35 … 38		Logic/Threshold 4			
39 … 42		Logic/Threshold 5			
43 … 46		Logic/Threshold 6			
47 … 50		Logic/Threshold 7			
51 … 54		Logic/Threshold 8			
55 … 58		Logic/Threshold 9			
59 … 62		Logic/Threshold 10			
63 … 66		Logic/Threshold 11			
67 … 70		Logic/Threshold 12			
119	*Switch*	Channel A: Switch	DPT 1.001	1 bit	C W
120	*Status Switch*	Channel A: Switch	DPT 1.011	1 bit	C R T
121	*Disable*	Channel A: Switch	DPT 1.003	1 bit	C W
122	*Forced operation, 1-bit*	Channel A: Switch	DPT 1.003	1 bit	C W
122	*Forced operation, 2-bit*	Channel A: Switch	DPT 2.001	2 bit	C W
123	*Disable delay for switching ON and OFF*	Channel A: Switch	DPT 1.003	1 bit	C W
123	*Disable staircase lighting*	Channel A: Switch	DPT 1.003	1 bit	C W
124	*Staircase lighting permanent ON*	Channel A: Switch	DPT 1.001	1 bit	C W
125	*Staircase lighting time*	Channel A: Switch	DPT 7.005	2 bytes	C W
126	*Warning staircase lighting*	Channel A: Switch	DPT 1.001	1 bit	C R T
127	*Status information*	Channel A: Switch	nonDPT	1 byte	C R T
128	*Flashing*	Channel A: Switch	DPT 1.001	1 bit	C W
129	*Scene 1…64*	Channel A: Switch	DPT 18.001	1 byte	C W
130 … 133	*Retrieve scene assignment x*	Channel A: Switch	DPT 1.017	1 bit	C W
145 … 159		Channel B: Switch			
160 … 174		Channel C: Switch			
186 … 200		Channel D: Switch			
201 … 215		Channel E: Switch			
227 … 241		Channel F: Switch			
242 … 256		Channel G: Switch			
268 … 282		Channel H: Switch			
283 … 297		Channel I: Switch			
309 … 323		Channel J: Switch			
324 … 338		Channel K: Switch			
350 … 364		Channel L: Switch			

8.2 Group objects Central

No.	Function	Group Object Name	Data Point Type	Length	Flags
1	*In operation*	**Central: General**	**DPT 1.002**	**1 bit**	**C R T**
	In order to implement periodic monitoring of the device's presence on the ABB i-bus® KNX, an In operation telegram can be periodically sent on the ABB i-bus® KNX. The sent telegram value can be set in the parameter Enable group object "In operation". The cycle time can be set in the parameter Sending cycle. Condition for visibility: • Parameter window Device settings \ Parameter Enable group object "In operation" \ Option *Yes, send value 0 cyclically, Yes, send value 1 cyclically*				
2	*Request status values*	**Central: General**	**DPT 1.017**	**1 bit**	**C W**
	If a telegram with the value 0 or 1 is received on this group object, the values of all status group objects will be sent on the ABB i-bus® KNX. **Note** One of the following options must be selected for the sending behavior of the status values to be sent: • *On request* • *After change or on request* Condition for visibility: • Parameter window Device settings \ Parameter Enable group object "Request status values" \ Option *Yes*				
3	*Switch*	**Central: Switch**	**DPT 1.001**	**1 bit**	**C W**
	This group object can be used to switch several switching outputs of the device under central control. In the Parameter window Basic settings, in the Switch output reacts to central Switch group object parameter, it can be individually defined whether the output reacts to this group object . Depending on the output parameterization as an NC or NO contact, the switching command leads to a different switching reaction. NO contact telegram value: 1 = contact closed 0 = contact open NC contact telegram value: 1 = contact open 0 = contact closed **Note** With the *Logic/Threshold*, *Disable* and *Forced operations* functions or the safety priorities, changing this group object does not necessarily result in a changed contact position. Each relay can perform only a limited number of switching operations per minute. Frequent switching can cause a switching delay. More information → Technical data. Condition for visibility: • Parameter window Device settings \ Parameter Enable central Switch group object \ Option				
8	*Scene 1 … 64*	**Central: Scene**	**DPT 18.001**	**1 byte**	**C W**
	This group object can be used to send a scene telegram. The scene telegram includes the scene number and information about whether the scene is retrieved or the relay switching state is saved in the scene. The assignment to a scene number can be made in the Parameter window Scene assignments (Shutter Actuator) or Parameter window Scene assignment (Switch Actuator). All outputs assigned to this scene number perform the set reaction. Telegram value: 0 … 63 = retrieve scene x (x = 1 … 64) 128 … 191 = save scene x (x = 1 … 64) More information → Code table 8-bit scene, Page 162. **Note** With the priorities of the safety functions, a change in the value of this group object does not necessarily result in a changed contact position or blind/shutter position. Condition for visibility: • Parameter window Device settings \ Parameter Enable central Scene group object \ Option				

8.3 Group objects Safety

No.	Function	Group Object Name	Data Point Type	Length	Flags
15 … 17	*Safety priority x*	**Safety: Switch**	**DPT 1.005**	**1 bit**	**C W T A**

If the device receives a telegram with the value 1 on one of these group objects, the reaction set in the parameter Switching status for safety priority x will take place in the assigned Switch Actuator outputs.
An active safety priority overrides operation of the device.
Order of priority → Priorities for Switch Actuator, Page 96.
If the device does not receive a telegram on one of these group objects within the interval set in the parameter Cyclical monitoring interval (0 = cycl. monitoring deactivated), a fault will be assumed and the set reaction will take place. The first telegram after correction of the problem determines whether the reaction during the problem is retained:
- Value 1 = set reaction is retained
- Value 0 = set reaction is canceled

The monitoring period is restarted after a telegram is received, after the device is programed and on bus voltage recovery.
Telegram value:
1 = alarm (normal operation disabled)
0 = no alarm

Condition for visibility:
- Parameter window Safety/Weather alarms \ Parameter Enable group object "Safety priority x" \ Option *Yes*

8.4 Group objects Logic/Threshold 1

No.	Function	Group Object Name	Data Point Type	Length	Flags
23	*Connection A*	**Logic/Threshold 1: Logic**	**DPT 1.021**	**1 bit**	**C W**

This group object is used as one of two inputs for the function *Logic*.
More information → Function Logic, Page 88.
The logical connection is defined in Parameter window Logic/Threshold 1.

Condition for visibility:
- Parameter window Configuration \ Parameter Enable Logic/Threshold X-Y \ Option *Yes*
- Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *AND*, *OR*, *Exclusive OR*, *GATE*

No.	Function	Group Object Name	Data Point Type	Length	Flags
23	*Threshold input*	**Logic/Threshold 1: Threshold**	**DPT 5.001**	**1 byte**	**C W**

This group object is used as the input for the function *Threshold*.
More information → Function Threshold, Page 88.
The function *Threshold* is defined in Parameter window Logic/Threshold 1. The data point type for the group object depends on the option selected in the parameter Data type of group object "Threshold input".

Condition for visibility:
- Parameter window Configuration \ Parameter Enable Logic/Threshold X-Y \ Option *Yes*
- Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold*
- Parameter Data type of group object "Threshold input" \ Option *Percent (DPT5.001)*

No.	Function	Group Object Name	Data Point Type	Length	Flags
23	*Threshold input*	**Logic/Threshold 1: Threshold**	**DPT 5.010**	**1 byte**	**C W**

This group object is used as the input for the function *Threshold*.
More information → Function Threshold, Page 88.
The function *Threshold* is defined in Parameter window Logic/Threshold 1. The data point type for the group object depends on the option selected in the parameter Data type of group object "Threshold input".

Condition for visibility:
- Parameter window Configuration \ Parameter Enable Logic/Threshold X-Y \ Option *Yes*
- Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold*
- Parameter Data type of group object "Threshold input" \ Option *Meter pulses (DPT5.010)*

No.	Function	Group Object Name	Data Point Type	Length	Flags
23	*Threshold input*	**Logic/Threshold 1: Threshold**	**DPT 7.001**	**2 bytes**	**C W**

This group object is used as the input for the function *Threshold*.
More information → Function Threshold, Page 88.
The function *Threshold* is defined in Parameter window Logic/Threshold 1. The data point type for the group object depends on the option selected in the parameter Data type of group object "Threshold input".

