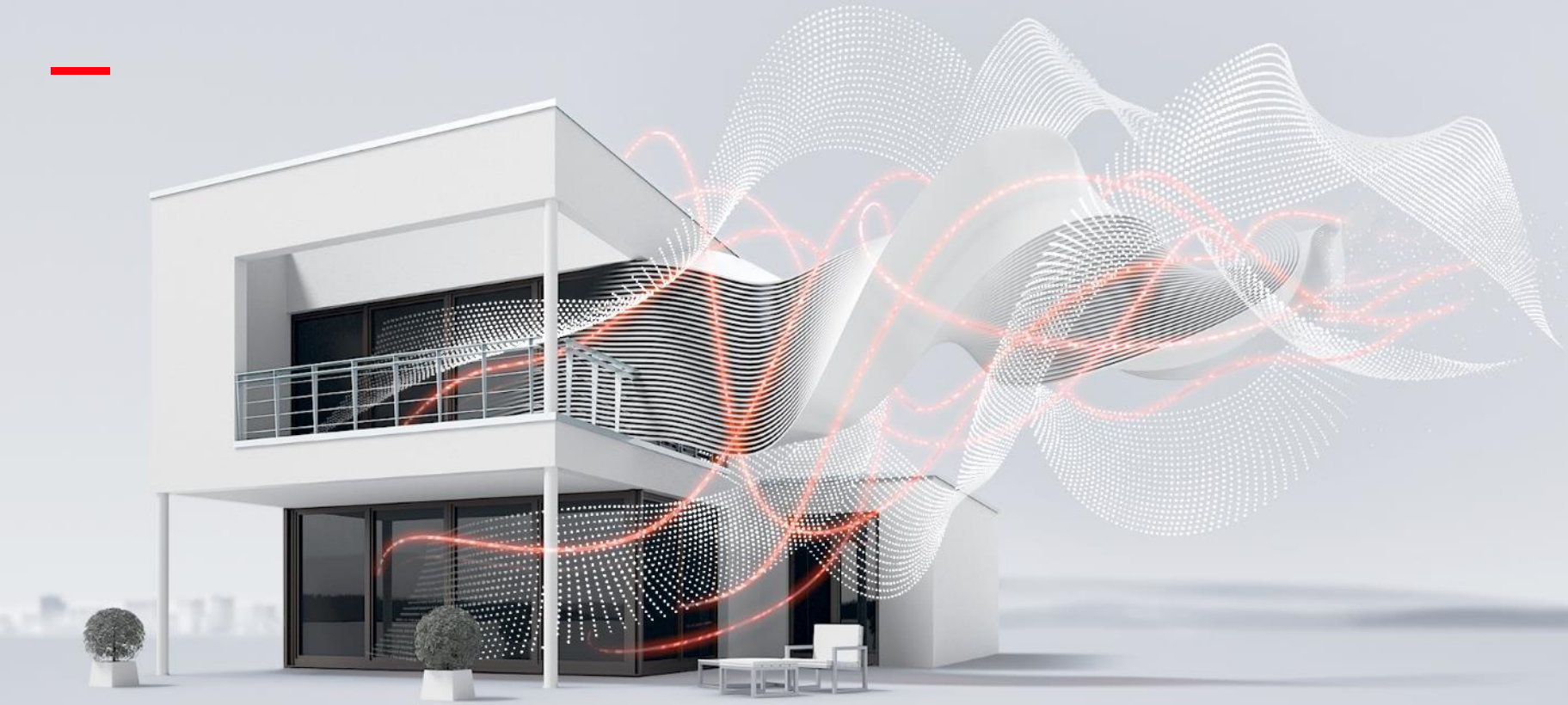


JUNE 2020

KNX Combi Switch Actuator SAH/S – Shutter Functions

Online Learning Session – Competence Center Europe – Smart Buildings

Thorsten Reibel, Jürgen Schilder, Stefan Grosse, Martin Wichary & Olaf Stutzenberger

 Document ID.: Rev.:

Agenda

Overview KNX Combi Switch Actuators and Applications

ETS Application Combi Switch Actuators with Function Shutter

Differences between Combi Switch Actuator SAH/S and Shutter Actuators JRA/S

KNX Combi Switch Actuator - Shutter Functions

Overview and Applications

KNX Combi Switch Actuator - Shutter Functions

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)

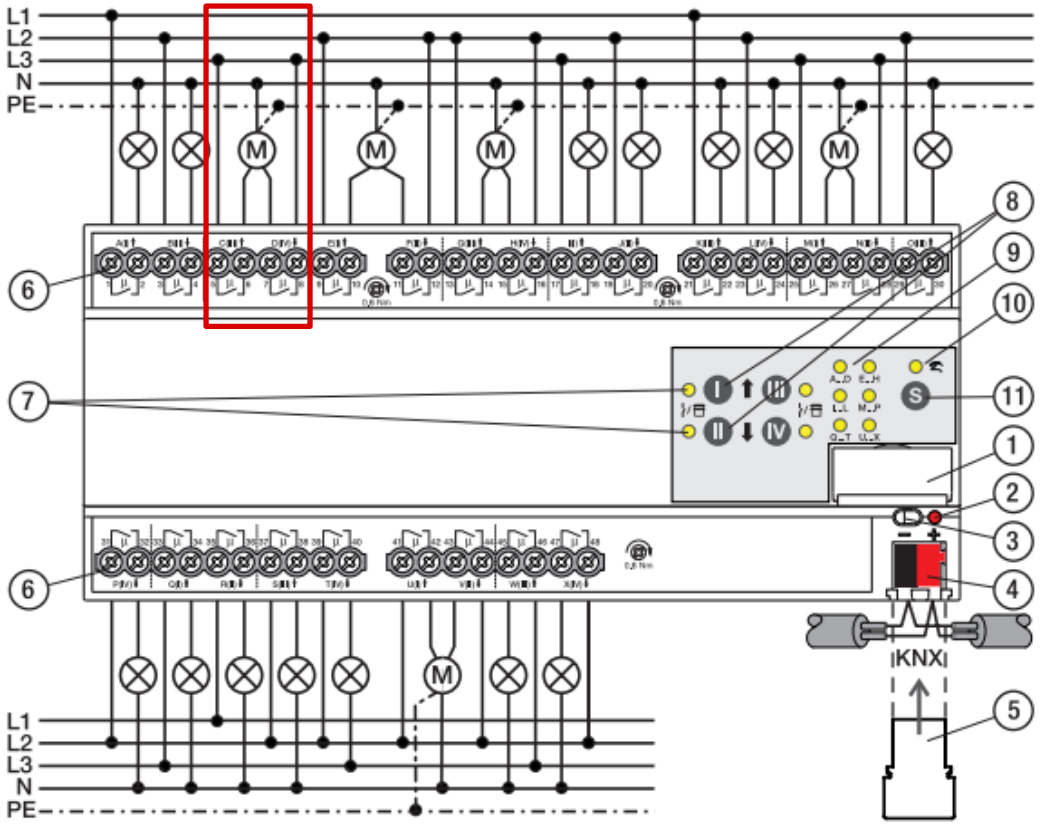
16A (3 devices)

