

2020

# KNX Combi Switch Actuators SAH/S

Competence Center Europe – Smart Buildings

Thorsten Reibel

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# KNX Combi Switch Actuators SAH/S

Switch to a smarter tomorrow



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# Agenda

Why new KNX Switch Actuators?

Overview of all new Switch Actuators

KNX Combi Switch Actuators

- Range Overview and Functions

- ETS Application

- Commercial and Marketing Aspects

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# KNX Combi Switch Actuators SAH/S

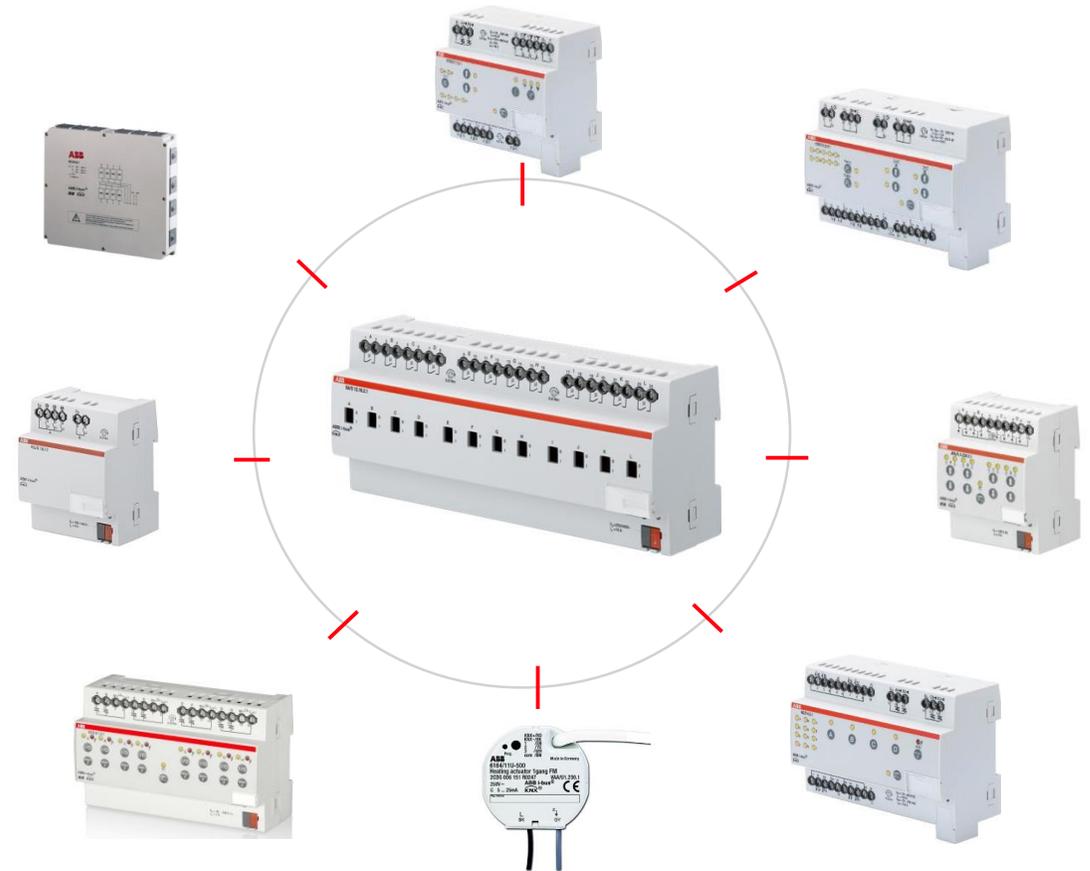
Why a new range of KNX Switch Actuators from ABB?

# KNX Combi Switch Actuators SAH/S

Why a new range of KNX Switch Actuators from ABB?

## Switch actuators still needed?

- Actuators carry out the function needed which finally results in the function in the building for the user
  - Turn on/off of lighting
  - Operation of socket outlets
  - Control of motors and pumps
  - Control of fan
  - Opening/Closing shutter, blinds, curtains or windows
- Though for many applications dedicated actuators are existing, especially for lighting control general switch actuators are very important and often used, with low costs per channel
- Strong market share of DALI for lighting control did not result in reduced number of switch actuators but in a growing market
- Energy efficient illumination with LED lamps allows economical and sophisticated lighting solutions with switch actuators, galvanic separation of the load, even light scenes are possible



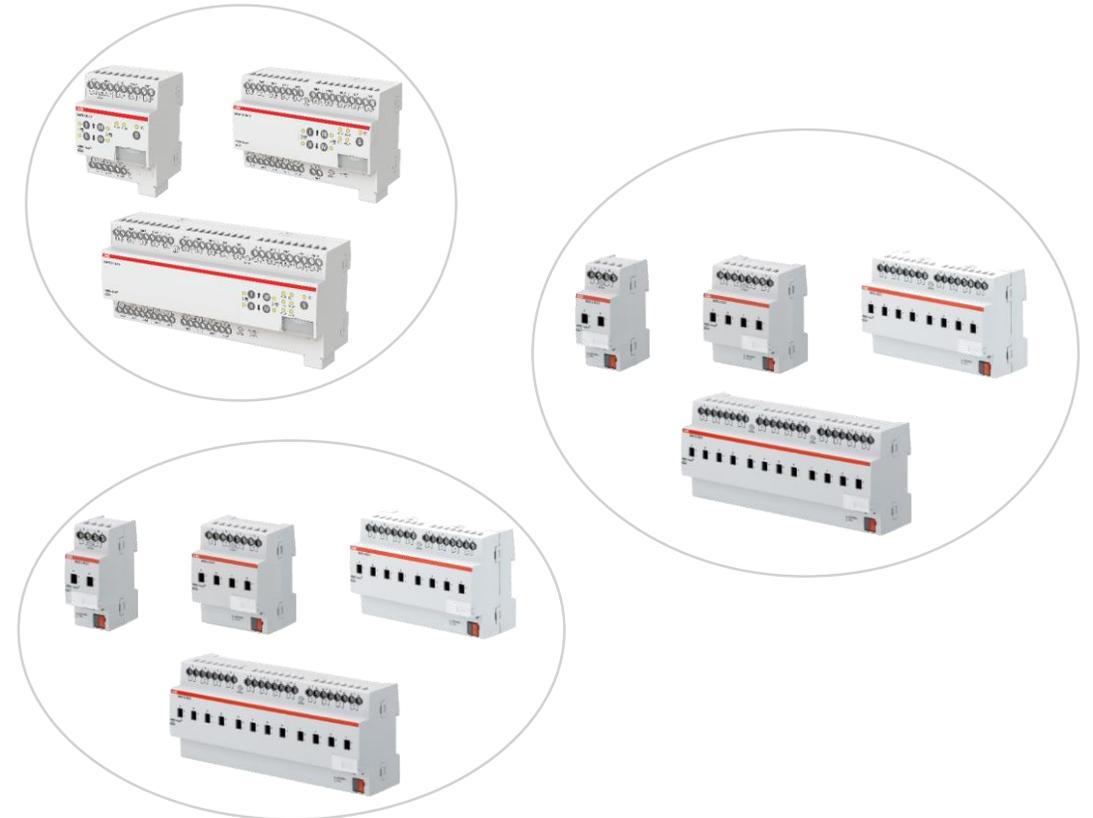
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# KNX Combi Switch Actuators SAH/S

Why a new range of KNX Switch Actuators from ABB?

## Requirements

- Closing product range gaps (e.g. number of channels or functionality)
- Increasing number of manufacturers and products needs a new and state of the art actuator range from ABB
- Reduction of size → less space per channel
- Being prepared for future developments (Software functions, IoT services)
- Segmentation → for each application and demand the right product
- Significant evolution of ABB's KNX switch actuator range, continuation of simplicity and reliability, but development of proven functions
- Advanced usability by optimized manual operation and ETS application



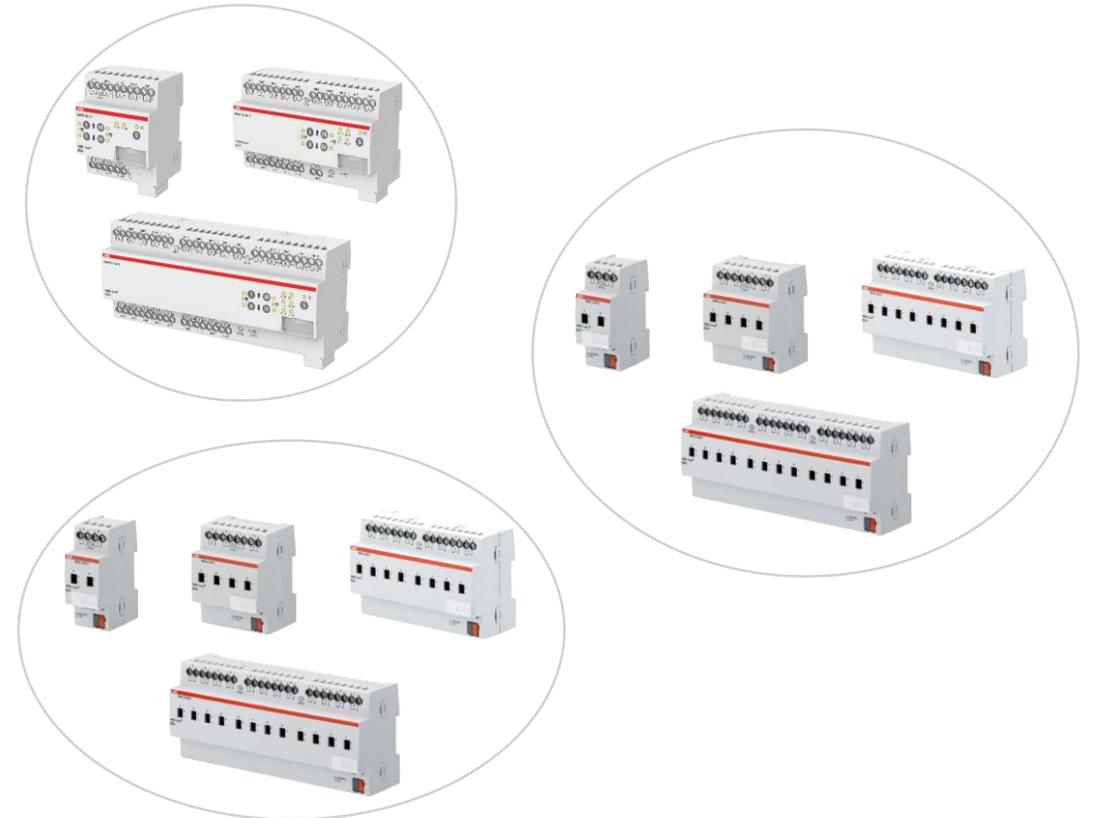
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# KNX Combi Switch Actuators SAH/S

Why a new range of KNX Switch Actuators from ABB?

## Requirements

- Being prepared for worldwide usage with different technical standards
- Being prepared for future software extensions
- Switch Actuators as a key product in KNX Building Automation are very important for the market and an all-inclusive manufacturer like ABB
- Provision of high class products with design and production in Germany
- State of the art product family for today and in the next future



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# KNX Combi Switch Actuators SAH/S

Range overview of all new Switch Actuators

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# KNX Combi Switch Actuators SAH/S

## Next Generation Switching

### Combi Switch Actuators

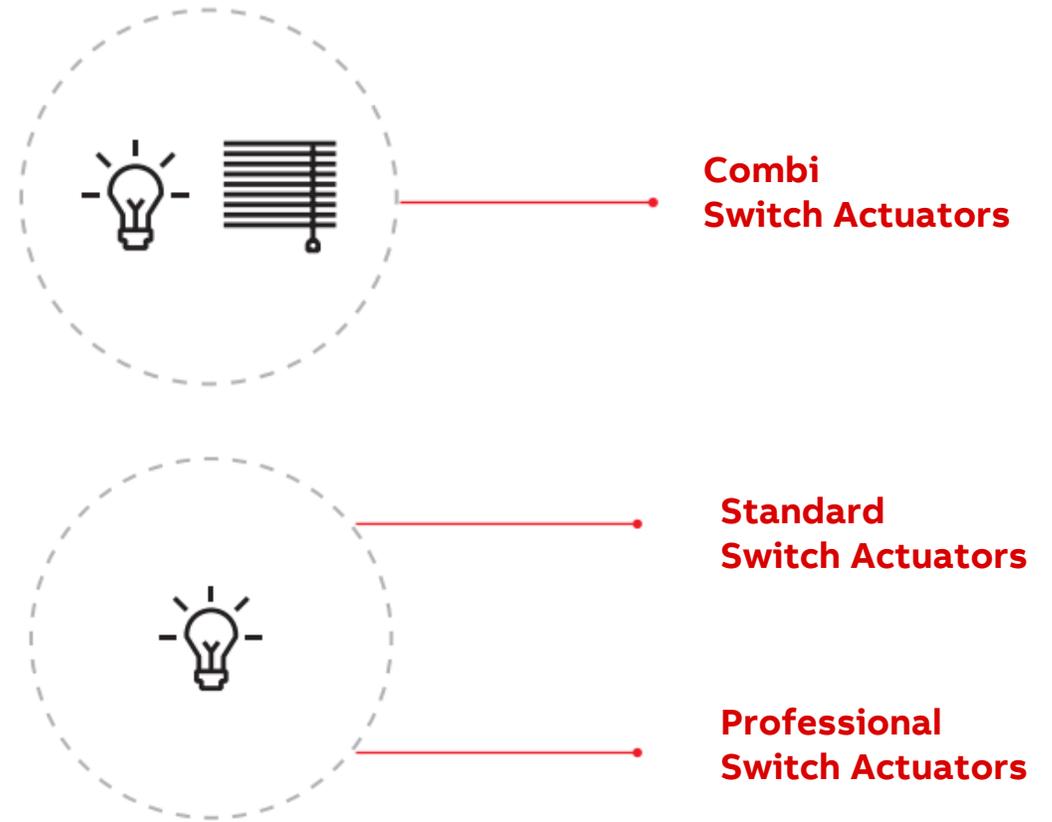
- The 9 Combi devices are combining two applications: switching and shading. The products are ideally made for residential usage to offer greatest flexibility