Condition for visibility:
- Parameter window Configuration \ Parameter Enable Logic/Threshold X-Y \ Option *Yes*
- Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold*
- Parameter Data type of group object "Threshold input" \ Option *Meter pulses (DPT7.001)*

No.	Function	Group Object Name	Data Point Type	Length	Flags
23	*Threshold input*	**Logic/Threshold 1: Threshold**	**DPT 9.001**	**2 bytes**	**C W**

This group object is used as the input for the function *Threshold*.
More information → Function Threshold, Page 88.
The function *Threshold* is defined in Parameter window Logic/Threshold 1. The data point type for the group object depends on the option selected in the parameter Data type of group object "Threshold input".

Condition for visibility:
- Parameter window Configuration \ Parameter Enable Logic/Threshold X-Y \ Option *Yes*
- Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold*
- Parameter Data type of group object "Threshold input" \ Option *Temperature (DPT9.001)*

No.	Function	Group Object Name	Data Point Type	Length	Flags	
23	*Threshold input*	**Logic/Threshold 1: Threshold**	**DPT 9.004**	**2 bytes**	**C**	**W**
	This group object is used as the input for the function *Threshold*. More information → Function Threshold, Page 88. The function *Threshold* is defined in Parameter window Logic/Threshold 1. The data point type for the group object depends on the option selected in the parameter Data type of group object "Threshold input". Condition for visibility: • Parameter window Configuration \ Parameter Enable Logic/Threshold X-Y \ Option *Yes* • Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold* • Parameter Data type of group object "Threshold input" \ Option *Lux (DPT9.004)*					
24	*Connection B*	**Logic/Threshold 1: Logic**	**DPT 1.021**	**1 bit**	**C**	**W**
	This group object is used as one of two inputs for the function *Logic*. More information → Function Logic, Page 88. The logical connection is defined in Parameter window Logic/Threshold 1. Condition for visibility: • Parameter window Configuration \ Parameter Enable Logic/Threshold X-Y \ Option *Yes* • Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *AND, OR, Exclusive OR, GATE*					
24	*Change upper threshold*	**Logic/Threshold 1: Threshold**	**DPT 5.001**	**1 byte**	**C**	**W**
	This group object can be used to change the upper threshold. The data point type for the group object depends on the option selected in the parameter Data type of group object "Threshold input". Condition for visibility: • Parameter window Configuration \ Parameter Enable Logic/Threshold X-Y \ Option *Yes* • Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold* • Parameter Data type of group object "Threshold input" \ Option *Percent (DPT5.001)* • Parameter Change thresholds via KNX \ Option *Yes*					
24	*Change upper threshold*	**Logic/Threshold 1: Threshold**	**DPT 5.010**	**1 byte**	**C**	**W**
	This group object can be used to change the upper threshold. The data point type for the group object depends on the option selected in the parameter Data type of group object "Threshold input". Condition for visibility: • Parameter window Configuration \ Parameter Enable Logic/Threshold X-Y \ Option *Yes* • Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold* • Parameter Data type of group object "Threshold input" \ Option *Meter pulses (DPT5.010)* • Parameter Change thresholds via KNX \ Option *Yes*					
24	*Change upper threshold*	**Logic/Threshold 1: Threshold**	**DPT 7.001**	**2 bytes**	**C**	**W**
	This group object can be used to change the upper threshold. The data point type for the group object depends on the option selected in the parameter Data type of group object "Threshold input". Condition for visibility: • Parameter window Configuration \ Parameter Enable Logic/Threshold X-Y \ Option *Yes* • Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold* • Parameter Data type of group object "Threshold input" \ Option *Meter pulses (DPT7.001)* • Parameter Change thresholds via KNX \ Option *Yes*					
24	*Change upper threshold*	**Logic/Threshold 1: Threshold**	**DPT 9.001**	**2 bytes**	**C**	**W**
	This group object can be used to change the upper threshold. The data point type for the group object depends on the option selected in the parameter Data type of group object "Threshold input". Condition for visibility: • Parameter window Configuration \ Parameter Enable Logic/Threshold X-Y \ Option *Yes* • Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold* • Parameter Data type of group object "Threshold input" \ Option *Temperature (DPT9.001)* • Parameter Change thresholds via KNX \ Option *Yes*					
24	*Change upper threshold*	**Logic/Threshold 1: Threshold**	**DPT 9.004**	**2 bytes**	**C**	**W**
	This group object can be used to change the upper threshold. The data point type for the group object depends on the option selected in the parameter Data type of group object "Threshold input". Condition for visibility: • Parameter window Configuration \ Parameter Enable Logic/Threshold X-Y \ Option *Yes* • Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold* • Parameter Data type of group object "Threshold input" \ Option *Lux (DPT9.004)* • Parameter Change thresholds via KNX \ Option *Yes*					
25	*Change lower threshold*	**Logic/Threshold 1: Threshold**	**DPT 5.001**	**1 byte**	**C**	**W**
	This group object can be used to change the lower threshold. The data point type for the group object depends on the option selected in the parameter Data type of group object "Threshold input". Condition for visibility: • Parameter window Configuration \ Parameter Enable Logic/Threshold X-Y \ Option *Yes* • Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold* • Parameter Data type of group object "Threshold input" \ Option *Percent (DPT5.001)* • Parameter Change thresholds via KNX \ Option *Yes*					

No.	Function	Group Object Name	Data Point Type	Length	Flags
25	*Change lower threshold*	**Logic/Threshold 1: Threshold**	**DPT 5.010**	**1 byte**	**C W**
	This group object can be used to change the lower threshold. The data point type for the group object depends on the option selected in the parameter Data type of group object "Threshold input". Condition for visibility: • Parameter window Configuration \ Parameter Enable Logic/Threshold X-Y \ Option *Yes* • Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold* • Parameter Data type of group object "Threshold input" \ Option *Meter pulses (DPT5.010)* • Parameter Change thresholds via KNX \ Option *Yes*				
25	*Change lower threshold*	**Logic/Threshold 1: Threshold**	**DPT 7.001**	**2 bytes**	**C W**
	This group object can be used to change the lower threshold. The data point type for the group object depends on the option selected in the parameter Data type of group object "Threshold input". Condition for visibility: • Parameter window Configuration \ Parameter Enable Logic/Threshold X-Y \ Option *Yes* • Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold* • Parameter Data type of group object "Threshold input" \ Option *Meter pulses (DPT7.001)* • Parameter Change thresholds via KNX \ Option *Yes*				
25	*Change lower threshold*	**Logic/Threshold 1: Threshold**	**DPT 9.001**	**2 bytes**	**C W**
	This group object can be used to change the lower threshold. The data point type for the group object depends on the option selected in the parameter Data type of group object "Threshold input". Condition for visibility: • Parameter window Configuration \ Parameter Enable Logic/Threshold X-Y \ Option *Yes* • Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold* • Parameter Data type of group object "Threshold input" \ Option *Temperature (DPT9.001)* • Parameter Change thresholds via KNX \ Option *Yes*				
25	*Change lower threshold*	**Logic/Threshold 1: Threshold**	**DPT 9.004**	**2 bytes**	**C W**
	This group object can be used to change the lower threshold. The data point type for the group object depends on the option selected in the parameter Data type of group object "Threshold input". Condition for visibility: • Parameter window Configuration \ Parameter Enable Logic/Threshold X-Y \ Option *Yes* • Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold* • Parameter Data type of group object "Threshold input" \ Option *Lux (DPT9.004)* • Parameter Change thresholds via KNX \ Option *Yes*				
26	*Result*	**Logic/Threshold 1: Logic**	**DPT 1.011**	**1 bit**	**C R T**
	This group object can be used to send the result of the function *Logic* on the ABB i-bus® KNX. More information → Function Logic, Page 88. **Note** The result of the function *Logic* can also be internally connected to an output. Condition for visibility: • Parameter window Configuration \ Parameter Enable Logic/Threshold X-Y \ Option *Yes* • Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *AND*, *OR*, *Exclusive OR*, *GATE* • Parameter Send result on KNX \ Option *Yes*				
26	*Result*	**Logic/Threshold 1: Threshold**	**DPT 1.011**	**1 bit**	**C W**
	This group object can be used to send the result of the function *Threshold* on the ABB i-bus® KNX. More information → Function Threshold, Page 88. **Note** The result of the function *Threshold* can also be internally connected to an output. Condition for visibility: • Parameter window Configuration \ Parameter Enable Logic/Threshold X-Y \ Option *Yes* • Parameter window Logic/Threshold 1 \ Parameter Function of the logic gate \ Option *Threshold* • Parameter Send result on KNX \ Option *Yes*				

8.5 Group objects Logic/Threshold 2

No.	Function	Group Object Name	Data Point Type	Length	Flags
27 … 30		**Logic/Threshold 2**			
	→ Group objects Logic/Threshold 1, Page 147				