MW = Module Width (17.5mm)

KNX Combi Switch Actuator - Shutter Functions

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)



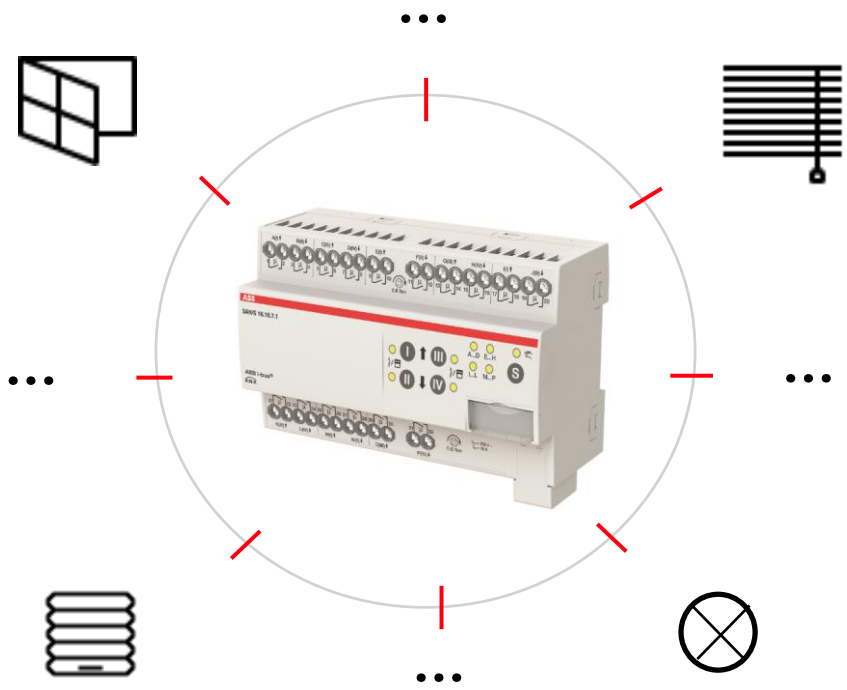
KNX Combi Switch Actuator - Shutter Functions

Overview Applications

Blinds: Up/down and step/stop

Combi Switch Actuators are ideal for the control of drives in the area of sun protection:

- Control with slat adjustment
  - Blinds
  - Exterior blinds
  - Slat blinds
  - Panel curtains
  - …



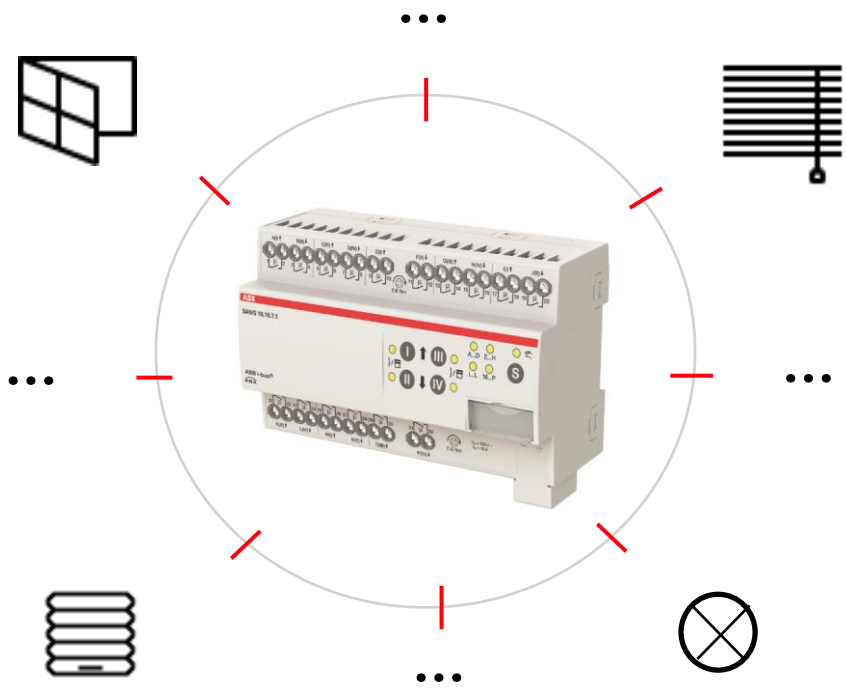
KNX Combi Switch Actuator - Shutter Functions

Overview Applications

Shutter: Up/down (open/close) and stop

Combi Switch Actuators are ideal also for the control of drives of following components:

– Control without slat adjustment
  - Roller shutters
  - Roller blinds
  - Screens
  - Vertical blinds
  - Awnings
  - Pleated curtains
  - Skylights
  - Pool cover
  - Windows
  - …