### Standard Switch Actuators

- These 12 devices are building the Standard when it comes to switching applications for commercial buildings. During the development we focused on providing a cost optimized selection of products, that matches the needs of commercial projects

### Professional Switch Actuators

- The professional series includes 8 switch actuators made for high switching capacity. This portfolio has been developed to suit the high requirements of industry standards



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# KNX Combi Switch Actuators SAH/S

## Next Generation Switching

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### Combi Switch Actuators



ABB i-bus® KNX Combi Switch Actuators feature 9 compact devices with high channel density and selectable switching and shading functionality optimally suited to flexible application in residential projects.

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### Standard Switch Actuators



These 12 devices are building the Standard when it comes to switching applications for commercial buildings. During the development we focused on providing a cost optimized selection of products, that matches the needs of commercial projects.

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### Professional Switch Actuators

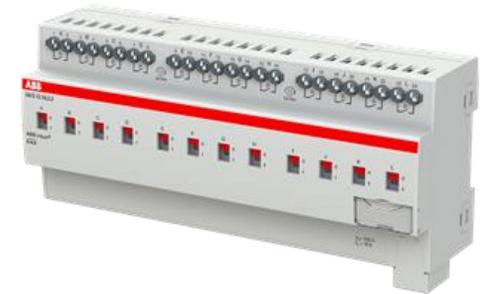


ABB i-bus® KNX Professional Switch Actuators offer devices with high switching capacity and enhanced energy management functionality. These 8 devices have been developed to suit the high requirements of industry standards.

# KNX Combi Switch Actuators SAH/S

## Next Generation Switching

### Combi Switch Actuators



- Compact + switch/shutter modes
- 8 (4MW), 16 (8MW) & 24 (12 MW) channels
- 6A, 10A & 16A - AC1 ratings
- 3 x 3 devices

### Standard Switch Actuators



- 2, 4, 8 & 12 channels
- 6A, 10A & 16A - AC1 ratings
- 3 x 4 devices

### Professional Switch Actuators



- 2, 4, 8 & 12 channels
- 16A C-load + power measurement
- 2 x 4 devices

Residential



Applications



Commercial

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# KNX Combi Switch Actuators SAH/S

Standard Switch Actuators

# KNX Combi Switch Actuators SAH/S

## Standard Switch Actuators

### Key Characteristics

- 'High-runner' types for all standard switching applications
- Data
  - 2 / 4 / 8 / 12 outputs
  - 6A, 10A and 16A (AC1)
  - Manual operation (voltage independent)
  - Combi screw-head terminals
  - Single application, smart features
  - New housing
  - Cost optimized

### 6A (4 devices)



### 10A (4 devices)



### 16A (4 devices)



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# KNX Combi Switch Actuators SAH/S

Professional Switch Actuators

# KNX Combi Switch Actuators SAH/S

## Professional Switch Actuators

### Key Characteristics

- High-switching-capacity devices with extended functionality for industry standard applications
- Data
  - 2 / 4 / 8 / 12 outputs
  - 16A C-Load (high capacity)
  - Current / Power data
  - Manual operation (voltage independent)
  - Combi screw-head terminals
  - Single application, smart features
  - New housing

### 16A C-load (4 devices)



**Key feature: High load capacity**

### 16A C-load, Current & Power (4 devices)



**Key feature: Power/Load data**

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# KNX Combi Switch Actuators SAH/S

Features “KNX Combi Actuators SAH/S”

# KNX Combi Switch Actuators SAH/S

## Combi Switch Actuators

### Combi range features

- High channel density
- Selectable switching and shading
- Proven connection terminals with screws
- Each channel with individual phase input
- Innovative Keypad usage



# KNX Combi Switch Actuators SAH/S

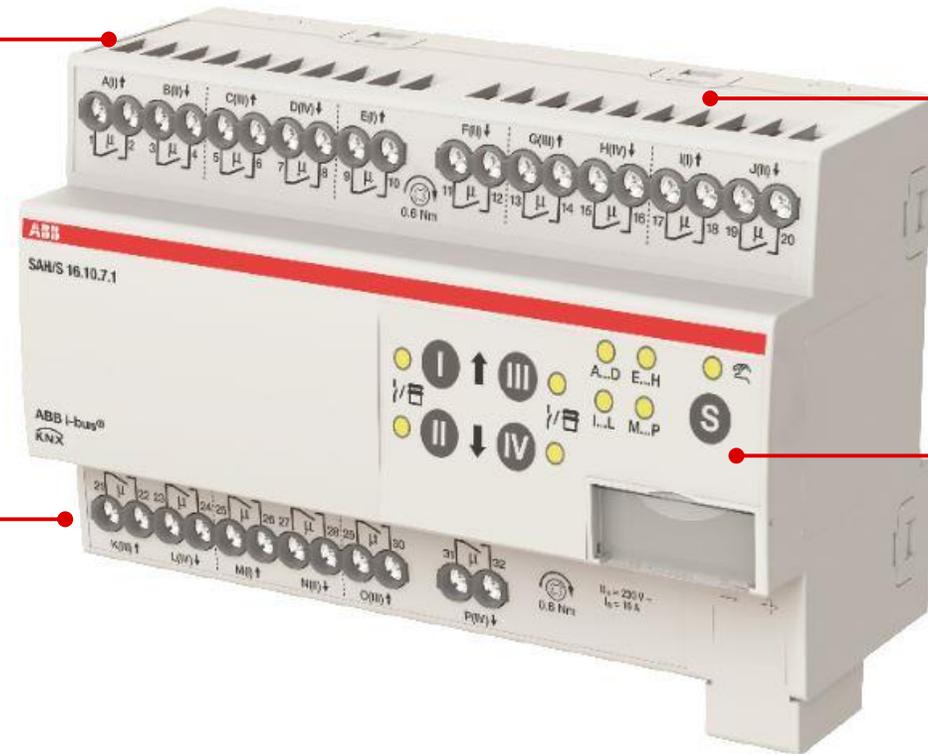
## Combi Switch Actuators

### Screw head terminals

- Simplify mounting of the device
- Easy connection of cables with large diameters thanks to the use of a 6 mm terminal and a combi screw head

### High channel density

- Compact devices with high channel density (2 channels per module width) that double the space in the distribution board



### Relay outputs

- Current load rating between 6 and 16 A
- Individual phase per output
- Mixed use of 1-phase load and motor with 2 relays

### Manual operation concept

- With the keypad it is possible to choose the outputs (A – P) that are needed. One functionality includes four outputs.
- Locking the manual operation protects the device against unauthorized access

# KNX Combi Switch Actuators SAH/S

## Combi Switch Actuators

### Key Characteristics

- Compact, high-channel-density devices with selectable switching & shading functionality
- Data
  - 8 / 16 / 24 outputs
  - 6A / 10A / 16A – AC1
  - Compact form: 2 channels per module width
  - Manual operation (KNX voltage dependent)
  - Combi screw-head terminals
  - Single application, smart features
  - New housing
  - Combi switching & shading

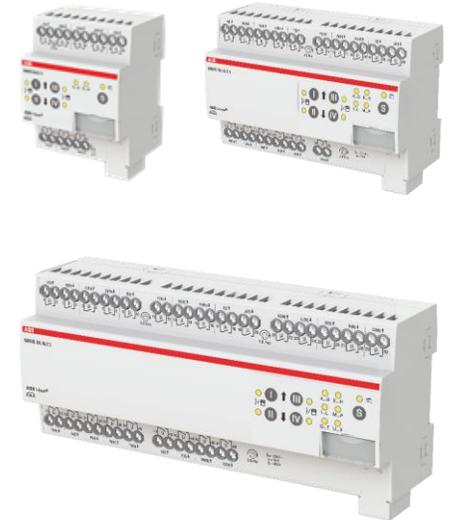
### 6A (3 devices)



### 10A (3 devices)



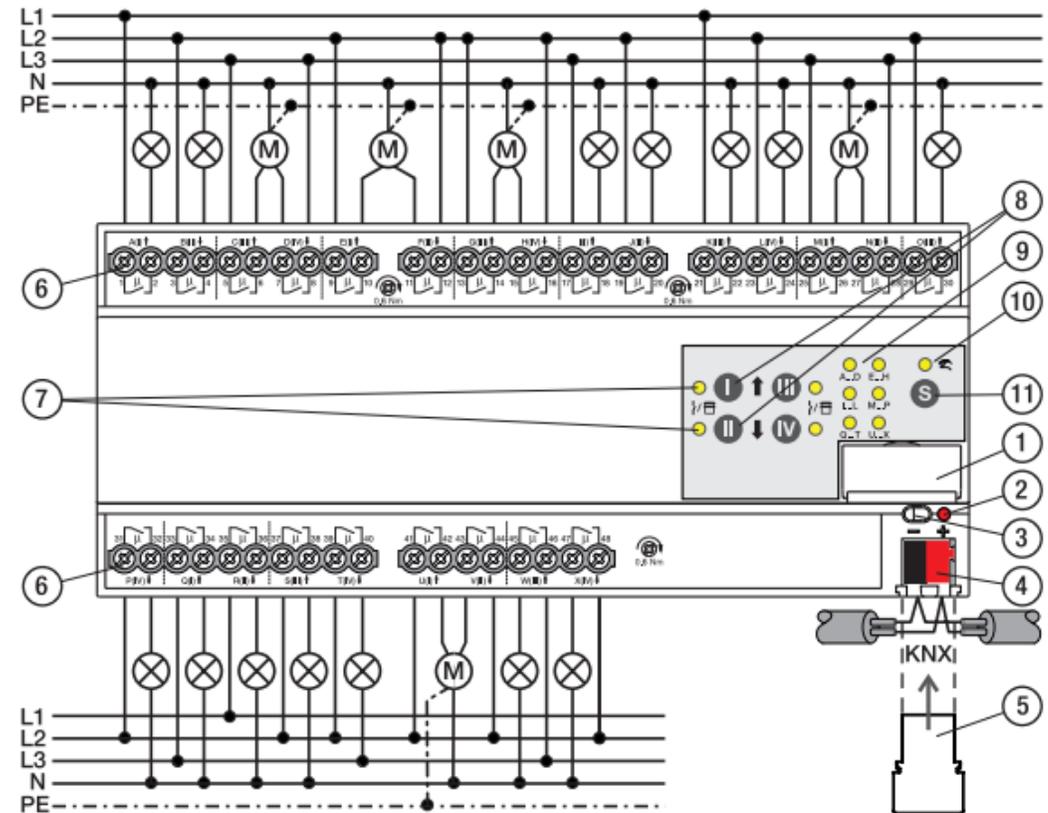
### 16A (3 devices)



# KNX Combi Switch Actuators SAH/S

## Connection Diagram

1. Label Carriers
2. Programming LED
3. Programming Button
4. Bus Connection Terminal
5. Cover Cap
6. Load Circuit
7. Output Status LED (yellow)
8. Output Button
9. Group LED (yellow)
10. Manual Operation LED (yellow)
11. S-Button (manual operation/output selection/central off)



# KNX Combi Switch Actuators SAH/S

## Selection Table

Overview about hardware performance (Relay, Power, Loads) and software features to select the right device

### Differences between 6/10/16 A outputs

- Rated current  $I_N$  distinguish the components 6A, 10A and 16A, according to DIN EN 60947-4-1 (AC1 operation with  $\cos \phi = 0,8$ )
- The continuous current and finally the total current of each device is important for the design of the circuit, the line protection and the switch actuator
- Depending on the rules and requirements in different countries (6, 10 or 16A electrical circuits) the right devices from ABB can be selected
- Max. peak inrush-current is the same for all, resulting in the same assignments for max. power for each type of load