8.6 Group objects Logic/Threshold 3

No.	Function	Group Object Name	Data Point Type	Length	Flags
31 … 34		**Logic/Threshold 3**			
	→ Group objects Logic/Threshold 1, Page 147				

8.7 Group objects Logic/Threshold 4

No.	Function	Group Object Name	Data Point Type	Length	Flags
35 ... 38		**Logic/Threshold 4**			
	→ Group objects Logic/Threshold 1, Page 147				

8.8 Group objects Logic/Threshold 5

No.	Function	Group Object Name	Data Point Type	Length	Flags
39 ... 42		**Logic/Threshold 5**			
	→ Group objects Logic/Threshold 1, Page 147				

8.9 Group objects Logic/Threshold 6

No.	Function	Group Object Name	Data Point Type	Length	Flags
43 ... 46		**Logic/Threshold 6**			
	→ Group objects Logic/Threshold 1, Page 147				

8.10 Group objects Logic/Threshold 7

No.	Function	Group Object Name	Data Point Type	Length	Flags
47 ... 50		**Logic/Threshold 7**			
	→ Group objects Logic/Threshold 1, Page 147				

8.11 Group objects Logic/Threshold 8

No.	Function	Group Object Name	Data Point Type	Length	Flags
51 ... 54		**Logic/Threshold 8**			
	→ Group objects Logic/Threshold 1, Page 147				

8.12 Group objects Logic/Threshold 9

No.	Function	Group Object Name	Data Point Type	Length	Flags
55 ... 58		**Logic/Threshold 9**			
	→ Group objects Logic/Threshold 1, Page 147				

8.13 Group objects Logic/Threshold 10

No.	Function	Group Object Name	Data Point Type	Length	Flags
59 ... 62		**Logic/Threshold 10**			
	→ Group objects Logic/Threshold 1, Page 147				

8.14 Group objects Logic/Threshold 11

No.	Function	Group Object Name	Data Point Type	Length	Flags
63 ... 66		**Logic/Threshold 11**			
	→ Group objects Logic/Threshold 1, Page 147				

8.15 Group objects Logic/Threshold 12

No.	Function	Group Object Name	Data Point Type	Length	Flags
67 ... 70		**Logic/Threshold 12**			
	→ Group objects Logic/Threshold 1, Page 147				

8.16 Group objects Channel A: Switch

No.	Function	Group Object Name	Data Point Type	Length	Flags
119	*Switch*	**Channel A: Switch**	**DPT 1.001**	**1 bit**	**C W**

This group object can be used to switch the output On and Off.
NO contact telegram value:
1 = On
0 = Off
NC contact telegram value:
1 = Off
0 = On

Note
With the *Logic/Threshold*, *Disable* and *Forced operation* functions or the *safety priority*, changing this group object does not necessarily result in a changed contact position.
Each relay can perform only a limited number of switching operations per minute. Frequent switching can cause a switching delay. More information → Technical data.

Condition for visibility:
- Parameter window Configuration \ Parameter Enable output X \ Option *Yes*
- Parameter window Switch Actuator A \ Parameter window Functions \ Parameter Application \ Option Switch Actuator

No.	Function	Group Object Name	Data Point Type	Length	Flags
120	*Status Switch*	**Channel A: Switch**	**DPT 1.011**	**1 bit**	**C R T**

This group object can be used to indicate the relay contact position. The telegram value is defined in the parameter Value of group object "Status switch".
Telegram value:
1 = contact closed or open, depending on parameterization
0 = contact open or closed, depending on parameterization

Condition for visibility:
- Parameter window Configuration \ Parameter Enable output X \ Option *Yes*
- Parameter window Switch Actuator A \ Parameter window Functions \ Parameter Application \ Option Switch Actuator
- Parameter window Switch Actuator A \ Parameter window Basic settings \ Parameter Parameter setting \ Option *Individual* \ Parameter Feedback of switching state via group object "Status switch" \ Option *Yes*

No.	Function	Group Object Name	Data Point Type	Length	Flags
121	*Disable*	**Channel A: Switch**	**DPT 1.003**	**1 bit**	**C W**

This group object can be used to disable the output. The function *Disable* overrides the active signals of the output. The relay contact position can be defined in the parameter Disable.
Telegram value:
1 = disable
0 = enable

Note
Disabling can be influenced via the i-bus® Tool.

Condition for visibility:
- Parameter window Configuration \ Parameter Enable output X \ Option *Yes*
- Parameter window Switch Actuator A \ Parameter window Functions \ Parameter Application \ Option Switch Actuator \ Parameter Enable function Safety \ Option *Yes*
- Parameter window Switch Actuator A \ Parameter window Safety \ Parameter Parameter setting \ Option *Individual* \ Parameter Disable \ Option *ON* \ *OFF* \ *Unchanged (disable)*

No.	Function	Group Object Name	Data Point Type	Length	Flags	
122	*Forced operation, 1-bit*	**Channel A: Switch**	**DPT 1.003**	**1 bit**	**C**	**W**

This group object can be used to activate 1-bit forced operation. The telegram value used to activate/deactivate forced operation can be defined in the parameter Forced operation (1 bit / 2 bit).
When forced operation is activated, the relay switching contact will assume the state defined in the parameter Switching status during forced operation. The output cannot be controlled via KNX commands while forced operation is active. When forced operation is deactivated, the relay switching contact will assume the state defined in the Switching state on cancellation of disabling, forced operation and safety priority parameter and operation will be enabled.
Telegram value:
1 = forced operation active, state On/Off/Unchanged
0 = forced operation inactive

Note
Forced operation can be influenced via the i-bus® Tool.

Condition for visibility:
- Parameter window Configuration \ Parameter Enable output X \ Option *Yes*
- Parameter window Switch Actuator A \ Parameter window Functions \ Parameter Application \ Option Switch Actuator \ Parameter Enable function Safety \ Option *Yes*
- Parameter window Switch Actuator A \ Parameter window Safety \ Parameter Parameter setting \ Option *Individual* \ Parameter Forced operation (1 bit / 2 bit) \ Option *Activated 1 bit – 0 active* \ Option *Activated 1 bit – 1 active*

No.	Function	Group Object Name	Data Point Type	Length	Flags	
122	*Forced operation, 2-bit*	**Channel A: Switch**	**DPT 2.001**	**2 bit**	**C**	**W**

This group object can be used to activate 2-bit forced operation.
With 2-bit forced operation, the value of the group object determines the switching state. The first bit activates forced operation. The second bit switches between the two states.
The output cannot be controlled via KNX commands while forced operation is active. When forced operation is deactivated, the relay switching contact will assume the state defined in the Switching state on cancellation of disabling, forced operation and safety priority parameter and operation will be enabled.
Telegram value (bit 1 | bit 0):
0 | 0 = forced operation inactive
0 | 1 = forced operation inactive
1 | 0 = forced operation active, state Off
1 | 1= forced operation active, state On

Note
Forced operation can be influenced via the i-bus® Tool.

Condition for visibility:
- Parameter window Configuration \ Parameter Enable output X \ Option *Yes*
- Parameter window Switch Actuator A \ Parameter window Functions \ Parameter Application \ Option Switch Actuator \ Parameter Enable function Safety \ Option *Yes*
- Parameter window Switch Actuator A \ Parameter window Safety \ Parameter Parameter setting \ Option *Individual* \ Parameter Forced operation (1 bit / 2 bit) \ Option *Activated 2 bit*

No.	Function	Group Object Name	Data Point Type	Length	Flags	
123	*Disable staircase lighting*	**Channel A: Switch**	**DPT 1.003**	**1 bit**	**C**	**W**

This group object can be used to disable the function *Staircase lighting*. If the function *Staircase lighting* is disabled, the switch-on command is forwarded without time function in the function chain and the output reacts according to its parameterization.
Telegram value:
1 = function Staircase lighting disabled
0 = function Staircase lighting enabled

Condition for visibility:
- Parameter window Configuration \ Parameter Enable output X \ Option *Yes*
- Parameter window Switch Actuator A \ Parameter window Functions \ Parameter Application \ Option Switch Actuator \ Parameter Enable function Time \ Option *Staircase lighting*
- Parameter window Switch Actuator A \ Parameter window Staircase lighting \ Parameter Parameter setting \ Option *Individual* \ Parameter Disable staircase lighting via group object \ Option *Yes*

No.	Function	Group Object Name	Data Point Type	Length	Flags	
123	*Disable delay for switching ON and OFF*	**Channel A: Switch**	**DPT 1.003**	**1 bit**	**C**	**W**

This group object can be used to disable the function *Delay for switching ON and OFF*. If the function *Delay for switching ON and OFF* is disabled, the switch-on command is forwarded without time function in the function chain and the output reacts according to its parameterization.
Telegram value:
1 = delay for switching ON and OFF disabled
0 = delay for switching ON and OFF enabled

Note
If a delay time was set for a scene assignment in the parameter Delay, this group object can also be used to disable the delay of the scene.