KNX Combi Switch Actuator - Shutter Functions

ETS Application

KNX Combi Switch Actuator - Shutter Functions

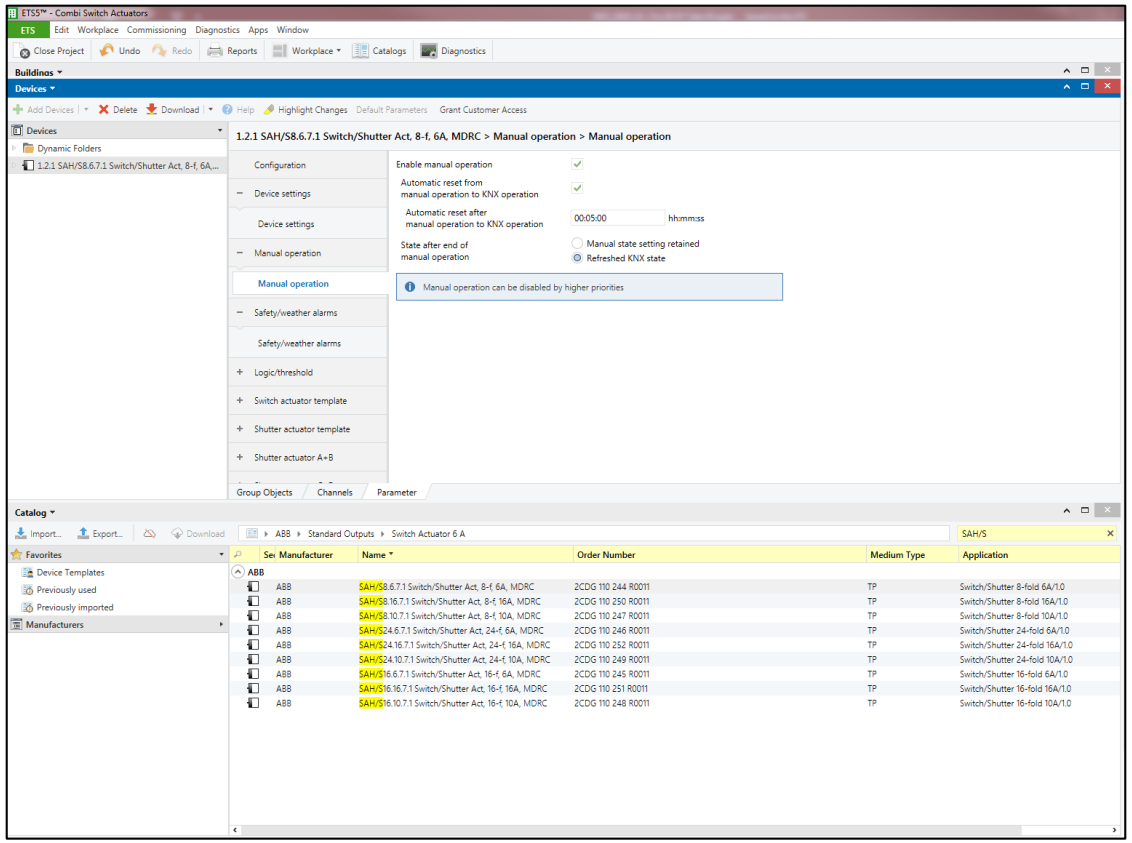
ETS Application Combi Switch Actuator

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 (1 byte)
- Central objects (switching, shutter functions, scenes)
- Colored hints simplify work
- ETS5 is required

More details about application in general with switching functions
→ session KNX Combi Switch Actuator – ETS Application

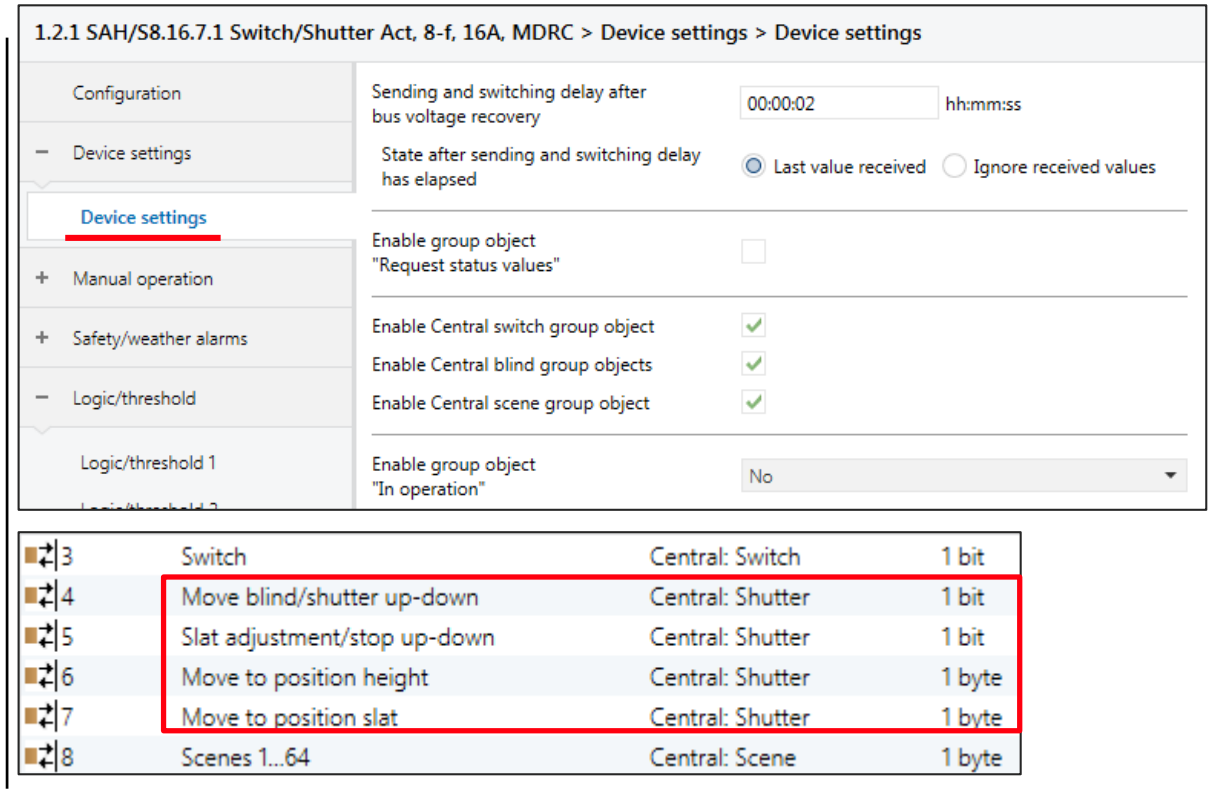


KNX Combi Switch Actuator - Shutter Functions

ETS

Device Settings (per device)