	SAH/S 8.6.7.1 SAH/S 16.6.7.1 SAH/S 24.6.7.1	SAH/S 8.10.7.1 SAH/S 16.10.7.1 SAH/S 24.10.7.1	SAH/S 8.16.7.1 SAH/S 16.16.7.1 SAH/S 24.16.7.1
Range	Combi	Combi	Combi
$I_n$ rated current (A) <sup>2)</sup>	6 A	10 A <sup>2)</sup>	16 A <sup>2)</sup>
$U_n$ rated voltage (V)	230 V AC	230 V AC	230 V AC
AC1 operation ( $\cos \phi = 0.8$ ) DIN EN 60947-4-1	6 A	10 A	16 A
AC3 operation ( $\cos \phi = 0.45$ ) DIN EN 60947-4-1	6 A	6 A	6 A
C-Load switching capacity (200 $\mu$ F)	–	–	–
Minimum switching capacity	100 mA/12 V	100 mA/12 V	100 mA/12 V
DC current switching capacity (resistive load)	6 A/24 V =	6 A/24 V =	6 A/24 V =
Mechanical service life	> 10 <sup>6</sup>	> 10 <sup>6</sup>	> 10 <sup>6</sup>
Electronic endurance to IEC 60947-4-1:			
– Rated current AC1 (240 V/0.8)	100,000	100,000	100,000
– Rated current AC3 (240 V/0.45)	6,000	6,000	6,000
Incandescent lamp load at 230 V AC	1,200 W	1,200 W	1,200 W
Fluorescent lamp T5 / T8:			
– Uncorrected	800 W	800 W	800 W
Low-voltage halogen lamps:			
– Inductive transformer	800 W	800 W	800 W
– Electronic transformer	1,000 W	1,000 W	1,000 W
Halogen lamp 230 V	1,000 W	1,000 W	1,000 W
Mercury-vapour lamps:			
– Uncorrected	1,000 W	1,000 W	1,000 W
– Parallel compensated	800 W	800 W	800 W
Sodium-vapour lamps:			
– Uncorrected	1,000 W	1,000 W	1,000 W
– Parallel compensated	800 W	800 W	800 W
LED lamps/energy saving lamps	250 W	250 W	250 W
Motor load	1380 W	1380 W	1380 W
Max. peak inrush-current $I_p$ (150 $\mu$ s)	200 A	200 A	200 A
Max. peak inrush-current $I_p$ (250 $\mu$ s)	160 A	160 A	160 A
Max. peak inrush-current $I_p$ (600 $\mu$ s)	100 A	100 A	100 A
Number of electronic ballasts (T5/T8, single element): <sup>2)</sup>			
18 W (ABB ballasts 1 x 18 SF)	10 ballasts	10 ballasts	10 ballasts
24 W (ABB ballasts 1 x 24 CY)	10 ballasts	10 ballasts	10 ballasts
36 W (ABB ballasts 1 x 36 CF)	7 ballasts	7 ballasts	7 ballasts
58 W (ABB ballasts 1 x 58 CF)	5 ballasts	5 ballasts	5 ballasts
80 W (Helvar EL 1 x 80 SC)	3 ballasts	3 ballasts	3 ballasts

# KNX Combi Switch Actuators SAH/S

Range

## Main technical Differences between Combi Switch Actuators

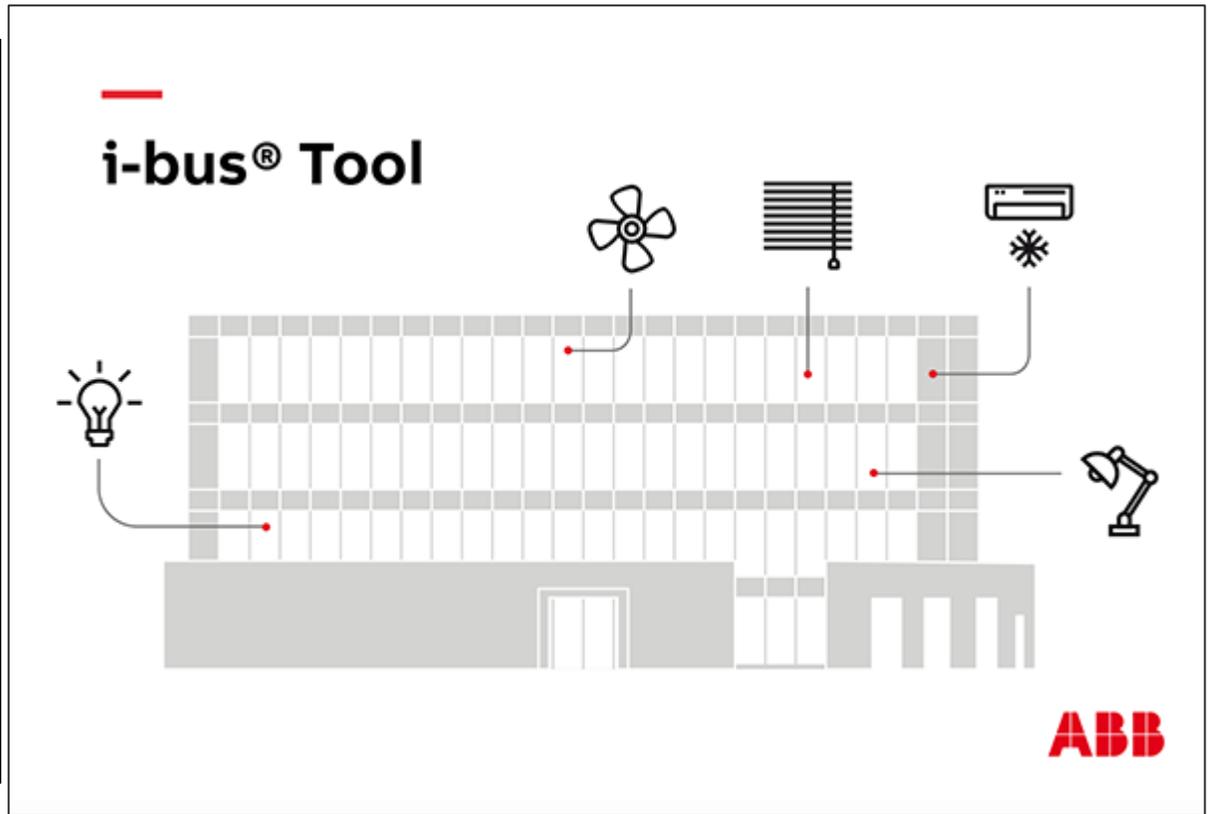
Switch/Shutter Actuator	Channels	Rated Current $I_N$ per Channel	Module Width (MW)	Group Adresses	Group Objects	Total Current per Device
SAH/S 8.6.7.1	8	6A	4	1000	282	8 x 6A
SAH/S 16.6.7.1	16	6A	8	1000	446	16 x 6A
SAH/S 24.6.7.1	24	6A	12	1000	610	24 x 6A
SAH/S 8.10.7.1	8	10A	4	1000	282	8 x 10A
SAH/S 16.10.7.1	16	10A	8	1000	446	16 x 10A
SAH/S 24.10.7.1	24	10A	12	1000	610	200A
SAH/S 8.16.7.1	8	16A	4	1000	282	100A
SAH/S 16.16.7.1	16	16A	8	1000	446	160A
SAH/S 24.16.7.1	24	16A	12	1000	610	200A

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# KNX Combi Switch Actuators SAH/S

ABB i-bus Tool

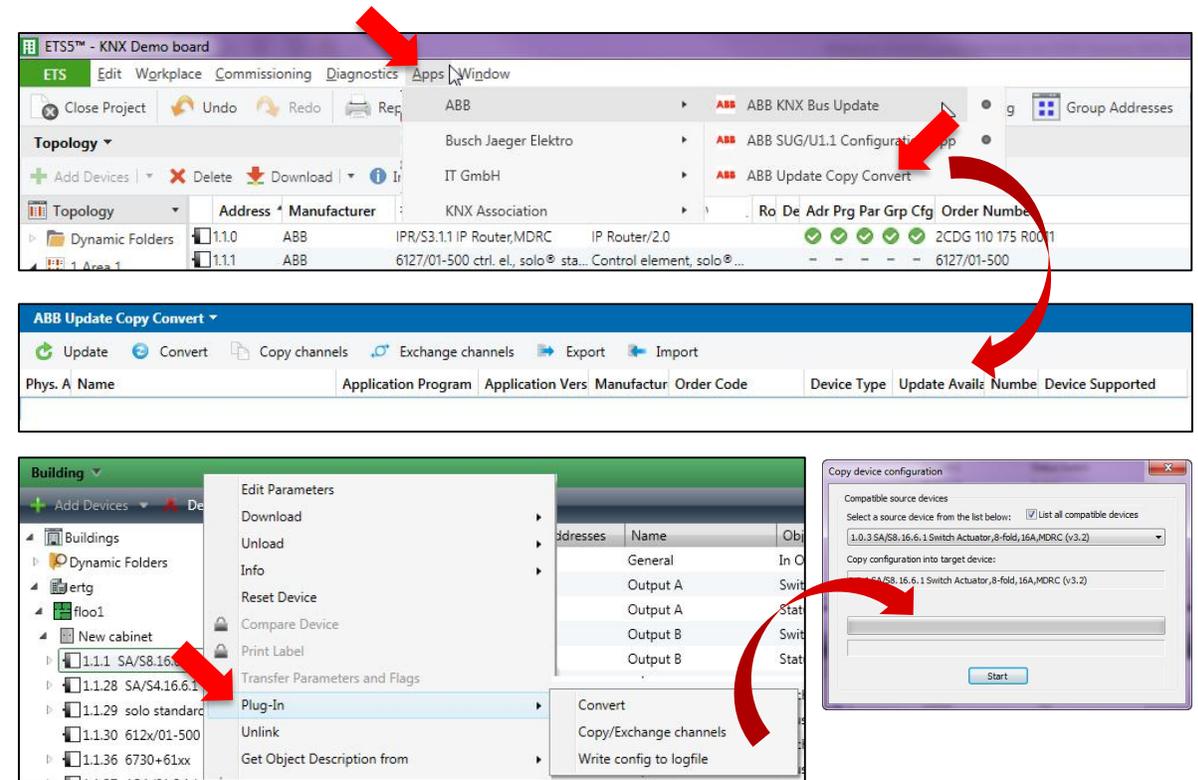
- All relevant ABB i-bus KNX Devices from the last years could be used together with ABB i-bus Tool
- the same will happen for the new generation of Switch Actuators
- Availability planned for 2020



# KNX Combi Switch Actuators SAH/S

## ABB ETS App: “Update Copy Convert”

- App with a series of useful functions, especially for
  - 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 Channels: Copies a channel configuration to other channels on a multichannel device
  - Exchange Channels : Exchanges configurations between two channels on a multichannel device
  - Import/Export: Saves and reads device configurations as external XML files
- Support of this App for Combi Switch Actuators with so many channels is very useful, it will be available soon, final test are running

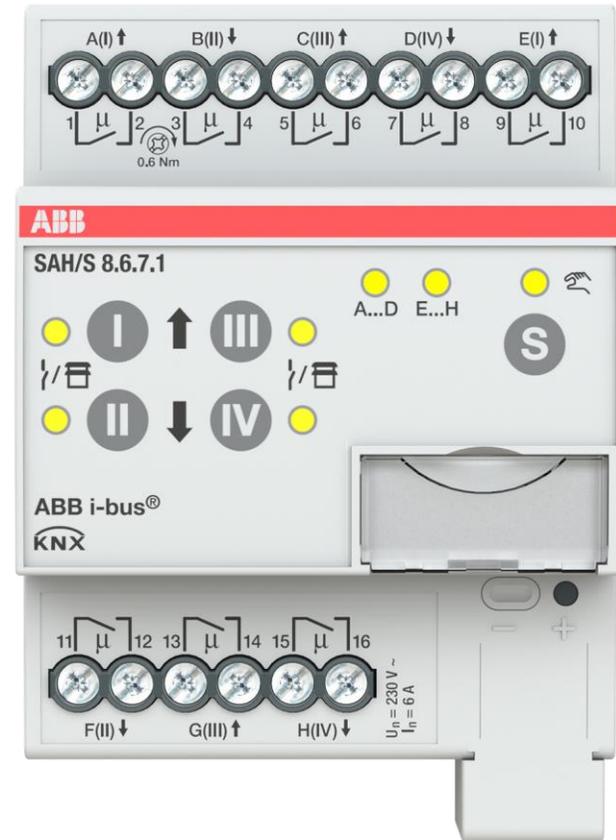


# KNX Combi Switch Actuators SAH/S

## Manual Operation

- Innovative Keypad for manual operation with reduced buttons and LED's for all combi switch actuators
- Activation via S-button, deactivation also via time
- Manual operation can be blocked via parameter in ETS application or telegram
- Selection of relay groups
- Selection of all relays for central off
- Blinking LED's indicate programming as shutter outputs