Condition for visibility:
- Parameter window Configuration \ Parameter Enable output X \ Option *Yes*
- Parameter window Switch Actuator A \ Parameter window Functions \ Parameter Application \ Option Switch Actuator \ Parameter Enable function Time \ Option *Delay for switching ON and OFF*
- Parameter window Switch Actuator A \ Parameter window Delay for switching ON and OFF \ Parameter Parameter setting \ Option *Individual* \ Parameter Disable delay for switching ON and OFF via group object \ Option *Yes*

No.	Function	Group Object Name	Data Point Type	Length	Flags
124	*Staircase lighting permanent ON*	**Channel A: Switch**	**DPT 1.001**	**1 bit**	**C W**

This group object can be used to switch on the output permanently when the function *Staircase lighting* is active. Other functions continue to run in the background, but they do not trigger any switching operation.
Telegram value:
1 = starts Permanent ON operation
0 = ends Permanent ON operation

Condition for visibility:
- Parameter window Configuration \ Parameter Enable output X \ Option *Yes*
- Parameter window Switch Actuator A \ Parameter window Functions \ Parameter Application \ Option Switch Actuator \ Parameter Enable function Time \ Option *Staircase lighting*

No.	Function	Group Object Name	Data Point Type	Length	Flags
125	*Staircase lighting time*	**Channel A: Switch**	**DPT 7.005**	**2 bytes**	**C W**

This group object can be used to set the Staircase lighting time.
Telegram value:
0 … 65,535 s

Condition for visibility:
- Parameter window Configuration \ Parameter Enable output X \ Option *Yes*
- Parameter window Switch Actuator A \ Parameter window Functions \ Parameter Application \ Option Switch Actuator \ Parameter Enable function Time \ Option *Staircase lighting*
- Parameter window Switch Actuator A \ Parameter window Staircase lighting \ Parameter Parameter setting \ Option *Individual* \ Parameter Change staircase lighting time via group object \ Option *Yes*

No.	Function	Group Object Name	Data Point Type	Length	Flags
126	*Warning staircase lighting*	**Channel A: Switch**	**DPT 1.001**	**1 bit**	**C R T**

This group object can be used to indicate the end of the Staircase lighting time. The group object is set to the value 1 at the beginning of the Warning time. The group object is set to the value 0 when the Warning time elapses. The group object can be used to switch a warning light.
Telegram value:
1 = warning time running
0 = warning time not running

Condition for visibility:
- Parameter window Configuration \ Parameter Enable output X \ Option *Yes*
- Parameter window Switch Actuator A \ Parameter window Functions \ Parameter Application \ Option Switch Actuator \ Parameter Enable function Time \ Option *Staircase lighting*
- Parameter window Switch Actuator A \ Parameter window Staircase lighting \ Parameter Parameter setting \ Option *Individual* \ Parameter Warning before switching off the staircase lighting \ Option *Via group object* \ *Via object and quick switching ON/OFF*

No.	Function	Group Object Name	Data Point Type	Length	Flags
127	*Status information*	**Channel A: Switch**	**nonDPT**	**1 byte**	**C R T**

This group object can be used to output status information about the output's operating state.
The sending behavior can be defined in the Send value of group object parameter. If the "On request" or "After change or on request" option is selected, the status is sent each time a bit value is changed.
Bit 0: Manual operation
Telegram value:
1 = active
0 = inactive
Bit 1: Disable
Telegram value:
1 = active
0 = inactive
Bit 2: Forced operation
Telegram value:
1 = active
0 = inactive
Bit 3: Safety priority 1
Telegram value:
1 = active
0 = inactive
Bit 4: Safety priority 2
Telegram value:
1 = active
0 = inactive
Bit 5: Safety priority 3
Telegram value:
1 = active
0 = inactive
Bit 6: Staircase lighting Permanent ON
Telegram value:
1 = active
0 = inactive
Bit 7: i-bus® Tool
Telegram value:
1 = active
0 = inactive
For more information Code table for 8-bit status byte (Switch).

Condition for visibility:
- Parameter window Configuration \ Parameter Enable output X \ Option *Yes*
- Parameter window Switch Actuator A \ Parameter window Functions \ Parameter Application \ Option Switch Actuator
- Parameter window Switch Actuator A \ Parameter window Basic settings \ Parameter Parameter setting \ Option *Individual* \ Parameter Enable group object "Status information" \ Option *Yes*

No.	Function	Group Object Name	Data Point Type	Length	Flags
128	*Flashing*	**Channel A: Switch**	**DPT 1.001**	**1 bit**	**C W**

This group object can be used to activate the function *Flashing*. The telegram value that activates the function *Flashing* can be defined in the parameter Flashing if group object Flashing equals.
For more information → Function Flashing, Page 93.

Note
Only a limited number of switching operations can be performed per minute and relay. Frequent switching can cause a switching delay. Refer to the Technical data for more information.

Condition for visibility:
- Parameter window Configuration \ Parameter Enable output X \ Option *Yes*
- Parameter window Switch Actuator A \ Parameter window Functions \ Parameter Application \ Option Switch Actuator \ Parameter Enable function Time \ Option *Flashing*

No.	Function	Group Object Name	Data Point Type	Length	Flags
129	*Scene 1…64*	**Channel A: Switch**	**DPT 18.001**	**1 byte**	**C W**

This group object can be used to send a scene telegram. The scene telegram includes the scene number and information about whether the scene is retrieved or the relay switching state is saved in the scene.
Assignment to a scene number can be performed in the Parameter window Scene assignment, and this applies only to the output in which the scene assignment was set.
Telegram value:
0 … 63 = retrieve scene x (x = 1 … 64)
128 … 191 = save scene x (x = 1 … 64)
More information → Code table 8-bit scene, Page 162.

Note
With the priorities of the safety functions, a change in the group object does not necessarily result in a changed contact position.

Condition for visibility:
- Parameter window Configuration \ Parameter Enable output X \ Option *Yes*
- Parameter window Switch Actuator A \ Parameter window Functions \ Parameter Application \ Option Switch Actuator \ Parameter Enable function Scenes \ Option *Yes*

No.	Function	Group Object Name	Data Point Type	Length	Flags
130 … 133	*Retrieve scene assignment x*	**Channel A: Switch**	**DPT 1.017**	**1 bit**	**C W**

This group object can be used to retrieve a scene assignment.
Telegram value:
1 = retrieve scene assignment x (x = 1 … 4)
0 = retrieve scene assignment x (x = 1 … 4)

Note
With safety priorities, disabling or forced operation, receipt of the group object Retrieve scene assignment x does not necessarily change the contact position.

Condition for visibility:
- Parameter window Configuration \ Parameter Enable output X \ Option *Yes*
- Parameter window Switch Actuator A \ Parameter window Functions \ Parameter Application \ Option Switch Actuator \ Parameter Enable function Scenes \ Option *Yes*
- Parameter window Switch Actuator A \ Parameter window Scene assignment \ Parameter Parameter setting \ Option *Individual* \ Parameter Enable scene assignment x \ Option *Yes* \ Parameter Scene retrieval additionally via group object \ Option Yes

8.17 Group objects Channel B: Switch

No.	Function	Group Object Name	Data Point Type	Length	Flags
145 … 159		**Channel B: Switch**			
	→ Group objects Channel A: Switch, Page 151				

8.18 Group objects Channel C: Switch

No.	Function	Group Object Name	Data Point Type	Length	Flags
160 … 174		**Channel C: Switch**			
	→ Group objects Channel A: Switch, Page 151				

8.19 Group objects Channel D: Switch

No.	Function	Group Object Name	Data Point Type	Length	Flags
186 … 200		**Channel D: Switch**			
	→ Group objects Channel A: Switch, Page 151				

8.20 Group objects Channel E: Switch

No.	Function	Group Object Name	Data Point Type	Length	Flags
201 ... 215		**Channel E: Switch**			
	→ Group objects Channel A: Switch, Page 151				

8.21 Group objects Channel F: Switch

No.	Function	Group Object Name	Data Point Type	Length	Flags
227 ... 241		**Channel F: Switch**			
	→ Group objects Channel A: Switch, Page 151				

8.22 Group objects Channel G: Switch

No.	Function	Group Object Name	Data Point Type	Length	Flags
242 ... 256		**Channel G: Switch**			
	→ Group objects Channel A: Switch, Page 151				