– 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

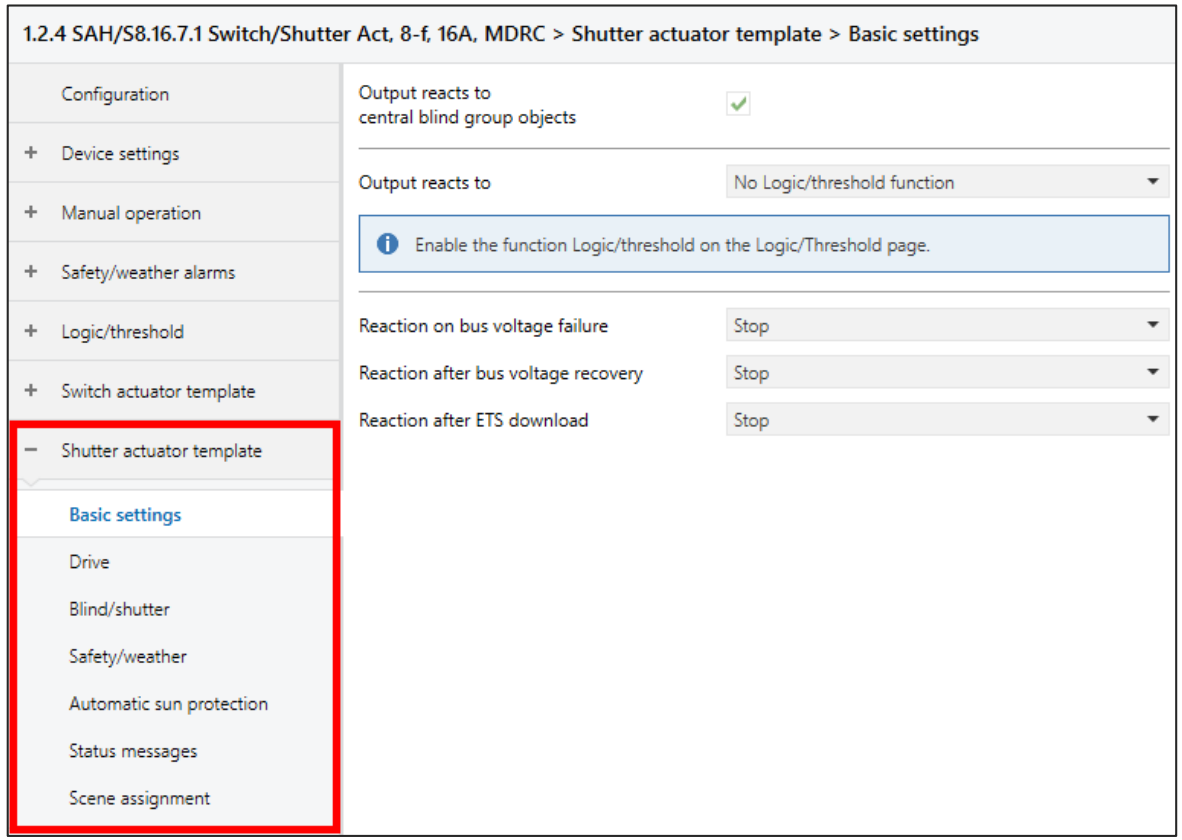


KNX Combi Switch Actuators SAH/S

ETS

Shutter Actuator Template (per device)

- 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 pages)
  - For Shutter: Basic settings, Drive, Blind/shutter, Safety/weather, Automatic sun protection, Status messages, Scene assignment
  - For each output and parameter page 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

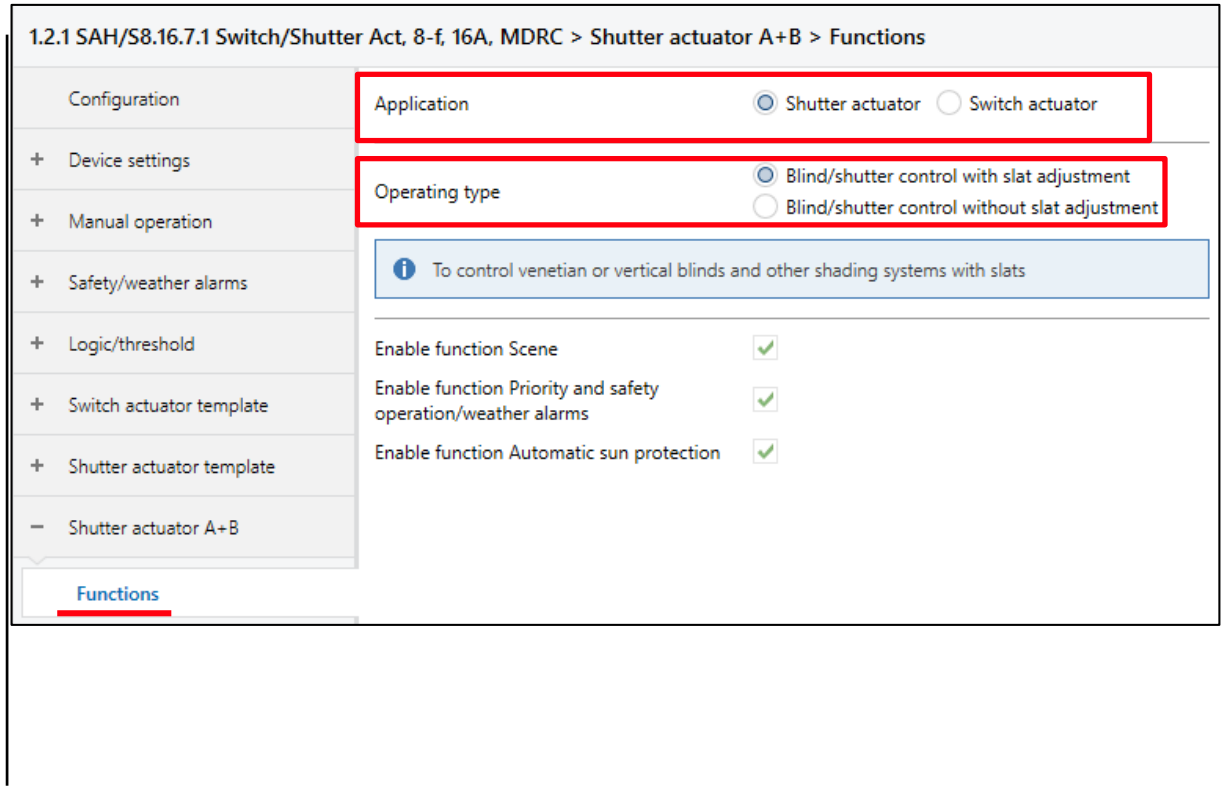


KNX Combi Switch Actuator - Shutter Functions

ETS

Shutter Actuator – Functions (per channel)

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

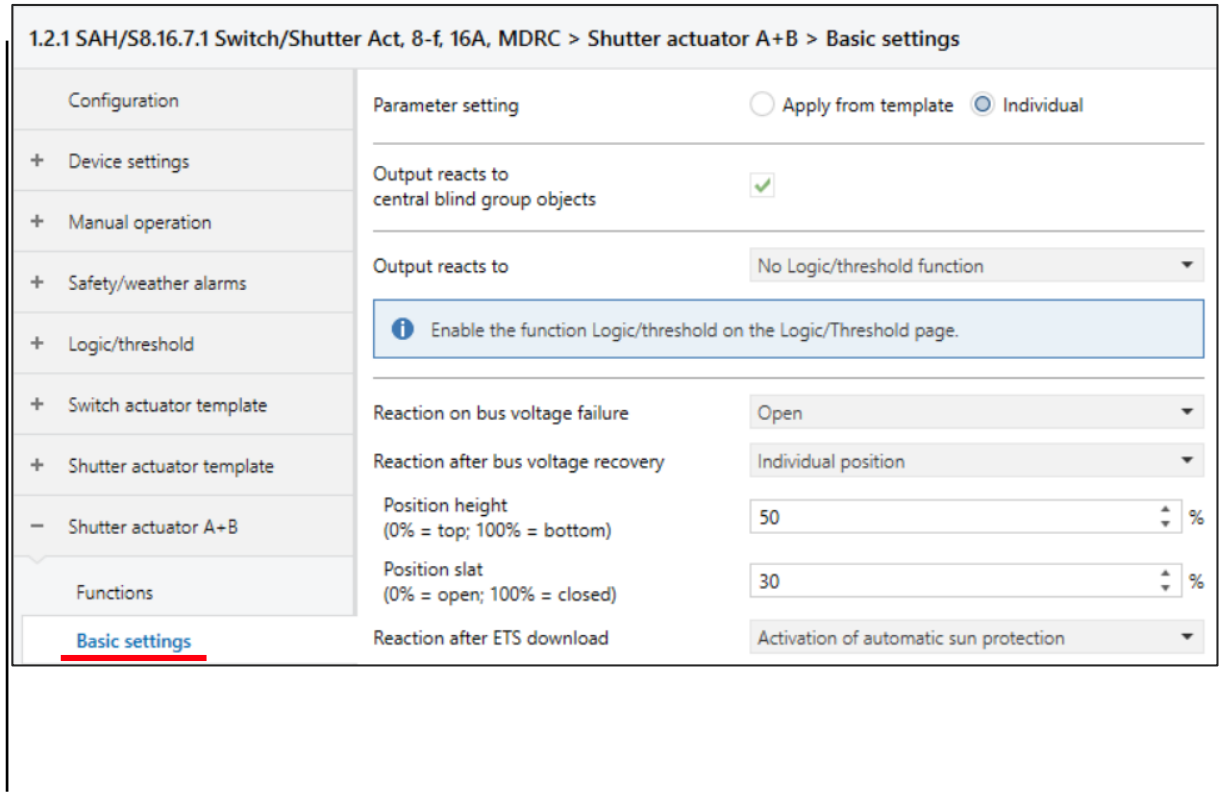


KNX Combi Switch Actuator - Shutter Functions

ETS

Shutter Actuator – Basic settings (per channel)