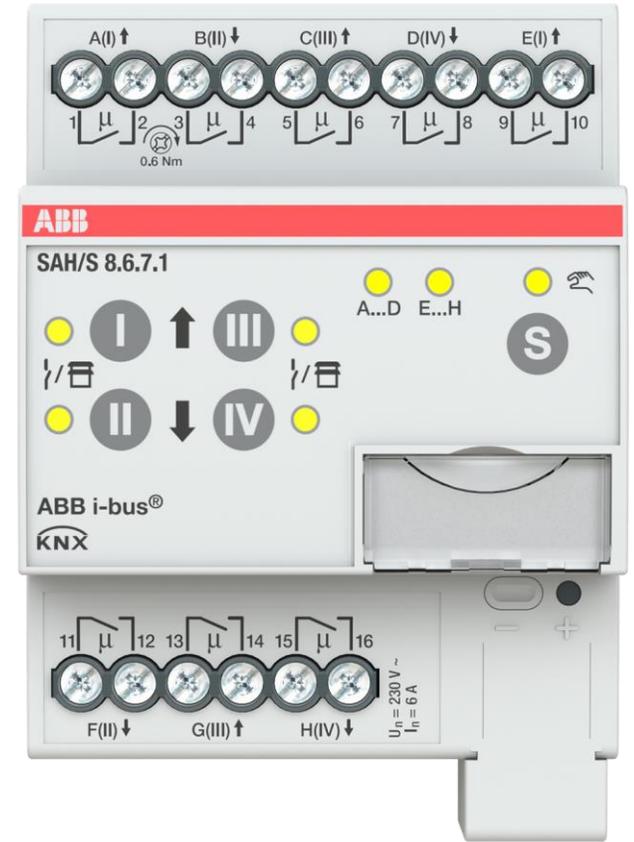
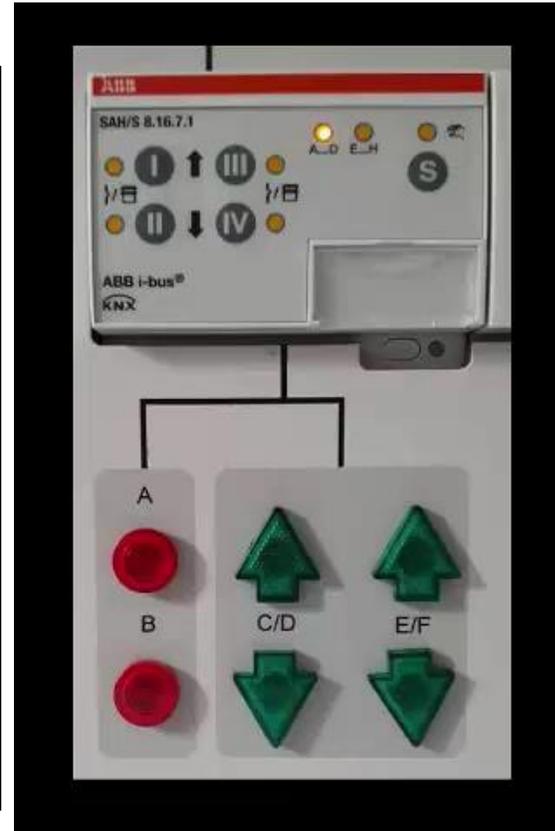
→ VIDEO



# KNX Combi Switch Actuators SAH/S

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# KNX Combi Switch Actuators SAH/S

Which answer is correct?

## Question 1

Which statements for KNX Combi Switch Actuator are correct?

- A SAH/S are prepared for future developments (Software functions, IoT services)
- B In build LED Touch Panel for manual operation
- C Reduced size, 2 channels per one module width

# KNX Combi Switch Actuators SAH/S

Which answer is correct?

## Question 1

Which statements for KNX Combi Switch Actuator SAH/S are correct?

- A SAH/S are prepared for future developments (Software functions, IoT services)
- B In build LED Touch Panel for manual operation
- C Reduced size, 2 channels per one module width

# KNX Combi Switch Actuators SAH/S

Which answer is correct?

## Question 2

What is true related to maximum number of channels and maximum current each relay?

**A** Up to 24 channels and 16 A AC1

**B** Up to 24 channels and 16 A AX

**C** Up to 16 channels and 16 A

# KNX Combi Switch Actuators SAH/S

Which answer is correct?

## Question 2

What is true related to maximum number of channels and maximum current each relay?

**A** Up to 24 channels and 16 A AC1

**B** Up to 24 channels and 16 A AX

**C** Up to 16 channels and 16 A

# KNX Combi Switch Actuators SAH/S

Which answer is correct?

## Question 3

What is right for the shutter functionality?

- A** Each relay output can control one shutter motor completely
- B** Outputs programmed as shutter can be identified by blinking LED's on the keypad
- C** All outputs must be either switch outputs or shutter outputs

# KNX Combi Switch Actuators SAH/S

Which answer is correct?

## Question 3

What is right for the shutter functionality?

- A Each relay output can control one shutter motor completely
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- C All outputs must be either switch outputs or shutter outputs

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# KNX Combi Switch Actuators SAH/S

ETS Application

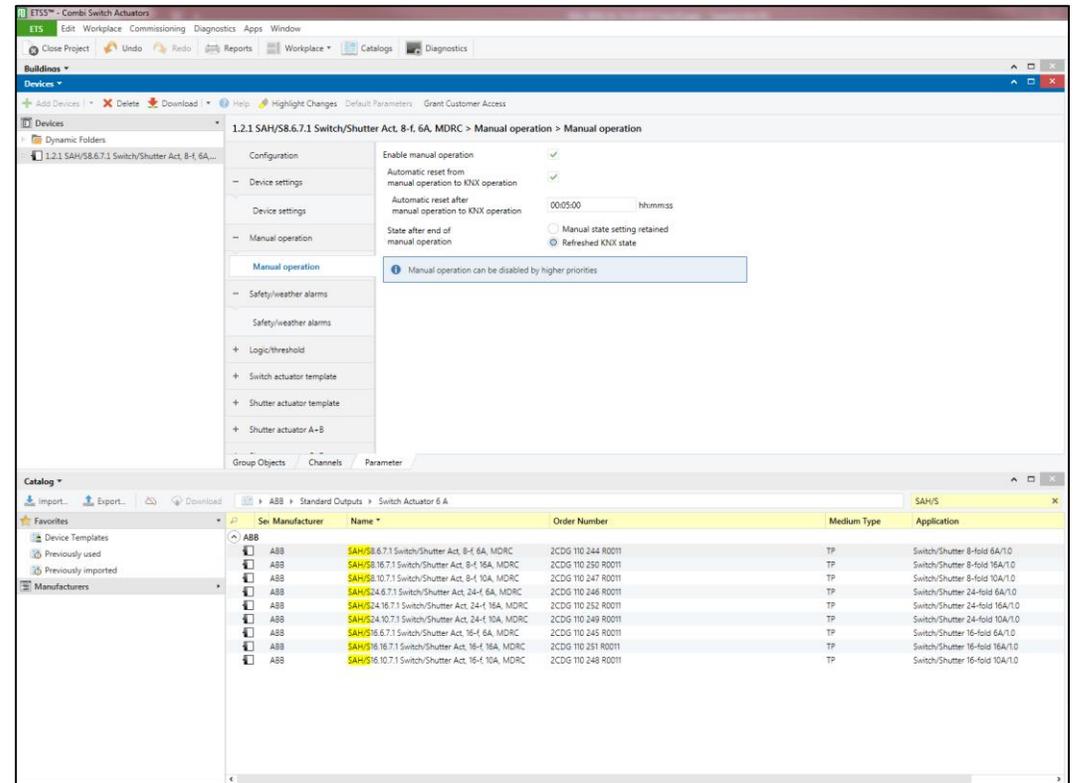
# KNX Combi Switch Actuators SAH/S

## ETS

### Overview

ETS Application with comprehensive functions but satisfying user experience

- Templates for switch- and shutter functions
- Freely programmable logic independent of the output channels (AND, OR, Exclusive OR, GATE) and threshold functions
- Full functionality of shutter outputs (Safety/Weather alarm, automatic sun protection, scenes, blocking, forced operation), but no travel time detection
- Switch outputs with time functions (Staircase, Delay, Flashing), safety, forced operation, blocking, 16 scenes (8 bit)
- Central objects (switching, shutter functions, scenes)
- Colored hints simplify work
- ETS5 required



# KNX Combi Switch Actuators SAH/S

## ETS

### Configuration

- Enabling of channels
- Enabling of logic and thresholds
  - 24 individual logic or threshold functions for each Combi Switch Actuator, independent of the outputs
- Telegram limitation

1.2.1 SAH/S8.16.7.1 Switch/Shutter Act, 8-f, 16A, MDRC > Configuration		
Configuration	Enable output A + B	<input checked="" type="checkbox"/>
- Device settings	Enable output C + D	<input checked="" type="checkbox"/>
	Enable output E + F	<input checked="" type="checkbox"/>
	Enable output G + H	<input checked="" type="checkbox"/>
	<hr/>	
+ Manual operation	Enable Logic/threshold 1-4	<input checked="" type="checkbox"/>
	Enable Logic/threshold 5-8	<input checked="" type="checkbox"/>
+ Safety/weather alarms	Enable Logic/threshold 9-12	<input type="checkbox"/>
+ Logic/threshold	Enable Logic/threshold 13-16	<input type="checkbox"/>
	Enable Logic/threshold 17-20	<input type="checkbox"/>
+ Switch actuator template	Enable Logic/threshold 21-24	<input type="checkbox"/>
+ Shutter actuator template	Maximum number of sent telegrams	<input type="text" value="20"/>
+ Switch actuator A	In period	<input type="text" value="01"/> ss

# KNX Combi Switch Actuators SAH/S

## ETS

### Device Settings

- Central Group Objects
  - to be used to switch several device outputs at the same time
  - Advantage: Less group address assignments, especially for multi channel devices
  - Available for switching, shutter control and scene
  - In the parameter block of each channel it can be decided whether the channel shall be part of the central function

1.2.1 SAH/S8.16.7.1 Switch/Shutter Act, 8-f, 16A, MDRC > Device settings > Device settings

Configuration	Sending and switching delay after bus voltage recovery	00:00:02	hh:mm:ss
– Device settings	State after sending and switching delay has elapsed	<input checked="" type="radio"/> Last value received	<input type="radio"/> Ignore received values
<b>Device settings</b>			
+ Manual operation	Enable group object "Request status values"	<input type="checkbox"/>	
+ Safety/weather alarms	Enable Central switch group object	<input checked="" type="checkbox"/>	
	Enable Central blind group objects	<input checked="" type="checkbox"/>	
	Enable Central scene group object	<input checked="" type="checkbox"/>	
– Logic/threshold	Enable group object "In operation"	No	
Logic/threshold 1			
Logic/threshold 2			

3	Switch	Central: Switch	1 bit
4	Move blind/shutter up-down	Central: Shutter	1 bit
5	Slat adjustment/stop up-down	Central: Shutter	1 bit
6	Move to position height	Central: Shutter	1 byte
7	Move to position slat	Central: Shutter	1 byte
8	Scenes 1...64	Central: Scene	1 byte

# KNX Combi Switch Actuators SAH/S

## ETS

### Manual Operation

- Functionality as known from other devices
  - can be reset after adjustable time
  - After end of manual operation also the actual and via KNX telegram changed status (Object End manual operation) can be shown
  - Objects for status, activation or deactivation of manual operation and to stop it any time but not to disable it

1.2.1 SAH/S8.16.7.1 Switch/Shutter Act, 8-f, 16A, MDRC > Manual operation > Manual operation

Configuration	Enable manual operation	<input checked="" type="checkbox"/>
+ Device settings	Automatic reset from manual operation to KNX operation	<input checked="" type="checkbox"/>
- Manual operation	Automatic reset after manual operation to KNX operation	<input type="text" value="00:05:00"/> hh:mm:ss
<b>Manual operation</b>	State after end of manual operation	<input type="radio"/> Manual state setting retained <input checked="" type="radio"/> Refreshed KNX state
+ Safety/weather alarms	<b>i</b> Manual operation can be disabled by higher priorities	

↔	12	Status Manual operation	Manual operation: Manual operation	1 bit
↔	13	Enable/disable manual operation	Manual operation: Manual operation	1 bit
↔	14	End manual operation	Manual operation: Manual operation	1 bit

# KNX Combi Switch Actuators SAH/S

## ETS

### Safety/weather alarms

- Distinction between switch and shutter functionality
- Switching
  - Safety priority 1, 2, 3
  - Monitoring of telegram possible with cyclical sending of safety signal
  - Application: In case of fire alarm all lights are to be turned on with highest priority, not possible to switch off locally
- Shutter
  - Wind alarm 1,2,3 / Rain / Frost
  - Priority of wind, rain and frost adjustable
  - Monitoring of sensor signals (standard due to security reasons) can be deactivated
- For both switching and shutter additionally forced operation and blocking at the dedicated parameter blocks available