8.23 Group objects Channel H: Switch

No.	Function	Group Object Name	Data Point Type	Length	Flags
268 ... 282		**Channel H: Switch**			
	→ Group objects Channel A: Switch, Page 151				

8.24 Group objects Channel I: Switch

No.	Function	Group Object Name	Data Point Type	Length	Flags
283 ... 297		**Channel I: Switch**			
	→ Group objects Channel A: Switch, Page 151				

8.25 Group objects Channel J: Switch

No.	Function	Group Object Name	Data Point Type	Length	Flags
309 ... 323		**Channel J: Switch**			
	→ Group objects Channel A: Switch, Page 151				

8.26 Group objects Channel K: Switch

No.	Function	Group Object Name	Data Point Type	Length	Flags
324 ... 338		**Channel K: Switch**			
	→ Group objects Channel A: Switch, Page 151				

8.27 Group objects Channel L: Switch

No.	Function	Group Object Name	Data Point Type	Length	Flags
350 ... 364		**Channel L: Switch**			
	→ Group objects Channel A: Switch, Page 151				

9 Operation

9.1 Manual operation

The contacts can be switched on (I) and off (0) manually using the toggle switches even:

- if an output is disabled by a safety function
- in case of bus voltage failure

10 Maintenance and cleaning

10.1 Maintenance

The device is maintenance-free if used properly. In the event of damage, e.g. during transport and/or storage, repairs are not allowed to be made.

10.2 Cleaning

NOTICE
Aggressive cleaning agents can damage the device's surface.
Sprayed cleaning agents can penetrate into the device through gaps.

1. Disconnect the device from the electrical power supply before cleaning.
2. Clean dirty devices using a dry cloth or a cloth dampened with a soapy solution.

11 Removal and disposal

11.1 Removal

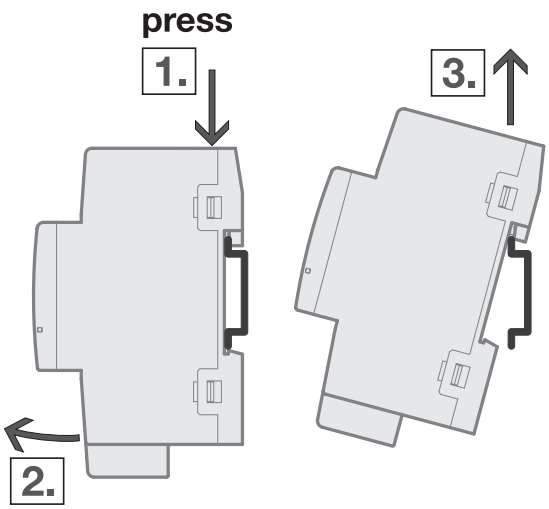


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Fig. 52: Removal from the DIN rail

1. Press on the top of the device.
2. Release the bottom of the device from the DIN rail.
3. Lift the device up and off the DIN rail.

11.2 Environment

Consider environmental protection.

Electrical and electronic devices must not be disposed of as domestic waste.

The device contains valuable resources that can be recycled. Therefore, please take the device to a suitable recycling center. All packaging materials and devices are provided with markings and test seals for proper disposal. Always dispose of packaging material and electrical devices or their components at collection points or disposal companies authorized for this purpose. The products comply with the statutory requirements, particularly the law on electrical and electronic equipment and the REACH regulation. (EU directive 2012/19/EU WEEE and 2011/65/EU RoHS) (EU REACH regulation and the law implementing the regulation (EC) no.1907/2006)

12 Planning and application

12.1 Introduction

This chapter includes some tips and application examples for practical use of the device.

12.2 Ballast calculation

The ballast unit is used to operate gas-discharge lamps, e.g. fluorescent lamps. It converts the main voltage to the optimal operating voltage for the gas-discharge lamp and allows the gas-discharge lamps to be ignited (switched on). Lamps ignite with a time offset in choke/starter circuits; all fluorescent lamps ignite nearly simultaneously in ballast circuits.

With LED lamps, the ballast unit is referred to as an LED driver or LED converter. The LED driver provides constant direct current or smoothed direct current for operating the connected lamps (LEDs).

Input capacitors in the electronic circuit of the ballast unit are required for storing charge to rectify and stabilize the alternating voltage or current on the primary side. The input capacitors charge at the moment of switch-on, briefly resulting in a very high inrush current. If several ballast units are used in the same circuit, simultaneous charging of the capacitors can cause very high inrush currents to flow. This peak inrush current I_p must be taken into account when designing the switching contacts and selecting the back-up fuse.

The ballast unit's inrush current depends not only on the wattage, but also on the type, the number of elements (lamps) and the manufacturer. The specified maximum number of ballast units that can be connected per output is therefore only a guide value.

To determine the maximum number of ballast units that can be connected per output, the peak inrush current I_p and the associated pulse width of the ballast unit must be known. Refer to the technical data of the ballast unit for this information.

Typical peak inrush current I_p values for
- single-element ballast units with T5/T8 fluorescent lamps: 15 … 50 A, pulse time 120 … 200 µs
- LED drivers: 3 … 50 A, pulse time 40 … 250 µs

Refer to the device's technical data → Product overview, Page 9 for the maximum peak inrush current I_p of the switching outputs.

Example:
Sample calculation for determining the maximum number of connectible ballast units per output:
- ABB i-bus® KNX ballast 1 x 58 CF, maximum peak inrush current I_p = 33.9 A (147.1 µs)
- Maximum permissible peak inrush current I_p of the output: 200 A

200 A / 33.9 A = 5.89
Max. five ballast units can be connected.

12.3 AC1-, AC3, AX-, C load specifications

In Intelligent Building Control, different switching capabilities and performance specifications required by special applications have become established in industrial and residential systems. These performance specifications are rooted in the respective national and international standards. The tests are defined to simulate typical applications, e.g. motor loads (industrial) or fluorescent lamps (residential).

Specifications AC1 and AC3 are switching performance specifications which have become established in the industrial field.

Typical application:

AC1– Non-inductive or slightly inductive load, resistance furnaces

(refers to the switching of resistive loads, cos _ = 0.8)

AC3 – Squirrel-cage motors: starting, switching off during operation

(refers to an (inductive) motor load, cos _ = 0.45)

AC5a – Switching of electric discharge lamps

These switching performances are defined in standard EN 60 947-4-1, Contactors and motor-starters – Electromechanical contactors and motor-starters.

The standard describes starters and/or contactors that were originally used primarily in industrial applications.

The AX designation has come into use in the field of building control.

AX refers to a (capacitive) fluorescent lighting load.

The term "switchable capacitive loads" (200 µF, 140 µF, 70 µF or 35 µF) is used in connection with fluorescent lighting loads.

This switching performance refers to the standard EN 60669, Switches for household and similar fixed electrical installations - Part 1: General requirements, which is used primarily in building control applications. Testing with 70 µF is required for 6 A devices and testing with 140 µF for devices rated higher than 6 A.

The switching capacity specifications AC and AX are not directly comparable with each other. The following switching capacity quality can nevertheless be determined:

The lowest switching capacity corresponds to the specification

AC1 – primarily resistive loads.

A higher switching capacity is

AX – fluorescent lighting loads, according to the standard: 70 µF (6 A), 140 µF (10 A, 16 A).

The highest switching capacity is identified by

AC3 – motor loads,

C load – fluorescent lighting loads (200 µF).

Both specifications are nearly equivalent. This means that a device that passed the test for AC3 according to DIN 60947 will very likely also pass the tests according to DIN EN 60669 with 200 µF.

In summary:

•Users or customers characterized by industrial applications are more likely to speak of AC3 switching capacity.

•By contrast, users in the field of building control or lighting technology are more likely to use the term "AX switching capacity" or "C load" (200 µF loads).

The switching capacity differences must be considered when selecting a Switch Actuator.

12.4 Telegram rate limitation

The bus load generated by the device can be limited using the telegram rate limit. This limit relates to all telegrams sent by the device.

The device counts the number of telegrams sent within the parameterized period. As soon as the maximum number of sent telegrams is reached, no further telegrams are sent on the ABB i-bus® KNX until the end of the period. A new period commences at the end of the previous period. The telegram counter is reset to zero, and sending of telegrams is allowed again. The current group object value at the time of sending is always sent.
The first period (break time) is not precisely predefined. It can be anywhere between zero seconds and the parameterized time. The subsequent sending times correspond to the parameterized time.
Example:
Maximum number of telegrams sent = 5, period = 5 s. 20 telegrams are ready to send. The device immediately sends five telegrams. The next five telegrams are sent after a maximum of 5 seconds. From this point, a further five telegrams are sent via ABB i-bus® KNX every 5 seconds.