- Available for individual configuration or template
- Reaction to central object to create individual ‘central’ function
- Reaction on logic/threshold function
  - No Logic/threshold function, Logic/threshold 1…24
  - Though logic is independent of any output, it can be directly assigned
  - For more details of logic in Combi Switch Actuator see Online Session KNX Combi Switch Actuator – ETS Application
- Reaction on bus voltage failure and recovery or after ETS download
  - No reaction, open, down, stop, individual position (height and slat) , activation of automatic sun position

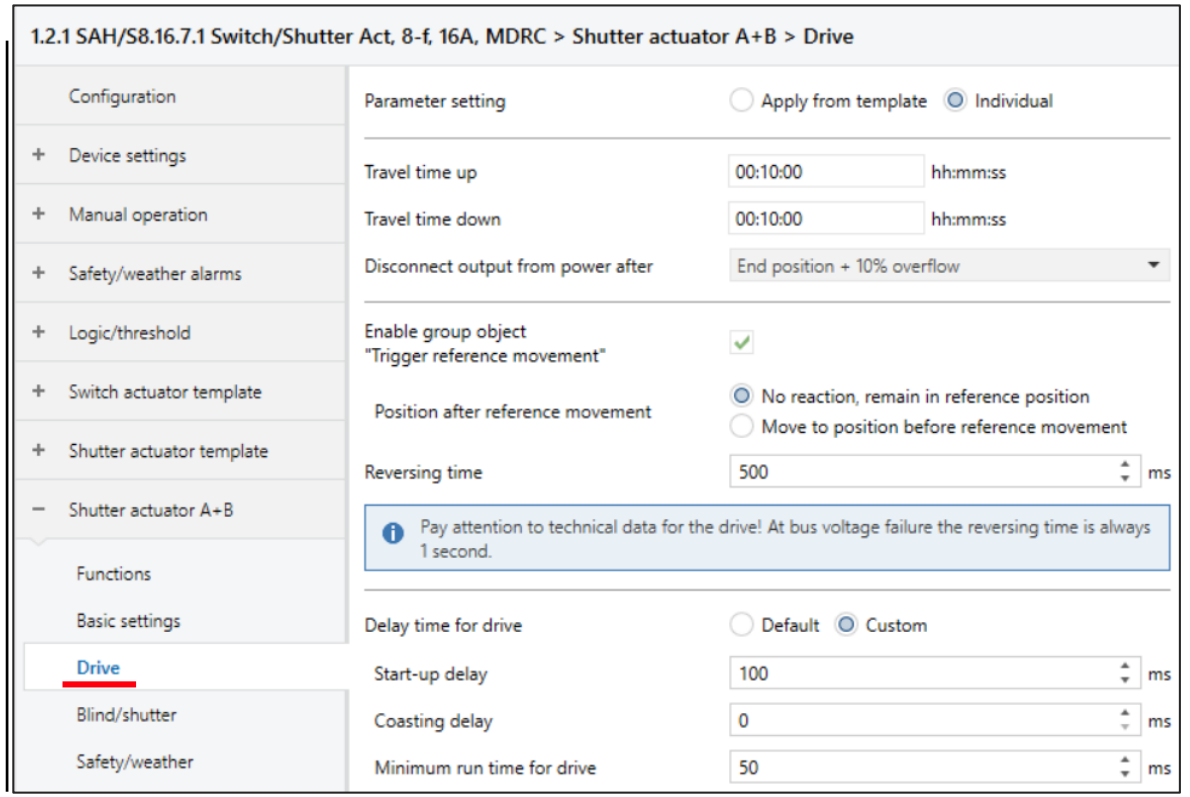


KNX Combi Switch Actuator - Shutter Functions

ETS

Shutter Actuator – Drive (per channel)

- 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 like JRA/S x.y.**5**.1
- 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