1.2.1 SAH/S8.16.7.1 Switch/Shutter Act. 8-f, 16A, MDRC > Safety/weather alarms > Safety/weather alarms

Configuration	Read enabled safety group objects after bus voltage recovery and download <input checked="" type="checkbox"/>
+ Device settings	<p><b>i</b> The read flags must be set in the sending device!</p>
+ Manual operation	
- Safety/weather alarms	<b>Safety priority for switch actuator operation</b> <p><b>i</b> The reaction with safety priority active must be specified on the "Safety" parameter page for the switch actuator channels.</p>
<b>Safety/weather alarms</b>	
+ Logic/threshold	Enable group object "Safety priority 1" <input checked="" type="checkbox"/>
+ Switch actuator template	Cyclical monitoring interval (0 = cycl. monitoring deactivated) 00:00:00 h:mm:ss
+ Shutter actuator template	Enable group object "Safety priority 2" <input type="checkbox"/>
+ Shutter actuator A+B	Enable group object "Safety priority 3" <input type="checkbox"/>
+ Switch actuator C	
+ Switch actuator D	
+ Switch actuator E	
+ Switch actuator F	
+ Shutter actuator G+H	
	<b>Weather alarms for blind actuator operation</b> <p><b>i</b> The reaction with weather alarms active must be specified on the "Safety/weather alarms" parameter page for the blind channels.</p>
	Order of priority for weather alarms 1.Wind alarm - 2.Rain alarm - 3.Frost alarm
	Enable group object "Wind alarm 1" <input checked="" type="checkbox"/>
	Enable group object "Wind alarm 2" <input checked="" type="checkbox"/>
	Enable group object "Wind alarm 3" <input checked="" type="checkbox"/>
	Cyclical monitoring interval (0 = cycl. monitoring deactivated) 00:00:00 h:mm:ss
	Enable group object "Rain alarm" <input checked="" type="checkbox"/>
	Cyclical monitoring interval (0 = cycl. monitoring deactivated) 00:00:00 h:mm:ss
	Enable group object "Frost alarm" <input checked="" type="checkbox"/>
	Cyclical monitoring interval (0 = cycl. monitoring deactivated) 00:00:00 h:mm:ss

# KNX Combi Switch Actuators SAH/S

## ETS

### Logic/thresholds

- Parametrization of logic and thresholds
  - 24 individual logic or threshold functions for each Combi Switch Actuator, independent of the outputs
  - Assignment of logic also directly to switch or shutter outputs possible, with individual reactions on the result of the logic
  - Functions: AND,OR, Exclusive OR, GATE and Threshold
- AND/OR/Exclusive OR
  - Inversion of result
  - Send result to KNX: not needed if result is linked internally to a further logic
  - Defined status of inputs in case of bus voltage recovery, important for safe operation

1.2.1 SAH/S8.16.7.1 Switch/Shutter Act, 8-f, 16A, MDRC > Logic/threshold > Logic/threshold 1

Configuration	Function of the logic gate	AND
+ Device settings	Group object "Connection A" after bus voltage recovery	<input type="radio"/> 1 <input checked="" type="radio"/> 0
+ Manual operation	Group object "Connection B" after bus voltage recovery	<input type="radio"/> 1 <input checked="" type="radio"/> 0
+ Safety/weather alarms	Invert result	<input checked="" type="checkbox"/>
- Logic/threshold	Send result to KNX	<input checked="" type="checkbox"/>
	Send value of group object	After change or on request
Logic/threshold 1		
Logic/threshold 2		
Logic/threshold 3		
Logic/threshold 4		
Logic/threshold 5		
Logic/threshold 6		
Logic/threshold 7		
Logic/threshold 8		

# KNX Combi Switch Actuators SAH/S

## ETS

### Logic/thresholds

- GATE
  - To enable/disable telegrams at certain situations, e.g. a time program
  - Disabling with logical 1 or 0
  - Inversion of result
  - Send result to KNX: not needed if result is linked to a further logic
  - Defined status of inputs in case of bus voltage recovery, important for safe operation

1.2.1 SAH/S8.16.7.1 Switch/Shutter Act, 8-f, 16A, MDRC > Logic/threshold > Logic/threshold 1

Configuration	Function of the logic gate	GATE
+ Device settings	GATE disabled if group object "Connection A" same	<input checked="" type="radio"/> 1 <input type="radio"/> 0
+ Manual operation	Group object "Connection A" after bus voltage recovery	<input type="radio"/> 1 <input checked="" type="radio"/> 0
+ Safety/weather alarms	Group object "Connection B" after bus voltage recovery	<input type="radio"/> 1 <input checked="" type="radio"/> 0
- Logic/threshold	<b>i</b> Connection A = GATE, Connection B = input	
Logic/threshold 1	Invert result	<input checked="" type="checkbox"/>
Logic/threshold 2	Send result to KNX	<input checked="" type="checkbox"/>
Logic/threshold 3	Send value of group object	After change or on request

# KNX Combi Switch Actuators SAH/S

## ETS

### Logic/thresholds

#### – Threshold

- Different data point types for input selectable: Percent ( 1 byte), Meter pulses (1 byte or 2 byte), Temperature (2 byte floating), Lux (2 byte)
- Upper and lower threshold (Hysteresis)
- Thresholds changeable via KNX
- Results (1, 0, unchanged) for overshooting and undershooting the thresholds, but also for value between both thresholds
- Minimum time in all three situations adjustable, to hide short term and invalid situations
- Send result to KNX: not needed if result is linked to a further logic

1.2.1 SAH/S8.16.7.1 Switch/Shutter Act, 8-f, 16A, MDRC > Logic/threshold > Logic/threshold 1

Configuration	Function of the logic gate	Threshold
+ Device settings	Data type of group object "Threshold input"	Percent (DPT5.001)
+ Manual operation	<i>i</i> The value for the upper threshold must always be above the value for the lower threshold. If not, there will be a malfunction in the threshold evaluation.	
+ Safety/weather alarms	Upper threshold	50 %
– Logic/threshold	Lower threshold	20 %
	Change thresholds via KNX	<input type="checkbox"/>
<b>Logic/threshold 1</b>	Result if upper threshold is exceeded	1
Logic/threshold 2	Min. duration of the overshoot	00:00:00 hh:mm:ss
Logic/threshold 3	Result if the input value is between the thresholds	Unchanged
Logic/threshold 4	Minimum dwell time between the thresholds	00:00:00 hh:mm:ss
Logic/threshold 5	Result if lower threshold is dropped below	0
Logic/threshold 6	Min. duration of the undershoot	00:00:00 hh:mm:ss
Logic/threshold 7	Update result after each overshoot/undershoot	<input checked="" type="checkbox"/>
Logic/threshold 8	Send result to KNX	<input checked="" type="checkbox"/>
+ Switch actuator template	Send value of group object	After change or on request
+ Shutter actuator template		
+ Shutter actuator A+B		
+ Switch actuator C		

# KNX Combi Switch Actuators SAH/S

## ETS

### Templates

- Templates allow to parametrize a certain number of functions to be assigned to individual channels
  - Available for switch or shutter outputs
  - Split into different parts (parameter blocks)
  - For each output and parameter block the templates can be used or individual adjustment can be done
- Advantage: Save of time and work during parametrization as typically channels need the same adjustments

1.2.1 SAH/S8.16.7.1 Switch/Shutter Act, 8-f, 16A, MDRC > Switch actuator template > Basic settings

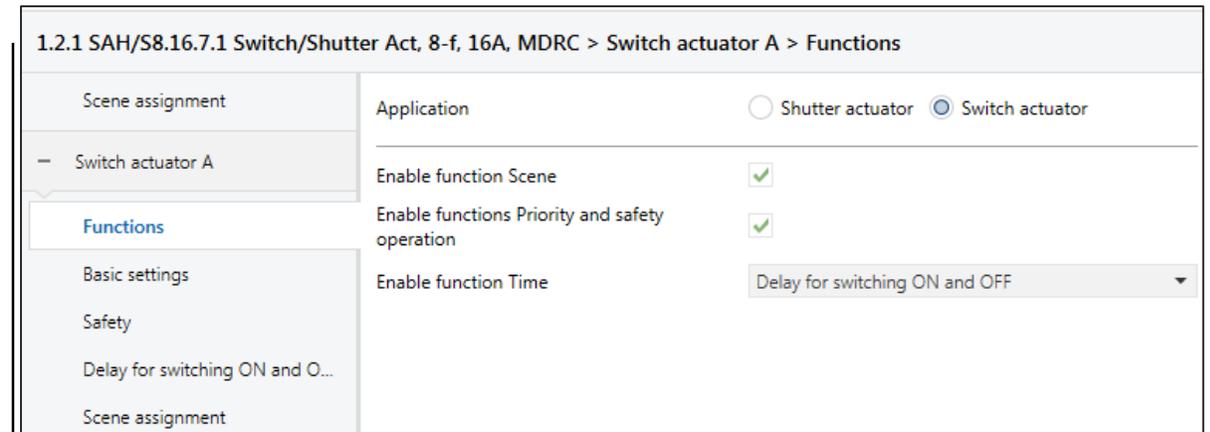
– Switch actuator template	Reaction of output	<input type="radio"/> N/C <input checked="" type="radio"/> N/O
Basic settings	Switch output reacts to Central switch group object	<input checked="" type="checkbox"/>
Safety	Output reacts to	No Logic/threshold function
Delay for switching ON and O...	<b>Enable the function Logic/threshold on the Logic/Threshold page.</b>	
Staircase lighting	Feedback of contact position via group object "Status switch"	<input checked="" type="checkbox"/>
Flashing	Value of group object "Status switch"	<input checked="" type="radio"/> 1: closed, 0: opened <input type="radio"/> 0: closed, 1: opened
Scene assignment	Send value of group object	After change or on request
– Shutter actuator template	Enable group object "Status information"	<input checked="" type="checkbox"/>
Basic settings	Send value of group object	After change or on request
Drive	Reaction on bus voltage failure	Contact open
Blind/shutter	Reaction after bus voltage recovery	Do not write group object "Switch"
Safety/weather	Reaction after ETS download	Do not write group object "Switch"
Automatic sun protection		

# KNX Combi Switch Actuators SAH/S

## ETS

### Switch Actuator – Function

- Selection of actuator type (switching or shutter)
- Please note: Default parametrization is shutter! Why?
  - Inverse default parametrization (switching) can destroy a motor as the two related output can be closed at the same time!
  - For switch functionality the parameter has to be changed
- In case of switch actuator selection the second output of a pair (e.g. A/B or C/D) can be an actuator as well or inactive
  - Enable scene, priority/safety functions and time functions (staircase, on/off delay, flashing)



# KNX Combi Switch Actuators SAH/S

## ETS

### Switch Actuator – Basic settings

- Available for individual configuration or template
- Normally open or closed contact
- Reaction to central object to create individual ‘central’ function
- Reaction on logic/threshold function
  - Though logic is independent of any output, it can be directly assigned to the channel
- Status feedback (on/off) via separate group object
- Status information 1 byte, e.g. forced/manual operation or time function active
- Reaction on bus voltage failure and recovery or after ETS download

The screenshot displays the 'Basic settings' page for a switch actuator in the ETS software. The interface is divided into a left-hand navigation pane and a main configuration area. The navigation pane lists various actuator types and their settings, with 'Switch actuator A' selected. The main area shows the following settings:

- Parameter setting:** Radio buttons for 'Apply from template' (unselected) and 'Individual' (selected).
- Reaction of output:** Radio buttons for 'N/C' (unselected) and 'N/O' (selected).
- Switch output reacts to Central switch group object:** A checked checkbox.
- Output reacts to:** A dropdown menu set to 'Logic/threshold 1'.
- Reaction on result "0":** A dropdown menu set to 'OFF'.
- Reaction on result "1":** A dropdown menu set to 'ON'.
- Feedback of contact position via group object "Status switch":** A checked checkbox.
- Value of group object "Status switch":** Radio buttons for '1: closed, 0: opened' (selected) and '0: closed, 1: opened' (unselected).
- Send value of group object:** A dropdown menu set to 'After change or on request'.
- Enable group object "Status information":** A checked checkbox.
- Send value of group object:** A dropdown menu set to 'After change or on request'.
- Reaction on bus voltage failure:** A dropdown menu set to 'Contact open'.
- Reaction after bus voltage recovery:** A dropdown menu set to 'Do not write group object "Switch"'. A blue information banner above this section reads: 'Enable the function Logic/threshold on the Logic/Threshold page.'
- Reaction after ETS download:** A dropdown menu set to 'Do not write group object "Switch"'. A blue information banner above this section reads: 'Enable the function Logic/threshold on the Logic/Threshold page.'