13 Appendix

13.1 Code table 8-bit scene

The following table contains the telegram code of the 64 scenes. Each 8-bit scene is indicated in hexadecimal and binary codes. The 8-bit value is sent when a scene is retrieved/saved.

x = value 1, applicable
empty = value 0, not applicable
A = retrieve
S = save
- = no reaction

Bit no.		7	6	5	4	3	2	1	0		
8-bit value	Hexadecimal	Retrieve 0 Save 1	Not defined	Binary number codes	Binary number codes n	Binary number codes	Binary number codes	Binary number codes	Binary number codes	Scene number	Retrieve A Save S No reaction –
0	00									Via KNX	
0	00	0								1	A
1	01	0							x	2	A
2	02	0						x		3	A
3	03	0						x	x	4	A
4	04	0					x			5	A
5	05	0					x		x	6	A
6	06	0					x	x		7	A
7	07	0					x	x	x	8	A
8	08	0				x				9	A
9	09	0				x			x	10	A
10	0A	0				x		x		11	A
11	0B	0				x		x	x	12	A
12	0C	0				x	x			13	A
13	0D	0				x	x		x	14	A
14	0E	0				x	x	x		15	A
15	0F	0				x	x	x	x	16	A
16	10	0			x					17	A
17	11	0			x				x	18	A
18	12	0			x			x		19	A
19	13	0			x			x	x	20	A
20	14	0			x		x			21	A
21	15	0			x		x		x	22	A
22	16	0			x		x	x		23	A
23	17	0			x		x	x	x	24	A
24	18	0			x	x				25	A
25	19	0			x	x			x	26	A
26	1A	0			x	x		x		27	A
27	1B	0			x	x		x	x	28	A
28	1C	0			x	x	x			29	A
29	1D	0			x	x	x		x	30	A
30	1E	0			x	x	x	x		31	A
31	1F	0			x	x	x	x	x	32	A
32	20	0		x						33	A
33	21	0		x					x	34	A
34	22	0		x				x		35	A
35	23	0		x				x	x	36	A
36	24	0		x			x			37	A
37	25	0		x			x		x	38	A
38	26	0		x			x	x		39	A
39	27	0		x			x	x	x	40	A
40	28	0		x		x				41	A
41	29	0		x		x			x	42	A
42	2A	0		x		x		x		43	A
43	2B	0		x		x		x	x	44	A
44	2C	0		x		x	x			45	A

Bit no.		7	6	5	4	3	2	1	0		
8-bit value	Hexadecimal	Retrieve 0 Save 1	Not defined	Binary number codes	Binary number codes n	Binary number codes	Binary number codes	Binary number codes	Binary number codes	Scene number	Retrieve A Save S No reaction –
45	2D	0		x		x	x		x	46	A
46	2E	0		x		x	x	x		47	A
47	2F	0		x		x	x	x	x	48	A
48	30	0		x	x					49	A
49	31	0		x	x				x	50	A
50	32	0		x	x			x		51	A
51	33	0		x	x			x	x	52	A
52	34	0		x	x		x			53	A
53	35	0		x	x		x		x	54	A
54	36	0		x	x		x	x		55	A
55	37	0		x	x		x	x	x	56	A
56	38	0		x	x	x				57	A
57	39	0		x	x	x			x	58	A
58	3A	0		x	x	x		x		59	A
59	3B	0		x	x	x		x	x	60	A
60	3C	0		x	x	x	x			61	A
61	3D	0		x	x	x	x		x	62	A
62	3E	0		x	x	x	x	x		63	A
63	3F	0		x	x	x	x	x	x	64	A
64	40	–	x							–	–
65	41	–	x						x	–	–
66	42	–	x					x		–	–
67	43	–	x					x	x	–	–
68	44	–	x				x			–	–
69	45	–	x				x		x	–	–
70	46	–	x				x	x		–	–
71	47	–	x				x	x	x	–	–
72	48	–	x			x				–	–
73	49	–	x			x			x	–	–
74	4A	–	x			x		x		–	–
75	4B	–	x			x		x	x	–	–
76	4C	–	x			x	x			–	–
77	4D	–	x			x	x		x	–	–
78	4E	–	x			x	x	x		–	–
79	4F	–	x			x	x	x	x	–	–
80	50	–	x		x					–	–
81	51	–	x		x				x	–	–
82	52	–	x		x			x		–	–
83	53	–	x		x			x	x	–	–
84	54	–	x		x		x			–	–
85	55	–	x		x		x		x	–	–
86	56	–	x		x		x	x		–	–
87	57	–	x		x		x	x	x	–	–
88	58	–	x		x	x				–	–
89	59	–	x		x	x			x	–	–
90	5A	–	x		x	x		x		–	–

Bit no.		7	6	5	4	3	2	1	0		
8-bit value	Hexadecimal	Retrieve 0 Save 1	Not defined	Binary number codes	Binary number codes n	Binary number codes	Binary number codes	Binary number codes	Binary number codes	Scene number	Retrieve A Save S No reaction –
91	5B	–	x		x	x		x	x	–	–
92	5C	–	x		x	x	x			–	–
93	5D	–	x		x	x	x		x	–	–
94	5E	–	x		x	x	x	x		–	–
95	5F	–	x		x	x	x	x	x	–	–
96	60	–	x	x						–	–
97	61	–	x	x					x	–	–
98	62	–	x	x				x		–	–
99	63	–	x	x				x	x	–	–
100	64	–	x	x			x			–	–
101	65	–	x	x			x		x	–	–
102	66	–	x	x			x	x		–	–
103	67	–	x	x			x	x	x	–	–
104	68	–	x	x		x				–	–
105	69	–	x	x		x			x	–	–
106	6A	–	x	x		x		x		–	–
107	6B	–	x	x		x		x	x	–	–
108	6C	–	x	x		x	x			–	–
109	6D	–	x	x		x	x		x	–	–
110	6E	–	x	x		x	x	x		–	–
111	6F	–	x	x		x	x	x	x	–	–
112	70	–	x	x	x					–	–
113	71	–	x	x	x				x	–	–
114	72	–	x	x	x			x		–	–
115	73	–	x	x	x			x	x	–	–
116	74	–	x	x	x		x			–	–
117	75	–	x	x	x		x		x	–	–
118	76	–	x	x	x		x	x		–	–
119	77	–	x	x	x		x	x	x	–	–
120	78	–	x	x	x	x				–	–
121	79	–	x	x	x	x			x	–	–
122	7A	–	x	x	x	x		x		–	–
123	7B	–	x	x	x	x		x	x	–	–
124	7C	–	x	x	x	x	x			–	–
125	7D	–	x	x	x	x	x		x	–	–
126	7E	–	x	x	x	x	x	x		–	–
127	7F	–	x	x	x	x	x	x	x	–	–
128	80	1								1	W
129	81	1							x	2	W
130	82	1						x		3	W
131	83	1						x	x	4	W
132	84	1					x			5	W
133	85	1					x		x	6	W
134	86	1					x	x		7	W
135	87	1					x	x	x	8	W
136	88	1				x				9	W
137	89	1				x			x	10	W
138	8A	1				x		x		11	W
139	8B	1				x		x	x	12	W
140	8C	1				x	x			13	W
141	8D	1				x	x		x	14	W
142	8E	1				x	x	x		15	W
143	8F	1				x	x	x	x	16	W
144	90	1			x					17	W
145	91	1			x				x	18	W
146	92	1			x			x		19	W
147	93	1			x			x	x	20	W
148	94	1			x		x			21	W
149	95	1			x		x		x	22	W
150	96	1			x		x	x		23	W
151	97	1			x		x	x	x	24	W
152	98	1			x	x				25	W
153	99	1			x	x			x	26	W