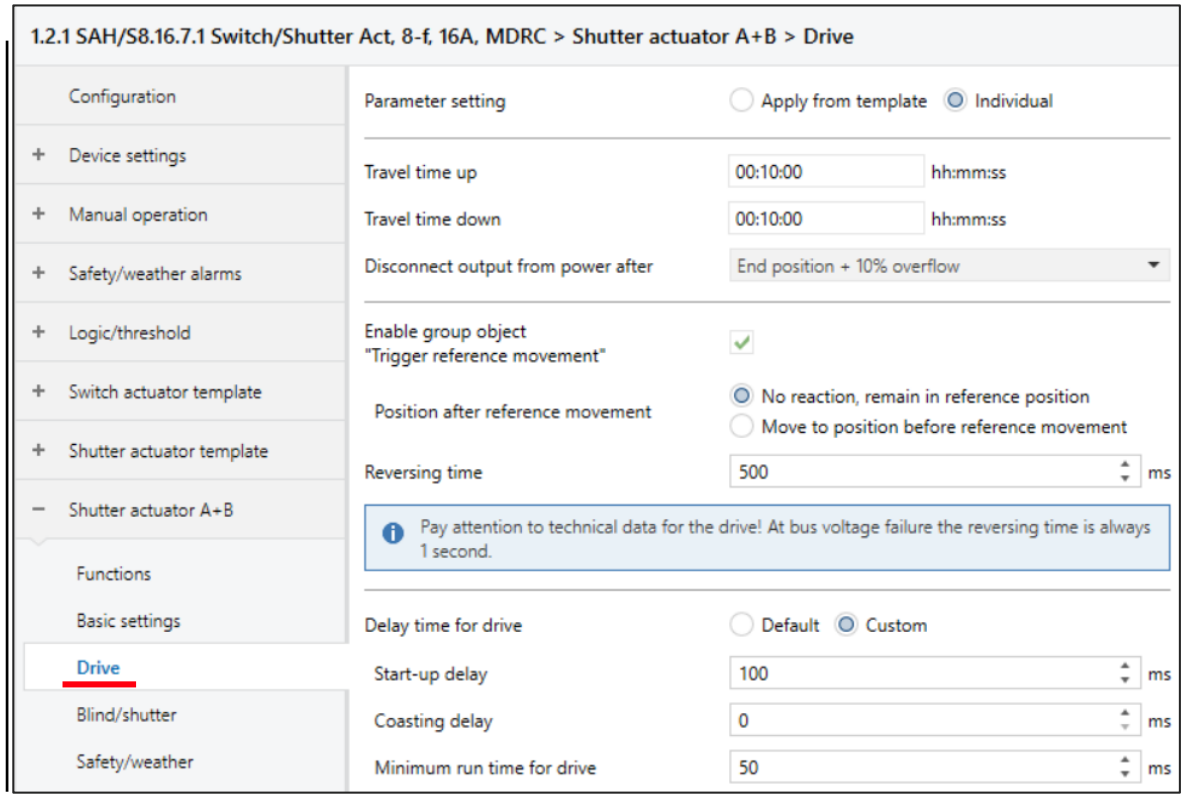


KNX Combi Switch Actuator - Shutter Functions

ETS

Shutter Actuator – Drive (per channel)

- Available for individual configuration or template
- Reversing time: Time the drive stops when the direction of the hanging will be reversed, to avoid too strong mechanical and electrical load
  - 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 milli-seconds after switch-off (coasting delay). It may 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

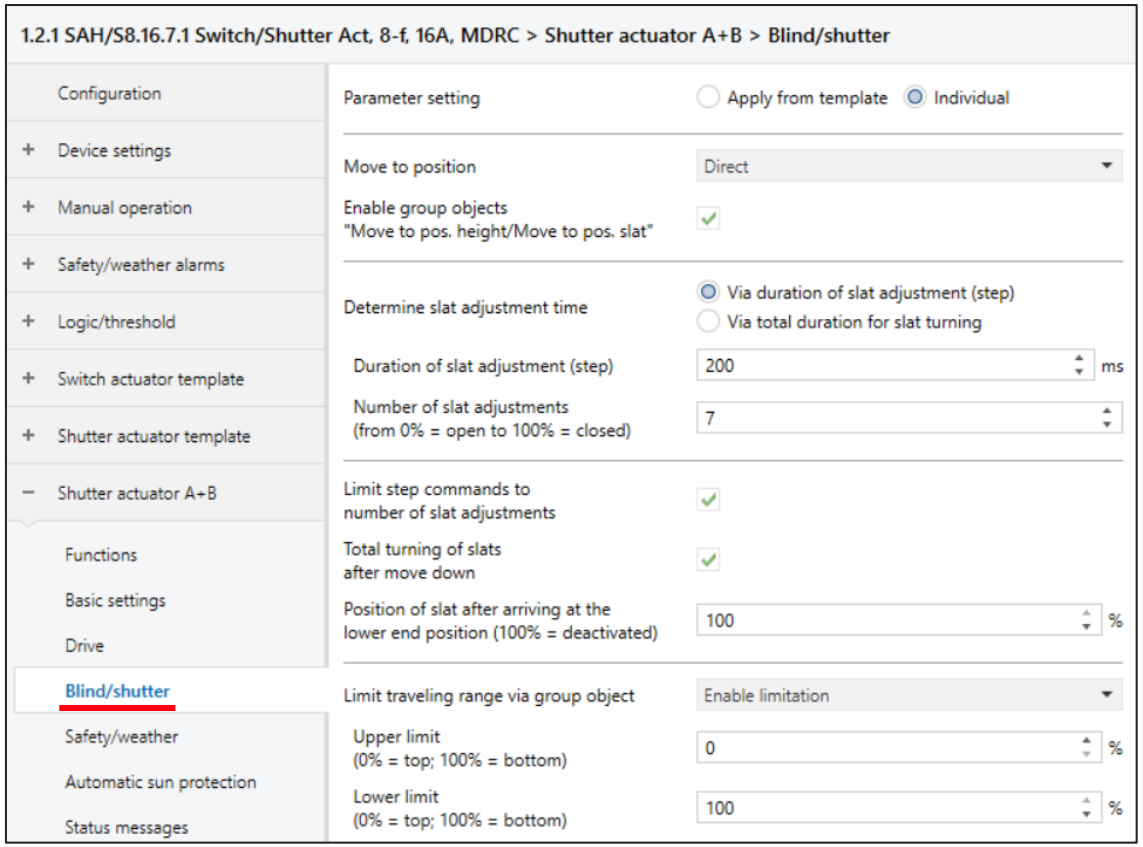


KNX Combi Switch Actuator - Shutter Functions

ETS

Shutter Actuator – Blind/Shutter (per channel)

- Available for individual configuration or template
- Move to position (1 byte object, 0 % (open)…100%(closed))
  - Direct, indirectly via upper/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 for slat turning: Time 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 to adjust the brightness in the room