# KNX Combi Switch Actuators SAH/S

## ETS

### Switch Actuator – Safety

- Available for individual configuration or template
- Reaction on safety functions, forced operation or blocking
  - On/off/unchanged/no reaction
- Switching Status on reset of these functions
  - On/off/refreshed KNX state/no reaction
  - Refreshed KNX state (any background function during safety/forced operation/blocking will be carried out)
- Further adjustments at parameter block Safety/weather alarm

1.2.1 SAH/S8.16.7.1 Switch/Shutter Act, 8-f, 16A, MDRC > Switch actuator A > Safety

– Switch actuator A

Parameter setting  Apply from template  Individual

Functions

Basic settings

**Safety**

Delay for switching ON and O...

Scene assignment

+ Switch actuator B

– Shutter actuator C+D

Functions

Basic settings

Drive

**i** The objects "Safety priority 1-3" are enabled on the Safety/weather alarms page. The order specifies the priority of the safety functions.

Switching status for safety priority 1 No reaction/deactivated

Forced operation (1 bit/2 bit) Deactivated

Switching status for safety priority 2 No reaction/deactivated

Switching status for safety priority 3 No reaction/deactivated

Block No reaction/deactivated

Switching status on reset of blocking, forced operation and safety priority No reaction

# KNX Combi Switch Actuators SAH/S

## ETS

### Switch Actuator – Staircase lighting

- Available for individual configuration or template
- Visible if this time function is enabled at parameter block Functions
- Staircase lighting can be started again or extended to up to 5 x staircase time by pressing the local push button up to 5 times
- Staircase lighting switchable, e.g. to be turned off during an event (permanent on)
- Warning before switching off the staircase lighting: Either via telegram or quick switching off/on of the light
  - Switching off/on up to 5 times and warning time adjustable
- Staircase lighting can be enabled/disabled via group object
- Staircase time changeable via group object
- Restart staircase lighting after end of permanent on
- Timeline: Staircase time – warning – warning time – end (off)

1.2.1 SAH/S8.16.7.1 Switch/Shutter Act, 8-f, 16A, MDRC > Switch actuator C > Staircase lighting

Logic/threshold 4	Parameter setting	<input type="radio"/> Apply from template <input checked="" type="radio"/> Individual
Logic/threshold 5	Staircase lighting time	<input type="text" value="00:05:00"/> hh:mm:ss
Logic/threshold 6	Staircase lighting can be started again	<input checked="" type="checkbox"/>
Logic/threshold 7	Staircase lighting time extendable (pumps)	Up to max. 2x staircase lighting time
Logic/threshold 8	Staircase lighting switchable	ON with "1" and OFF with "0"
– Switch actuator template	Warning before switching off the staircase lighting	Via object and quick switching ON/OFF
Basic settings	Quantity of Off/On changes	<input type="text" value="2"/>
Safety	Warning time	<input type="text" value="00:00:45"/> hh:mm:ss
Delay for switching ON and O...	Disable staircase lighting via group object	<input checked="" type="checkbox"/>
Staircase lighting	Disable staircase lighting after bus voltage recovery	<input checked="" type="checkbox"/>
Flashing	Change staircase lighting time via group object	<input checked="" type="checkbox"/>
Scene assignment	Restart staircase lighting after end of permanent ON	<input checked="" type="checkbox"/>
+ Shutter actuator template		

# KNX Combi Switch Actuators SAH/S

## ETS

### Switch Actuator – Delay for switching ON and OFF

- Available for individual configuration or template
- Visible if this time function is enabled at parameter block Functions
- Time for delay on or delay off
- Can be enabled/disabled via group object

1.2.1 SAH/S8.16.7.1 Switch/Shutter Act, 8-f, 16A, MDRC > Switch actuator A > Delay for switching ON and OFF

– Switch actuator A	Parameter setting	<input type="radio"/> Apply from template	<input checked="" type="radio"/> Individual
Functions	Delay for switching ON	<input type="text" value="00:00:10"/>	hh:mm:ss
Basic settings	Delay for switching OFF	<input type="text" value="00:00:20"/>	hh:mm:ss
Safety	Disable delay for switching ON and OFF via group object	<input checked="" type="checkbox"/>	
Delay for switching ON and OFF	After bus voltage recovery disable delay for switching ON and OFF	<input checked="" type="checkbox"/>	
Scene assignment			

# KNX Combi Switch Actuators SAH/S

## ETS

### Switch Actuator – Flashing

- Available for individual configuration or template
- Visible if this time function is enabled at parameter block Functions
- Activation with value 0 or 1 or both
- Time for on and off
- Number of flash cycles up to 100
- After flashing relay on or off or refreshed KNX state (any background functions during flashing will be carried out)

1.2.1 SAH/S8.16.7.1 Switch/Shutter Act, 8-f, 16A, MDRC > Switch actuator C > Flashing

Configuration	Parameter setting	<input type="radio"/> Apply from template <input checked="" type="radio"/> Individual
+ Device settings	Flashing if group object Flashing same	ON (1) or OFF (0)
+ Manual operation	Time for ON	00:00:05 hh:mm:ss
+ Safety/weather alarms	Time for OFF	00:00:05 hh:mm:ss
+ Logic/threshold	Number of flash cycles	5
+ Switch actuator template	Contact position after flashing	Refreshed KNX state
+ Shutter actuator template	<p><b>i</b> Observe the contact life and switching cycles per minute. For more information, see product manual.</p>	
+ Shutter actuator A+B		
- Switch actuator C		
Functions		
Basic settings		
Safety		
Flashing		

# KNX Combi Switch Actuators SAH/S

## ETS

### Switch Actuator – Scene assignment

- Available for individual configuration or template
- Activation for of up to 16 scenes 1 byte
- Recall and storage of scenes via 1 byte object
- Scene recall also via group object 1 bit (for scene 1 ... 4)
  - Additional object to activate the scene (similar to 1 bit preset, e.g. UD/S 2.300.2)
  - Advantage: 1 bit is easier to handle for some sensors than 1 byte
- Free allocation of the 16 scenes to scene number 1 ... 64
- Delay time until scene is active (up to 12 hours)

1.2.1 SAH/S8.16.7.1 Switch/Shutter Act, 8-f, 16A, MDRC > Switch actuator A > Scene assignment

Parameter setting  Apply from template  Individual

Overwrite scenes on download

Enable scene assignment 1

Scene recall also via group object

Scene number 1

Delay 00:00:00 hh:mm:ss

**i** If delay not equal to 0, there is no staircase lighting and no switching ON and OFF delay.

Action for scene  ON  OFF

Enable scene assignment 2

130 Recall scene assignment 1 Channel A: Switch 1 bit

# KNX Combi Switch Actuators SAH/S

## ETS

### Shutter Actuator – common parameters

- Selection of actuator type (switching or shutter)
- With selection shutter the second output of a pair (e.g. A/B or C/D) belongs automatically to the shutter channel
  - Selection with or without slat adjustment
  - Enable scene, priority/safety functions and automatic sun protection

1.2.1 SAH/S8.16.7.1 Switch/Shutter Act, 8-f, 16A, MDRC > Shutter actuator A+B > Common parameter

Configuration	Application <input checked="" type="radio"/> Shutter actuator <input type="radio"/> Switch actuator
+ Device settings	Operating type <input checked="" type="radio"/> Blind/shutter control with slat adjustment <input type="radio"/> Blind/shutter control without slat adjustment
+ Manual operation	<b>i</b> To control venetian or vertical blinds and other shading systems with slats
+ Safety/weather alarms	Enable function Scene <input type="checkbox"/>
+ Logic/threshold	Enable function Priority and safety operation/weather alarms <input type="checkbox"/>
+ Switch actuator template	Enable function Automatic sun protection <input type="checkbox"/>
+ Shutter actuator template	
– Shutter actuator A+B	
<b>Common parameter</b>	
Basic settings	
Drive	
Blind/shutter	
Status messages	

# KNX Combi Switch Actuators SAH/S

## ETS

### Shutter Actuator – Basic settings

- Available for individual configuration or template
- Reaction to central object to create individual ‘central’ function
- Reaction on logic/threshold function
  - No reaction, up, down, stop, scene, individual position
  - Though logic is independent of any output, it can be directly assigned
- Reaction on bus voltage failure and recovery or after ETS download

1.2.1 SAH/S8.16.7.1 Switch/Shutter Act, 8-f, 16A, MDRC > Shutter actuator A+B > Basic settings

+ Manual operation	Parameter setting	<input type="radio"/> Apply from template <input checked="" type="radio"/> Individual
+ Safety/weather alarms	Output reacts to central blind group objects	<input checked="" type="checkbox"/>
+ Logic/threshold	Output reacts to	Logic/threshold 1
+ Switch actuator template	Reaction on result "0"	No reaction
+ Shutter actuator template	Reaction on result "1"	No reaction
- Shutter actuator A+B	<b>i</b> Enable the function Logic/threshold on the Logic/Threshold page.	
Common parameter	Reaction on bus voltage failure	Stop
Basic settings	Reaction after bus voltage recovery	Stop
Drive	Reaction after ETS download	Stop
Blind/shutter		

# KNX Combi Switch Actuators SAH/S

## ETS

### Shutter Actuator – Drive

- Available for individual configuration or template
- Travel time separate for up and down, needed for good positioning
  - Please note: no automatic travel time detection via current measurement available
- Disconnect output power after end position + x% overflow
  - Additional safety with power turn off in case of malfunction of end switch
- Object “Trigger Reference Movement”
  - Runs drive to end position (value 1 = lower end position, value 0 upper end position)
  - Improvement of positioning when driving the hanging not to end positions during normal operation
  - Position after reference movement adjustable

1.2.1 SAH/S8.16.7.1 Switch/Shutter Act, 8-f, 16A, MDRC > Shutter actuator A+B > Drive

+ Manual operation	Parameter setting	<input type="radio"/> Apply from template <input checked="" type="radio"/> Individual
+ Safety/weather alarms	Travel time up	00:01:00 hh:mm:ss
+ Logic/threshold	Travel time down	00:01:00 hh:mm:ss
+ Switch actuator template	Disconnect output from power after	End position + 10% overflow
+ Shutter actuator template	Enable group object "Trigger reference movement"	<input checked="" type="checkbox"/>
- Shutter actuator A+B	Position after reference movement	<input checked="" type="radio"/> No reaction, remain in reference position <input type="radio"/> Move to position before reference movement
Common parameter	Reversing time	500 ms
Basic settings	<b>i</b> Pay attention to technical data for the drive! At bus voltage failure the reversing time is always 1 second.	
Drive	Delay time for drive	<input type="radio"/> Default <input checked="" type="radio"/> Custom
Blind/shutter	Start-up delay	0 ms
Safety/weather	Coasting delay	0 ms
Automatic sun protection	Minimum run time for drive	50 ms
Status messages		

# KNX Combi Switch Actuators SAH/S

## ETS

### Shutter Actuator – Drive

- Available for individual configuration or template
- Reversing time: Time the drive stops when the direction of the hanging will be reversed
  - Please note: important value to protect the drive, see manual or recommendation of drive manufacturer
- Delay time of drive
  - Some drives attain their full power only after a start-up delay of a few milliseconds or continue moving for a few milliseconds after switch-off (coasting delay). It might be necessary to compensate delay times during start-up and coasting of the drive, e.g. to position the blinds/shutters exactly
- Minimum run time for drive
  - Too short minimum run time can damage the connected drive. Pay attention to technical data for the connected drive

1.2.1 SAH/S8.16.7.1 Switch/Shutter Act, 8-f, 16A, MDRC > Shutter actuator A+B > Drive

+ Manual operation	Parameter setting	<input type="radio"/> Apply from template <input checked="" type="radio"/> Individual
+ Safety/weather alarms	Travel time up	00:01:00 hh:mm:ss
+ Logic/threshold	Travel time down	00:01:00 hh:mm:ss
+ Switch actuator template	Disconnect output from power after	End position + 10% overflow
+ Shutter actuator template	Enable group object "Trigger reference movement"	<input checked="" type="checkbox"/>
- Shutter actuator A+B	Position after reference movement	<input checked="" type="radio"/> No reaction, remain in reference position <input type="radio"/> Move to position before reference movement
Common parameter	Reversing time	500 ms
Basic settings	<i>Pay attention to technical data for the drive! At bus voltage failure the reversing time is always 1 second.</i>	
Drive	Delay time for drive	<input type="radio"/> Default <input checked="" type="radio"/> Custom
Blind/shutter	Start-up delay	0 ms
Safety/weather	Coasting delay	0 ms
Automatic sun protection	Minimum run time for drive	50 ms
Status messages		