Bit no.		7	6	5	4	3	2	1	0		
8-bit value	Hexadecimal	Retrieve 0 Save 1	Not defined	Binary number codes	Binary number codes n	Binary number codes	Binary number codes	Binary number codes	Binary number codes	Scene number	Retrieve A Save S No reaction –
154	9A	1			x	x		x		27	W
155	9B	1			x	x		x	x	28	W
156	9C	1			x	x	x			29	W
157	9D	1			x	x	x		x	30	W
158	9E	1			x	x	x	x		31	W
159	9F	1			x	x	x	x	x	32	W
160	A0	1		x						33	W
161	A1	1		x					x	34	W
162	A2	1		x				x		35	W
163	A3	1		x				x	x	36	W
164	A4	1		x			x			37	W
165	A5	1		x			x		x	38	W
166	A6	1		x			x	x		39	W
167	A7	1		x			x	x	x	40	W
168	A8	1		x		x				41	W
169	A9	1		x		x			x	42	W
170	AA	1		x		x		x		43	W
171	AB	1		x		x		x	x	44	W
172	AC	1		x		x	x			45	W
173	AD	1		x		x	x		x	46	W
174	AE	1		x		x	x	x		47	W
175	AF	1		x		x	x	x	x	48	W
176	B0	1		x	x					49	W
177	B1	1		x	x				x	50	W
178	B2	1		x	x			x		51	W
179	B3	1		x	x			x	x	52	W
180	B4	1		x	x		x			53	W
181	B5	1		x	x		x		x	54	W
182	B6	1		x	x		x	x		55	W
183	B7	1		x	x		x	x	x	56	W
184	B8	1		x	x	x				57	W
185	B9	1		x	x	x			x	58	W
186	BA	1		x	x	x		x		59	W
187	BB	1		x	x	x		x	x	60	W
188	BC	1		x	x	x	x			61	W
189	BD	1		x	x	x	x		x	62	W
190	BE	1		x	x	x	x	x		63	W
191	BF	1		x	x	x	x	x	x	64	W
192	C0	–	x							–	–
193	C1	–	x						x	–	–
194	C2	–	x					x		–	–
195	C3	–	x					x	x	–	–
196	C4	–	x				x			–	–
197	C5	–	x				x		x	–	–
198	C6	–	x				x	x		–	–
199	C7	–	x				x	x	x	–	–
200	C8	–	x			x				–	–
201	C9	–	x			x			x	–	–
202	CA	–	x			x		x		–	–
203	CB	–	x			x		x	x	–	–
204	CC	–	x			x	x			–	–
205	CD	–	x			x	x		x	–	–
206	CE	–	x			x	x	x		–	–
207	CF	–	x			x	x	x	x	–	–
208	D0	–	x		x					–	–
209	D1	–	x		x				x	–	–
210	D2	–	x		x			x		–	–
211	D3	–	x		x			x	x	–	–
212	D4	–	x		x		x			–	–
213	D5	–	x		x		x		x	–	–
214	D6	–	x		x		x	x		–	–
215	D7	–	x		x		x	x	x	–	–
216	D8	–	x		x	x				–	–

Bit no.		7	6	5	4	3	2	1	0		
8-bit value	Hexadecimal	Retrieve 0 Save 1	Not defined	Binary number codes	Binary number codes n	Binary number codes	Binary number codes	Binary number codes	Binary number codes	Scene number	Retrieve A Save S No reaction –
217	D9	–	x		x	x			x	–	–
218	DA	–	x		x	x		x		–	–
219	DB	–	x		x	x		x	x	–	–
220	DC	–	x		x	x	x			–	–
221	DD	–	x		x	x	x		x	–	–
222	DE	–	x		x	x	x	x		–	–
223	DF	–	x		x	x	x	x	x	–	–
224	E0	–	x	x						–	–
225	E1	–	x	x					x	–	–
226	E2	–	x	x				x		–	–
227	E3	–	x	x				x	x	–	–
228	E4	–	x	x			x			–	–
229	E5	–	x	x			x		x	–	–
230	E6	–	x	x			x	x		–	–
231	E7	–	x	x			x	x	x	–	–
232	E8	–	x	x		x				–	–
233	E9	–	x	x		x			x	–	–
234	EA	–	x	x		x		x		–	–
235	EB	–	x	x		x		x	x	–	–
236	EC	–	x	x		x	x			–	–

Bit no.		7	6	5	4	3	2	1	0		
8-bit value	Hexadecimal	Retrieve 0 Save 1	Not defined	Binary number codes	Binary number codes n	Binary number codes	Binary number codes	Binary number codes	Binary number codes	Scene number	Retrieve A Save S No reaction –
237	ED	–	x	x		x	x		x	–	–
238	EE	–	x	x		x	x	x		–	–
239	EF	–	x	x		x	x	x	x	–	–
240	F0	–	x	x	x					–	–
241	F1	–	x	x	x				x	–	–
242	F2	–	x	x	x			x		–	–
243	F3	–	x	x	x			x	x	–	–
244	F4	–	x	x	x		x			–	–
245	F5	–	x	x	x		x		x	–	–
246	F6	–	x	x	x		x	x		–	–
247	F7	–	x	x	x		x	x	x	–	–
248	F8	–	x	x	x	x				–	–
249	F9	–	x	x	x	x			x	–	–
250	FA	–	x	x	x	x		x		–	–
251	FB	–	x	x	x	x		x	x	–	–
252	FC	–	x	x	x	x	x			–	–
253	FD	–	x	x	x	x	x		x	–	–
254	FE	–	x	x	x	x	x	x		–	–
255	FF	–	x	x	x	x	x	x	x	–	–

Tab. 7: Code table 8-bit scene

13.2 Code table for 8-bit status byte (Switch)

The following code table contains the telegram code of the group object Status information belonging to a switch output.

The 8-bit status byte indicates all pending forced operations and functions that affect the switching of the output.

x = value 1, applicable

empty = value 0, not applicable

Bit no.		7	6	5	4	3	2	1	0	
8-bit value	Hexadecimal	i-bus® Tool	Staircase lighting Permanent ON.	Safety priority 3	Safety priority 2	Safety priority 1	Forced operation	Disable	Not used	Output operability
0	00									Via KNX
1	01									Disabled
2	02							x		Disabled
3	03							x		Disabled
4	04						x			Disabled
5	05						x			Disabled
6	06						x	x		Disabled
7	07						x	x		Disabled
8	08					x				Disabled
9	09					x				Disabled
10	0A					x		x		Disabled
11	0B					x		x		Disabled
12	0C					x	x			Disabled
13	0D					x	x			Disabled
14	0E					x	x	x		Disabled
15	0F					x	x	x		Disabled
16	10				x					Disabled
17	11				x					Disabled
18	12				x			x		Disabled
19	13				x			x		Disabled
20	14				x		x			Disabled
21	15				x		x			Disabled
22	16				x		x	x		Disabled
23	17				x		x	x		Disabled
24	18				x	x				Disabled
25	19				x	x				Disabled
26	1A				x	x		x		Disabled
27	1B				x	x		x		Disabled
28	1C				x	x	x			Disabled
29	1D				x	x	x			Disabled
30	1E				x	x	x	x		Disabled
31	1F				x	x	x	x		Disabled
32	20			x						Disabled
33	21			x						Disabled
34	22			x				x		Disabled
35	23			x				x		Disabled
36	24			x			x			Disabled
37	25			x			x			Disabled
38	26			x			x	x		Disabled
39	27			x			x	x		Disabled
40	28			x		x				Disabled
41	29			x		x				Disabled
42	2A			x		x		x		Disabled
43	2B			x		x		x		Disabled
44	2C			x		x	x			Disabled
45	2D			x		x	x			Disabled
46	2E			x		x	x	x		Disabled
47	2F			x		x	x	x		Disabled
48	30			x	x					Disabled

Bit no.		7	6	5	4	3	2	1	0	
8-bit value	Hexadecimal	i-bus® Tool	Staircase lighting Permanent ON.	Safety priority 3	Safety priority 2	Safety priority 1	Forced operation	Disable	Not used	Output operability
49	31			x	x					Disabled
50	32			x	x			x		Disabled
51	33			x	x			x		Disabled
52	34			x	x		x			Disabled
53	35			x	x		x			Disabled
54	36			x	x		x	x		Disabled
55	37			x	x		x	x		Disabled
56	38			x	x	x				Disabled
57	39			x	x	x				Disabled
58	3A			x	x	x		x		Disabled
59	3B			x	x	x		x		Disabled
60	3C			x	x	x	x			Disabled
61	3D			x	x	x	x			Disabled
62	3E			x	x	x	x	x		Disabled
63	3F			x	x	x	x	x		Disabled
64	40		x							I-bus + KNX
65	41		x							Disabled
66	42		x					x		Disabled
67	43		x					x		Disabled
68	44		x				x			Disabled
69	45		x				x			Disabled
70	46		x				x	x		Disabled
71	47		x				x	x		Disabled
72	48		x			x				Disabled
73	49		x			x				Disabled
74	4A		x			x		x		Disabled
75	4B		x			x		x		Disabled
76	4C		x			x	x			Disabled
77	4D		x			x	x			Disabled
78	4E		x			x	x	x		Disabled
79	4F		x			x	x	x		Disabled
80	50		x		x					Disabled
81	51		x		x					Disabled
82	52		x		x			x		Disabled
83	53		x		x			x		Disabled
84	54		x		x		x			Disabled
85	55		x		x		x			Disabled
86	56		x		x		x	x		Disabled
87	57		x		x		x	x		Disabled
88	58		x		x	x				Disabled
89	59		x		x	x				Disabled
90	5A		x		x	x		x		Disabled
91	5B		x		x	x		x		Disabled
92	5C		x		x	x	x			Disabled
93	5D		x		x	x	x			Disabled
94	5E		x		x	x	x	x		Disabled
95	5F		x		x	x	x	x		Disabled
96	60		x	x						Disabled
97	61		x	x						Disabled