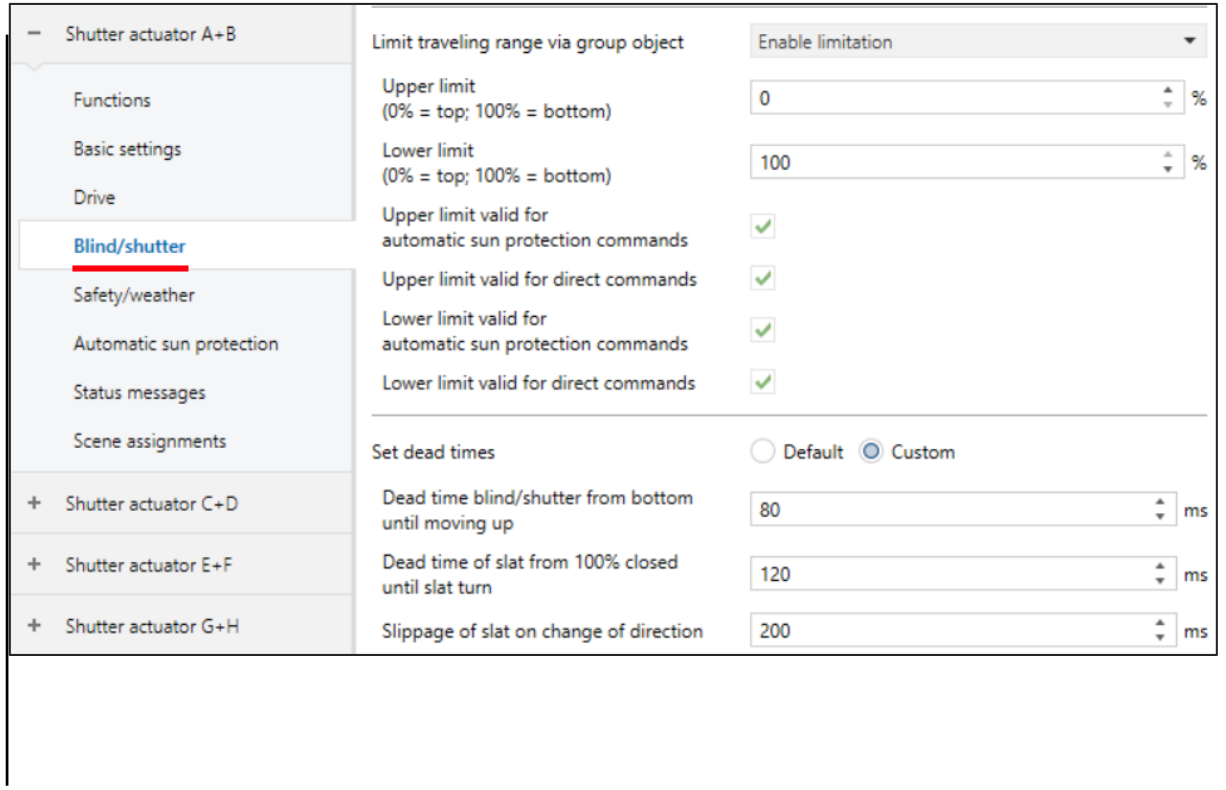


KNX Combi Switch Actuator - Shutter Functions

ETS

Shutter Actuator – Blind/Shutter (per channel)

- Travelling range limitation upper/lower limit depending on function (automatic sun protection and direct commands)
- Direct commands:
  - Move blind/shutter Up-Down
  - Slat adjustment/stop Up-Down
  - Move to position height
  - Move to position slat
  - Scene 1 … 64
- 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



KNX Combi Switch Actuator - Shutter Functions

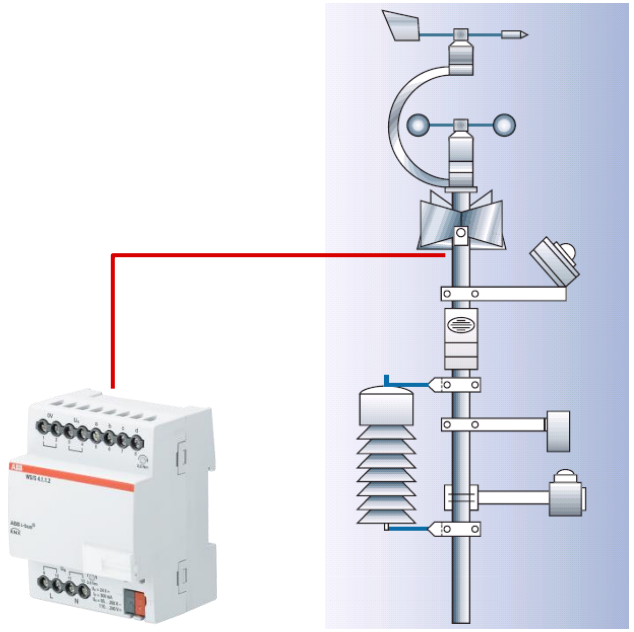
Safety/Weather Alarms - Weather Stations to detect Wind, Frost and Rain

Weather Sensor, WES/A 3.1 and Weather Unit WZ/S 1.3.1.2

Solution mainly for residential projects

Weather Station WS/S 4.1.1.2

For commercial projects, common weather sensors can be connected (0-10V, 4-20mA, etc.)

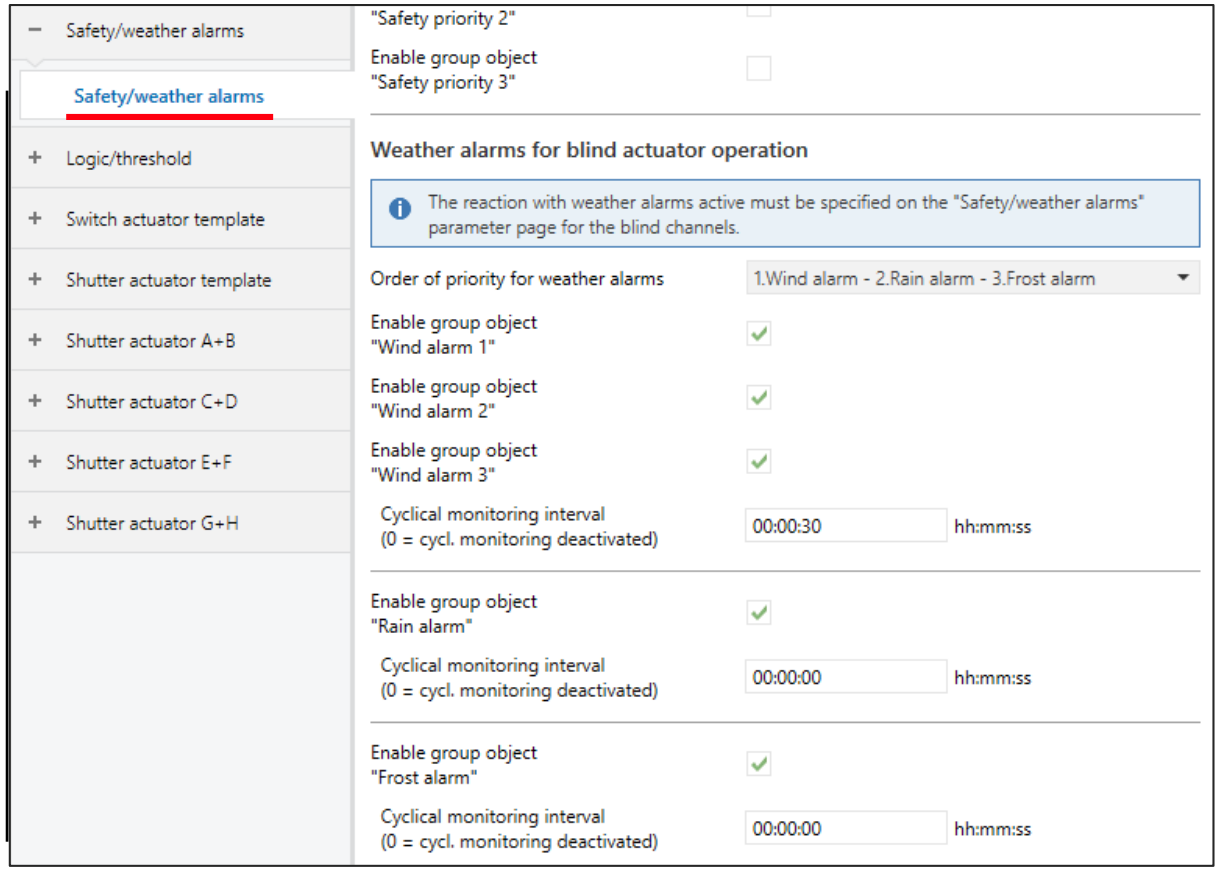


KNX Combi Switch Actuator - Shutter Functions

ETS

Safety/Weather Alarms (per device)

- Distinction between switch and shutter functionality
- Shutter
  - Three Wind alarms / 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