# KNX Combi Switch Actuators SAH/S

## ETS

### Shutter Actuator – Blind/Shutter

- Available for individual configuration or template
- Move to position
  - Direct, indirectly via upper or lower end position or shortest way
- Slat adjustment
  - Via duration of slat adjustment:  
After adjustment of duration the number of steps from open to close has to be tested and typed in the parameter
  - Via total duration: Time has to be obtained from manufacturer of the drive to adjust the required number of steps
- Limit step commands to the number of adjusted steps avoids further movement of hanging in case of slate operation
- Total turning of slats after move down (Function closed-open-closed) to release slats which got stuck
- Position of slats at lower end position

1.2.1 SAH/S8.16.7.1 Switch/Shutter Act, 8-f, 16A, MDRC > Shutter actuator A+B > Blind/shutter

Configuration	Parameter setting	<input type="radio"/> Apply from template <input checked="" type="radio"/> Individual
+ Device settings	Move to position	Direct
+ Manual operation	Enable group objects "Move to pos. height/Move to pos. slat"	<input checked="" type="checkbox"/>
+ Safety/weather alarms	Determine slat adjustment time	<input type="radio"/> Via duration of slat adjustment (step) <input checked="" type="radio"/> Via total duration for slat turning
+ Logic/threshold	Total duration to turn slat from 0% - 100%	1500 ms
+ Switch actuator template	Number of slat adjustments (from 0% = open to 100% = closed)	7
+ Shutter actuator template	<b>i</b> Quotient of slat adjustment time and number of slat adj.: >= 50 ms!	
- Shutter actuator A+B	Limit step commands to number of slat adjustments	<input checked="" type="checkbox"/>
Common parameter	Total turning of slats after move down	<input checked="" type="checkbox"/>
Basic settings	Position of slat after arriving at the lower end position (100% = deactivated)	100 %
Drive		
<b>Blind/shutter</b>		

# KNX Combi Switch Actuators SAH/S

## ETS

### Shutter Actuator – Blind/Shutter

- Travelling range limitation upper/lower limit depending on function (automatic sun protection and direct commands)
- Dead times
  - Defines times where the hanging is not moving though motor is turning (mechanical slippage)
  - Consideration enables precise positioning
  - In projects to be tested with different times

Blind/shutter	
Safety/weather	
Automatic sun protection	
Status messages	
Scene assignments	
+ Switch actuator C	
+ Switch actuator D	
+ Switch actuator E	
+ Switch actuator F	
+ Shutter actuator G+H	
Limit traveling range via group object	Enable limitation <input type="checkbox"/>
Upper limit (0% = top; 100% = bottom)	<input type="text" value="0"/> %
Lower limit (0% = top; 100% = bottom)	<input type="text" value="100"/> %
Upper limit valid for automatic sun protection commands	<input checked="" type="checkbox"/>
Upper limit valid for direct commands	<input checked="" type="checkbox"/>
Lower limit valid for automatic sun protection commands	<input checked="" type="checkbox"/>
Lower limit valid for direct commands	<input checked="" type="checkbox"/>
Set dead times	<input type="radio"/> Default <input checked="" type="radio"/> Custom
Dead time blind/shutter from bottom until moving up	<input type="text" value="0"/> ms
Dead time of slat from 100% closed until slat turn	<input type="text" value="0"/> ms
Slippage of slat on change of direction	<input type="text" value="0"/> ms

# KNX Combi Switch Actuators SAH/S

## ETS

### Shutter Actuator – Safety/weather

- Available for individual configuration or template
- Reaction of the drive on different safety or weather conditions
  - No reaction, up, down, stop, unchanged, scene, individual position
  - Up to 3 wind sensors can be assigned  
Application: Complex building structure with different wind situation at the facades
  - Rain and frost alarm sensors can be assigned  
Application: Closing of windows in case of rain, retract frost sensitive hanging
  - Blocking function via 1 bit telegram with position for height and slat  
Application: Cleaning of window with shutter up and blocked

1.2.1 SAH/S8.16.7.1 Switch/Shutter Act, 8-f, 16A, MDRC > Shutter actuator A+B > Safety/weather

Configuration	Parameter setting <input type="radio"/> Apply from template <input checked="" type="radio"/> Individual
+ Device settings	<div style="border: 1px solid #00a0e3; padding: 5px;"><b>i</b> Wind, rain, and frost alarm are active if objects on page "Safety/weather alarms" are enabled and linked with group addresses</div>
+ Manual operation	
+ Safety/weather alarms	Output reacts to wind alarm 1 <input checked="" type="checkbox"/>
+ Logic/threshold	Output reacts to wind alarm 2 <input checked="" type="checkbox"/>
+ Switch actuator template	Output reacts to wind alarm 3 <input checked="" type="checkbox"/>
+ Shutter actuator template	Position for wind alarm <input type="text" value="No reaction/deactivated"/>
- Shutter actuator A+B	Position for rain alarm <input type="text" value="Down"/>
Common parameter	Position for frost alarm <input type="text" value="No reaction/deactivated"/>
Basic settings	Position for blocking <input type="text" value="Individual position"/>
Drive	Position height (0% = top; 100% = bottom) <input type="text" value="50"/> %
Blind/shutter	Position slat (0% = open; 100% = closed) <input type="text" value="0"/> %
<b>Safety/weather</b>	

# KNX Combi Switch Actuators SAH/S

## ETS

### Shutter Actuator – Safety/weather

- Forced operation via 1 or 2 bit
- 1 bit
  - Activation with value 0 **or** 1
  - Position of height and slat
- 2 bit
  - 2 different positions for height and slat possible
  - Activation with value 3 (active on) **and** 2 (active off)
  - Deactivation with value 0 or 1

0 | 0 = forced operation inactive (value 0 decimal)

0 | 1 = forced operation inactive (value 1 decimal)

1 | 0 = forced operation active, Off state (value 2 decimal)

1 | 1 = forced operation active, On state (value 3 decimal)

Common parameter	Forced operation (1 bit/2 bit)	Activated 1 bit - 1 active
Basic settings	Position height (0% = top; 100% = bottom)	50 %
Drive	Position slat (0% = open; 100% = closed)	100 %
Blind/shutter		
Safety/weather	Position for reset of weather alarm, blocking and forced operation	No reaction
Automatic sun protection		

Safety/weather	Forced operation (1 bit/2 bit)	Activated 2 bit
Automatic sun protection	Forced operation active ON	
Status messages	Position height (0% = top; 100% = bottom)	0 %
Scene assignments	Position slat (0% = open; 100% = closed)	0 %
+ Switch actuator C	Forced operation active OFF	
+ Switch actuator D	Position height (0% = top; 100% = bottom)	0 %
+ Switch actuator E	Position slat (0% = open; 100% = closed)	0 %

# KNX Combi Switch Actuators SAH/S

## ETS

### Shutter Actuator – Safety/weather

- Position for reset of weather alarm, blocking and forced operation
  - No reaction, up, down, stop, unchanged, scene, individual position, refreshed KNX state (any background functions during safety/weather functions will be carried out)
- Automatic sun protection on reset of weather alarms, blocking and forced operation
- Priority sequence of safety/weather alarms
  - Note: Priority sequence of weather alarms (wind, rain, frost) to be adjusted under parameter block Safety/weather alarms

The screenshot shows the ETS software interface for a Shutter Actuator's Safety/weather settings. The left sidebar contains a navigation menu with the following items: basic settings, Drive, Blind/shutter, Safety/weather (highlighted), Automatic sun protection, Status messages, Scene assignments, + Switch actuator C, + Switch actuator D, + Switch actuator E, and + Switch actuator F. The main content area is divided into two sections. The top section is titled 'Position for reset of weather alarm, blocking and forced operation' and features a dropdown menu set to 'No reaction'. Below this is a blue information box with an 'i' icon and the text: 'Position will only be moved to with deactivated autom. sun protection'. The bottom section is titled 'Automatic sun protection on reset of weather alarms, blocking and forced operation' and has a green checkmark icon. Below this is another section titled 'Priority sequence of weather alarm, blocking and forced operation' with a dropdown menu. The dropdown menu is open, showing a list of priority sequences. The selected sequence is '1.Weather alarm - 2.Block - 3.Forced operation', which has a green checkmark next to it. Other visible sequences include '1.Weather alarm - 2.Forced operation - 3.Block', '1.Block - 2.Weather alarm - 3.Forced operation', '1.Block - 2.Forced operation - 3.Weather alarm', and '1.Forced operation - 2.Weather alarm - 3.Block'.

# KNX Combi Switch Actuators SAH/S

## ETS

### Shutter Actuator – Automatic sun protection

- Automatic sun protection runs the drive depending on over/undershooting of a brightness level. Information is received from outdoor brightness sensor or weather station as a 1 bit telegram
- Deactivation of automatic sun protection via group object or direct operation (e.g. local push button in the room)
  - Reactivation after certain time possible
- Both automatic sun protection and direct operation can be blocked via group objects
- Position of shutter in the event of over/undershooting adjustable, also with delay
  - No reaction, up, down, stop, unchanged, scene, individual pos.
  - Receive height and/or slat via group object ( 1 byte) allows integration of shutter control unit JSB/S 1.1 for control of blinds depending on sun position

1.2.1 SAH/S8.16.7.1 Switch/Shutter Act, 8-f, 16A, MDRC > Shutter actuator A+B > Automatic sun protection

Configuration	Parameter setting <input type="radio"/> Apply from template <input checked="" type="radio"/> Individual
+ Device settings	Deactivation of the automatic sun protection <input type="radio"/> Via group object <input checked="" type="radio"/> Via group object and direct command
+ Manual operation	Automatic reactivation of automatic sun protection <input checked="" type="checkbox"/>
+ Safety/weather alarms	Time for automatic reactivation of automatic sun protection <input type="text" value="05:00:00"/> hh:mm:ss
+ Logic/threshold	Enable group object "Block automatic sun protection" <input checked="" type="checkbox"/>
+ Switch actuator template	Enable group object "Block direct operation" <input checked="" type="checkbox"/>
+ Shutter actuator template	
- Shutter actuator A+B	Position for sun = 1 (sun) <input type="text" value="Receive height and slat via group object"/>
Common parameter	Delay for sun = 1 <input type="text" value="00:00:00"/> hh:mm:ss
Basic settings	Position for sun = 0 (no sun) <input type="text" value="Open"/>
Drive	Delay for sun = 0 <input type="text" value="00:00:00"/> hh:mm:ss
Blind/shutter	
Safety/weather	Read activated automatic sun protection group objects after bus voltage recovery and download <input checked="" type="checkbox"/>
Automatic sun protection	
Status messages	<b>i</b> Read flags must be set at sending device

# KNX Combi Switch Actuators SAH/S

## ETS

### Shutter Actuator – Status messages

- Group objects for following status messages:
  - Height/Slats (1 byte)
  - Upper/Lower end position (1 bit)
  - Operability (1 bit)  
Application: LED on local push button shows operability, operation e.g. not possible due to safety functions (wind) or manual operation
  - Automatic sun protection active (1 bit)
  - Information (1 byte, e.g. safety, - time,- or manual operation active)

1.2.1 SAH/S8.16.7.1 Switch/Shutter Act, 8-f, 16A, MDRC > Shutter actuator A+B > Status messages

Parameter setting	Apply from template	Individual
Enable group objects "Status Height/Slat"	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Send value of group object	After change or on request	
Enable group objects "Status Upper/Lower end pos."	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Send value of group object	After change or on request	
Enable group object "Status Operability"	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Send value of group object	After change or on request	
Enable group object "Status Automatic sun protection"	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Send value of group object	After change or on request	
Enable group object "Status information"	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Send value of group object	After change or on request	

# KNX Combi Switch Actuators SAH/S

## ETS

### Shutter Actuator – Status messages

- Parameter options:
  - No, update only (value in group object will be updated but not sent on the bus. Possible to achieve via read request, e.g. visualization)
  - After change (value has to be different to be sent on the bus)
  - On request (A request can be triggered by sending the value 0 or 1 on the group object Request status values)
  - After change and on request

The screenshot displays the configuration window for a shutter actuator in the ETS software. The path is: 1.2.1 SAH/S8.16.7.1 Switch/Shutter Act, 8-f, 16A, MDRC > Shutter actuator A+B > Status messages. The interface is divided into a left sidebar with a tree view and a main configuration area. The tree view shows a hierarchy: Switch actuator template, Shutter actuator template, Shutter actuator A+B (expanded), Common parameter, Basic settings, Drive, Blind/shutter, Safety/weather, Automatic sun protection, Status messages (highlighted), Scene assignments, and Shutter actuator C+D. The main area shows the 'Status messages' configuration for 'Shutter actuator A+B'. At the top, there are radio buttons for 'Apply from template' (unselected) and 'Individual' (selected). Below this, several parameters are listed with checkboxes and dropdown menus:

Parameter	Enabled	Send value of group object
Enable group objects "Status Height/Slat"	<input checked="" type="checkbox"/>	After change or on request
Enable group objects "Status Upper/Lower end pos."	<input checked="" type="checkbox"/>	After change or on request
Enable group object "Status Operability"	<input checked="" type="checkbox"/>	After change or on request
Enable group object "Status Automatic sun protection"	<input checked="" type="checkbox"/>	After change or on request
Enable group object "Status information"	<input checked="" type="checkbox"/>	After change or on request

# KNX Combi Switch Actuators SAH/S

## ETS

### Shutter Actuator – Scene assignment

- Available for individual configuration or template
- Activation for of up to 16 scenes 1 byte
- Recall and storage of scenes via 1 byte object
- Scene recall also via group object (for scene 1 ... 4)
  - Additional 1 bit object to activate the scene
  - Advantage: 1 bit is easier to handle for some sensors than 1 byte
- Delay in running the drive
  - Application: delayed start of the drives to avoid load peak
- Position height or slat individually adjustable

1.2.1 SAH/S8.16.7.1 Switch/Shutter Act, 8-f, 16A, MDRC > Shutter actuator A+B > Scene assignments

+ Manual operation	Parameter setting	<input type="radio"/> Apply from template <input checked="" type="radio"/> Individual
+ Safety/weather alarms	Overwrite scenes on download	<input checked="" type="checkbox"/>
+ Logic/threshold	Enable scene assignment 1	<input checked="" type="checkbox"/>
+ Switch actuator template	Scene recall also via group object	<input checked="" type="checkbox"/>
+ Shutter actuator template	Scene number	1
- Shutter actuator A+B	Delay	00:00:00 hh:mm:ss
Common parameter	Position height (0% = top; 100% = bottom)	50 %
Basic settings	Position slat (0% = open; 100% = closed)	50 %
Drive	Enable scene assignment 2	<input type="checkbox"/>

# KNX Combi Switch Actuators SAH/S

Which answer is correct?