Bit no.		7	6	5	4	3	2	1	0	
8-bit value	Hexadecimal	i-bus® Tool	Staircase lighting Permanent ON.	Safety priority 3	Safety priority 2	Safety priority 1	Forced operation	Disable	Not used	Output operability
98	62		x	x				x		Disabled
99	63		x	x				x		Disabled
100	64		x	x			x			Disabled
101	65		x	x			x			Disabled
102	66		x	x			x	x		Disabled
103	67		x	x			x	x		Disabled
104	68		x	x		x				Disabled
105	69		x	x		x				Disabled
106	6A		x	x		x		x		Disabled
107	6B		x	x		x		x		Disabled
108	6C		x	x		x	x			Disabled
109	6D		x	x		x	x			Disabled
110	6E		x	x		x	x	x		Disabled
111	6F		x	x		x	x	x		Disabled
112	70		x	x	x					Disabled
113	71		x	x	x					Disabled
114	72		x	x	x			x		Disabled
115	73		x	x	x			x		Disabled
116	74		x	x	x		x			Disabled
117	75		x	x	x		x			Disabled
118	76		x	x	x		x	x		Disabled
119	77		x	x	x		x	x		Disabled
120	78		x	x	x	x				Disabled
121	79		x	x	x	x				Disabled
122	7A		x	x	x	x		x		Disabled
123	7B		x	x	x	x		x		Disabled
124	7C		x	x	x	x	x			Disabled
125	7D		x	x	x	x	x			Disabled
126	7E		x	x	x	x	x	x		Disabled
127	7F		x	x	x	x	x	x		Disabled
128	80	x								Manual only
129	81	x								Disabled
130	82	x						x		Disabled
131	83	x						x		Disabled
132	84	x					x			Disabled
133	85	x					x			Disabled
134	86	x					x	x		Disabled
135	87	x					x	x		Disabled
136	88	x				x				Disabled
137	89	x				x				Disabled
138	8A	x				x		x		Disabled
139	8B	x				x		x		Disabled
140	8C	x				x	x			Disabled
141	8D	x				x	x			Disabled
142	8E	x				x	x	x		Disabled
143	8F	x				x	x	x		Disabled
144	90	x			x					Disabled
145	91	x			x					Disabled
146	92	x			x			x		Disabled
147	93	x			x			x		Disabled
148	94	x			x		x			Disabled
149	95	x			x		x			Disabled
150	96	x			x		x	x		Disabled
151	97	x			x		x	x		Disabled
152	98	x			x	x				Disabled
153	99	x			x	x				Disabled
154	9A	x			x	x		x		Disabled
155	9B	x			x	x		x		Disabled
156	9C	x			x	x	x			Disabled
157	9D	x			x	x	x			Disabled
158	9E	x			x	x	x	x		Disabled
159	9F	x			x	x	x	x		Disabled
160	A0	x		x						Disabled

Bit no.		7	6	5	4	3	2	1	0	
8-bit value	Hexadecimal	i-bus® Tool	Staircase lighting Permanent ON.	Safety priority 3	Safety priority 2	Safety priority 1	Forced operation	Disable	Not used	Output operability
161	A1	x		x						Disabled
162	A2	x		x				x		Disabled
163	A3	x		x				x		Disabled
164	A4	x		x			x			Disabled
165	A5	x		x			x			Disabled
166	A6	x		x			x	x		Disabled
167	A7	x		x			x	x		Disabled
168	A8	x		x		x				Disabled
169	A9	x		x		x				Disabled
170	AA	x		x		x		x		Disabled
171	AB	x		x		x		x		Disabled
172	AC	x		x		x	x			Disabled
173	AD	x		x		x	x			Disabled
174	AE	x		x		x	x	x		Disabled
175	AF	x		x		x	x	x		Disabled
176	B0	x		x	x					Disabled
177	B1	x		x	x					Disabled
178	B2	x		x	x			x		Disabled
179	B3	x		x	x			x		Disabled
180	B4	x		x	x		x			Disabled
181	B5	x		x	x		x			Disabled
182	B6	x		x	x		x	x		Disabled
183	B7	x		x	x		x	x		Disabled
184	B8	x		x	x	x				Disabled
185	B9	x		x	x	x				Disabled
186	BA	x		x	x	x		x		Disabled
187	BB	x		x	x	x		x		Disabled
188	BC	x		x	x	x	x			Disabled
189	BD	x		x	x	x	x			Disabled
190	BE	x		x	x	x	x	x		Disabled
191	BF	x		x	x	x	x	x		Disabled
192	C0	x	x							Manual only
193	C1	x	x							Disabled
194	C2	x	x					x		Disabled
195	C3	x	x					x		Disabled
196	C4	x	x				x			Disabled
197	C5	x	x				x			Disabled
198	C6	x	x				x	x		Disabled
199	C7	x	x				x	x		Disabled
200	C8	x	x			x				Disabled
201	C9	x	x			x				Disabled
202	CA	x	x			x		x		Disabled
203	CB	x	x			x		x		Disabled
204	CC	x	x			x	x			Disabled
205	CD	x	x			x	x			Disabled
206	CE	x	x			x	x	x		Disabled
207	CF	x	x			x	x	x		Disabled
208	D0	x	x		x					Disabled
209	D1	x	x		x					Disabled
210	D2	x	x		x			x		Disabled
211	D3	x	x		x			x		Disabled
212	D4	x	x		x		x			Disabled
213	D5	x	x		x		x			Disabled
214	D6	x	x		x		x	x		Disabled
215	D7	x	x		x		x	x		Disabled
216	D8	x	x		x	x				Disabled
217	D9	x	x		x	x				Disabled
218	DA	x	x		x	x		x		Disabled
219	DB	x	x		x	x		x		Disabled
220	DC	x	x		x	x	x			Disabled
221	DD	x	x		x	x	x			Disabled
222	DE	x	x		x	x	x	x		Disabled
223	DF	x	x		x	x	x	x		Disabled

Bit no.		7	6	5	4	3	2	1	0	
8-bit value	Hexadecimal	i-bus® Tool	Staircase lighting Permanent ON.	Safety priority 3	Safety priority 2	Safety priority 1	Forced operation	Disable	Not used	Output operability
224	E0	x	x	x						Disabled
225	E1	x	x	x						Disabled
226	E2	x	x	x				x		Disabled
227	E3	x	x	x				x		Disabled
228	E4	x	x	x			x			Disabled
229	E5	x	x	x			x			Disabled
230	E6	x	x	x			x	x		Disabled
231	E7	x	x	x			x	x		Disabled
232	E8	x	x	x		x				Disabled
233	E9	x	x	x		x				Disabled
234	EA	x	x	x		x		x		Disabled
235	EB	x	x	x		x		x		Disabled
236	EC	x	x	x		x	x			Disabled
237	ED	x	x	x		x	x			Disabled
238	EE	x	x	x		x	x	x		Disabled
239	EF	x	x	x		x	x	x		Disabled

Bit no.		7	6	5	4	3	2	1	0	
8-bit value	Hexadecimal	i-bus® Tool	Staircase lighting Permanent ON.	Safety priority 3	Safety priority 2	Safety priority 1	Forced operation	Disable	Not used	Output operability
240	F0	x	x	x	x					Disabled
241	F1	x	x	x	x					Disabled
242	F2	x	x	x	x			x		Disabled
243	F3	x	x	x	x			x		Disabled
244	F4	x	x	x	x		x			Disabled
245	F5	x	x	x	x		x			Disabled
246	F6	x	x	x	x		x	x		Disabled
247	F7	x	x	x	x		x	x		Disabled
248	F8	x	x	x	x	x				Disabled
249	F9	x	x	x	x	x				Disabled
250	FA	x	x	x	x	x		x		Disabled
251	FB	x	x	x	x	x		x		Disabled
252	FC	x	x	x	x	x	x			Disabled
253	FD	x	x	x	x	x	x			Disabled
254	FE	x	x	x	x	x	x	x		Disabled
255	FF	x	x	x	x	x	x	x		Disabled

Tab. 8: Code table for 8-bit status byte (Switch)

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