## Question 1

Templates ...

- A** ... are for saving time during commissioning with ETS
- B** ... are for assigning the same parameter to many channels
- C** ... are split into different parameter blocks

# KNX Combi Switch Actuators SAH/S

Which answer is correct?

## Question 1

Templates ...

- A** ... are for saving time during commissioning with ETS
- B** ... are for assigning the same parameter to many channels
- C** ... are split into different parameter blocks

# KNX Combi Switch Actuators SAH/S

Which answer is correct?

## Question 2

- A** Central group objects must be used for all outputs
- B** Up to 24 logic/threshold functions can be linked to internal outputs or used independently
- C** Shutter control in SAH/S has no travel time detection but can be connected with the shutter control unit JSB/S 1.1

# KNX Combi Switch Actuators SAH/S

Which answer is correct?

## Question 2

- A Central group objects must be used for all outputs
- B Up to 24 logic/threshold functions can be linked to internal outputs or used independently
- C Shutter control in SAH/S has no travel time detection but can be connected with the shutter control unit JSB/S 1.1

# KNX Combi Switch Actuators SAH/S

Which answer is correct?

## Question 3

- A** For activation of scenes 1 bit and 1 byte group objects exist
- B** On a local push button the operability of a shutter output of SAH/S can be shown
- C** Staircase function can be disabled, staircase time can be changed via KNX telegram

# KNX Combi Switch Actuators SAH/S

Which answer is correct?

## Question 3

- A** For activation of scenes 1 bit and 1 byte group objects exist
- B** On a local push button the operability of a shutter output of SAH/S can be shown
- C** Staircase function can be disabled, staircase time can be changed via KNX telegram

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# KNX Combi Switch Actuators SAH/S

Commercial and Marketing Aspects “KNX Combi Switch Actuators SAH/S”

# KNX Combi Switch Actuators SAH/S

Range

## Order Code (ABB Version)

Switch/Shutter Actuator	Order Code
SAH/S 8.6.7.1	2CDG110244R0011
SAH/S 16.6.7.1	2CDG110245R0011
SAH/S 24.6.7.1	2CDG110246R0011
SAH/S 8.10.7.1	2CDG110247R0011
SAH/S 16.10.7.1	2CDG110248R0011
SAH/S 24.10.7.1	2CDG110249R0011
SAH/S 8.16.7.1	2CDG110250R0011
SAH/S 16.16.7.1	2CDG110251R0011
SAH/S 24.16.7.1	2CDG110252R0011



Comprehensive range, reasonable price per channel

# KNX Combi Switch Actuators SAH/S

Range

## Order Code (Busch-Jaeger Version)

Switch/Shutter Actuator	Order Code
SAH/S 8.10.7.11	2CDG110247R0021
SAH/S 16.10.7.11	2CDG110248R0021
SAH/S 24.10.7.11	2CDG110249R0021
SAH/S 8.16.7.11	2CDG110250R0021
SAH/S 16.16.7.11	2CDG110251R0021
SAH/S 24.16.7.11	2CDG110252R0021



Comprehensive range, reasonable price per channel

# KNX Combi Switch Actuators SAH/S

## Microsite

Product page with the first main information and links to further related pages

[LINK](#)

**ABB** HOME - OFFERINGS - LOW VOLTAGE PRODUCTS - HOME AND BUILDING AUTOMATION GLOBAL SITE

## ABB i-bus® KNX Combi Switch Actuators

Switch to a smarter tomorrow

The new ABB i-bus® KNX Combi Switch Actuators combine flexibility with compact design and offer switching and shading functionality in a device half the size. Ideally suited to dynamic requirements found in residential projects. These digital ready components allow future feature extension for a smarter tomorrow.

With its large selection of currents and wide range of channels the Combi Switch Actuators offer the highest flexibility on the market. Developed and manufactured in Germany to highest quality standards, the KNX Switch Actuator portfolio is tailored for diverse project requirements in today's buildings.

Are you looking for support or purchase information?  
+ Contact us

### Main benefits

- Flexible switching and shading**  
Selectable switching and shading functionality in one device for flexibility from planning to final realization and subsequent changes
- Efficiency**  
Cost-effective, space- and time-saving thanks to compact devices with high channel density that double the space in the distribution board
- Safety & Usability**  
User friendly and intuitive to use; increased safety thanks to an operation foil which prevents from unauthorized operation

### Main features

- Selectable switching and shading functionality
- High channel density: 2 switching outputs or 1 shutter output per module width
- Suitable for multi-phase operation
- Simplified commissioning thanks to template pages
- Easy commissioning thanks to template pages and group objects

# KNX Combi Switch Actuators SAH/S

## Homepage

[www.abb.com/KNX](http://www.abb.com/KNX)

→ Products and Downloads

→ Outputs

→ Search Options SAH/S

Product Manual

CAD Drawing

Installation and Operating Instructions

Specification Text

ETS Application

Selection Table

CE & RoHS Declaration of Conformity

• • •

### Detailed information for: SAH/S24.10.7.1

This page contains technical data sheet, documents library and links to offering related to this product. [Print...](#)  
If you require any other information, please contact us using form located at the bottom of the page. [Print to Pdf...](#)

Data Sheet Downloads

#### SAH/S24.10.7.1

##### General Information

Extended Product Type: SAH/S24.10.7.1

Product ID: 2CDG110249R0011

EAN: 4016779066839

Catalog Description: SAH/S24.10.7.1 Switch/Shutter Actuator, 24-fold, 10 A, MDRC

Long Description: The compact 10 A combi switch actuator has 24 independent switching relays (no electromechanically interlocking). The outputs can be used individually via ABB i-bus® KNX for switching electrical loads or in pairs for controlling 230 V AC roller shutter or blind drives. The device features a manual operation, which can also be disabled. Via the manual operation the outputs can be operated manually and the switching or driving status is displayed. The device is powered by KNX and requires no additional power supply.



Show all (10)

Data sheet (2)

Declaration of conformity (1)

Drawing (2)

Manual (1)

Operating instruction (1)

Software (1)

Tender specification (2)



ETS Application (knxprod) [XX] SAH/Sx.y.7.1  
Summary: ETS Application SAH/Sx.y.7.1 Version 1.0  
Software - German, English - 2019-10-30 - 8,17 MB

KNXPROD



Product Manual (.PDF) [EN] SAH/S x.x.7.1  
Summary: Product manual SAH/S x.x.7.1  
Manual - English - 2019-10-30 - 6,37 MB

PDF



Specification text (.PDF) [EN] SAH/S24.10.7.1  
Summary: Specification text SAH/S24.10.7.1  
Tender specification - English - 2019-10-30 - 0,12 MB

PDF



Specification text (.RTF) [EN] SAH/S24.10.7.1  
Summary: Specification text SAH/S24.10.7.1  
Tender specification - English - 2019-10-30 - 0,05 MB

RTF

# KNX Combi Switch Actuators SAH/S

## Range Overview

Smarter Solutions for Home and Building Automation

ABB i-bus KNX

Product Range Overview 2019/2020

Including Combi Switch Actuators SAH/S

[LINK](#)




**Smarter Solutions for Home and Building Automation**  
**ABB i-bus® KNX**  
**Product Range Overview 2019/2020**

Product description, quick and easy selection of product codes

42 PRODUCT RANGE OVERVIEW 2019/2020 BAKK107492-A3100 REV. B

**ABB i-bus® KNX**  
 Outputs – Combi Switch Actuators

**Switching/Shading Actuator, 6 A, MDRC** NEW  
 The compact 6 A combi switch actuator has 8, 16 or 24 independent switching relays (no electromechanically interlocking). The outputs can be used individually via ABB i-bus® KNX for switching electrical loads or in pairs for controlling 230 V AC roller shutter or blind drives. The device features a manual operation, which can also be disabled. Via the manual operation the outputs can be operated manually and the switching or driving status is displayed. The device is powered by KNX and requires no additional power supply.  
 Available November 2019



SAH/S 6.6.7.1

Description	Mod. width	Order details		Price 1 piece	Weight 1 piece	Pack unit
		Type code	Order code			
8-fold	4	SAH/S 6.6.7.1	ZCCG10244R0011	0.349		1
16-fold	8	SAH/S 16.6.7.1	ZCCG11024R0011	0.396		1
24-fold	12	SAH/S 24.6.7.1	ZCCG11024R0011	0.83		1

**Switching/Shading Actuator, 10 A, MDRC** NEW  
 The compact 10 A combi switch actuator has 8, 16 or 24 independent switching relays (no electromechanically interlocking). The outputs can be used individually via ABB i-bus® KNX for switching electrical loads or in pairs for controlling 230 V AC roller shutter or blind drives. The device features a manual operation, which can also be disabled. Via the manual operation the outputs can be operated manually and the switching or driving status is displayed. The device is powered by KNX and requires no additional power supply.  
 Available November 2019



SAH/S 16.10.7.1

Description	Mod. width	Order details		Price 1 piece	Weight 1 piece	Pack unit
		Type code	Order code			
8-fold	4	SAH/S 8.10.7.1	ZCCG11024R0011	0.349		1
16-fold	8	SAH/S 16.10.7.1	ZCCG11024R0011	0.396		1
24-fold	12	SAH/S 24.10.7.1	ZCCG11024R0011	0.83		1

**Switching/Shading Actuator, 16 A, MDRC** NEW  
 The compact 16 A combi switch actuator has 8, 16 or 24 independent switching relays (no electromechanically interlocking). The outputs can be used individually via ABB i-bus® KNX for switching electrical loads or in pairs for controlling 230 V AC roller shutter or blind drives. The device features a manual operation, which can also be disabled. Via the manual operation the outputs can be operated manually and the switching or driving status is displayed. The device is powered by KNX and requires no additional power supply.  
 Available November 2019



SAH/S 24.16.7.1

Description	Mod. width	Order details		Price 1 piece	Weight 1 piece	Pack unit
		Type code	Order code			
8-fold	4	SAH/S 8.16.7.1	ZCCG11028R0011	0.349		1
16-fold	8	SAH/S 16.16.7.1	ZCCG11028R0011	0.396		1
24-fold	12	SAH/S 24.16.7.1	ZCCG11028R0011	0.83		1

# KNX Combi Switch Actuators SAH/S

## Combi Switch Actuators

### Summary of the Features and Advantages

- High channel density with 2 channels per module  
→ less installation space in distribution boards with cost saving
- Choice between switching and shading  
→ high flexibility also in the phase of installation and commissioning
- Proven connection terminals with screws, on the same level  
→ easy and stress-free wiring for the panel builder
- All products with innovative Keypad for manual operation  
→ simple but powerful manual operation with reduced number of keys and LED's
- Up to 24 independent channels  
→ very cost efficient solution (costs per channel) with no restrictions in functions
- Optimized ETS Application  
→ easy to operate, saves time and satisfies the programmer



# KNX Combi Switch Actuators SAH/S

## Combi Switch Actuators

### Summary of the Features and Advantages

- Versions with 6, 10 and 16A
  - products available for the different market requirements
- New hardware platform and digital ready components
  - allows in future feature extensions
- Completion of the range with the standard and professional actuators
  - Products for all demands and markets from one manufacturer
- Designed and produced in Germany
  - highest quality standard



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