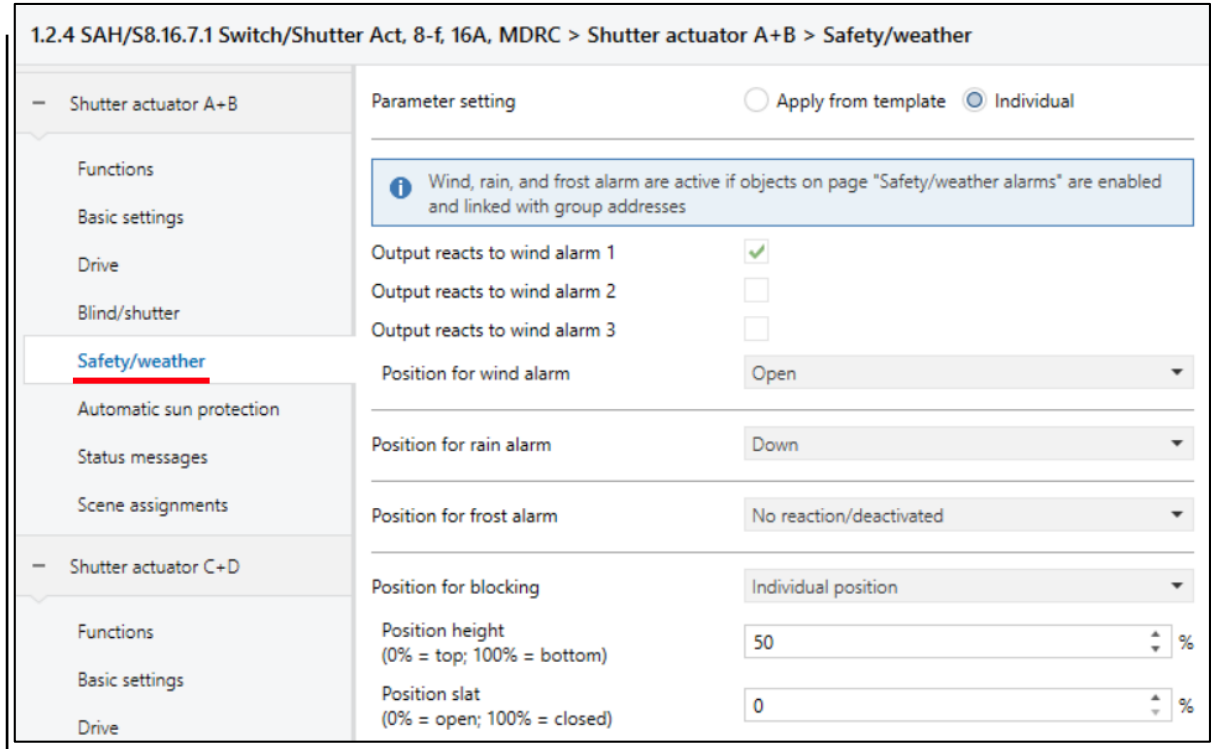


KNX Combi Switch Actuator - Shutter Functions

ETS

Shutter Actuator – Safety/weather (per channel)

- Available for individual configuration or template
- Reaction of the drive on different safety or weather conditions
  - No reaction, up, down, stop, unchanged, recall scene, individual position (height and slat)
  - Up to three wind sensors can be assigned
    Application: Complex building structure with different wind situations at the various 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
    Application: Cleaning of window with shutter up and blocked



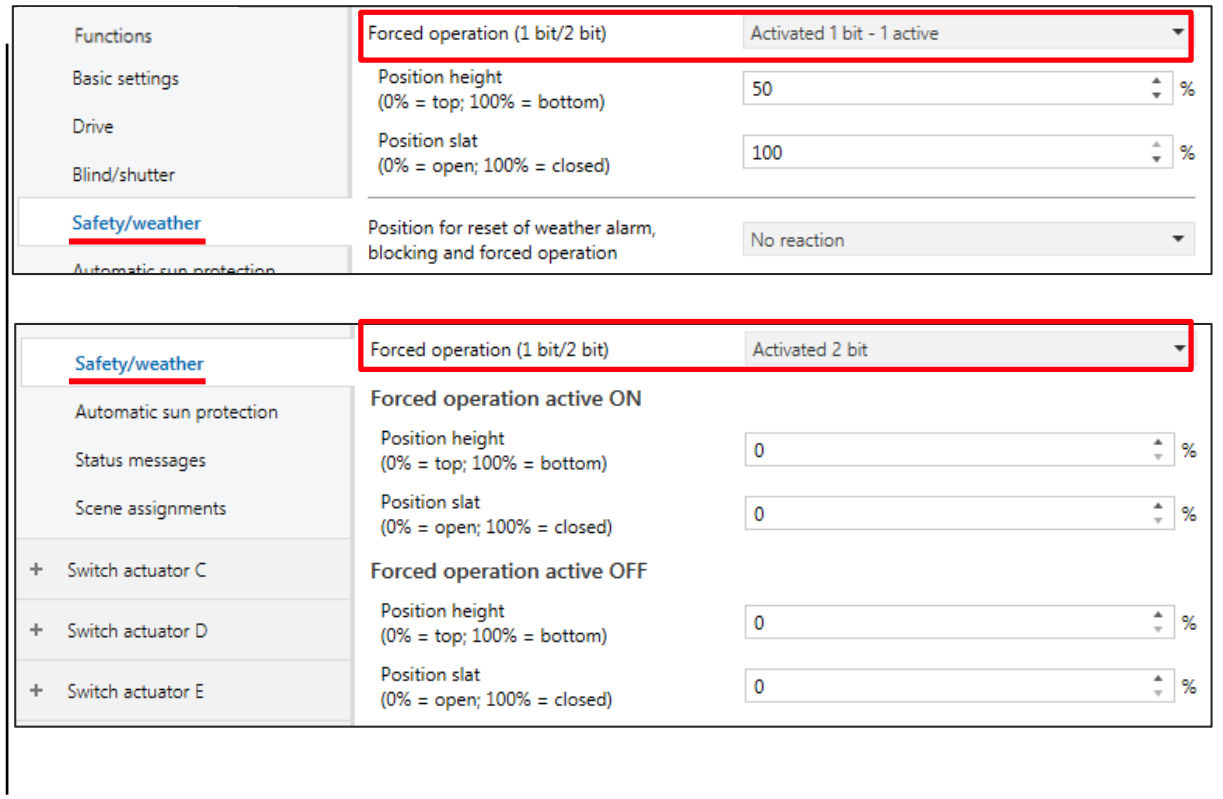
KNX Combi Switch Actuator - Shutter Functions

ETS

Shutter Actuator – Safety/weather (per channel)

- Forced operation via 1 or 2 bit
  Application: Roof windows open in case of fire alarm
- 1 bit
  - one position for height and slat
  - Activation with value 0 **or** 1
- 2 bit (practically triggered via visualization)
  - two different positions for height and slat possible
  - Activation with value 3 (active on) **and** 2 (active off)

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)

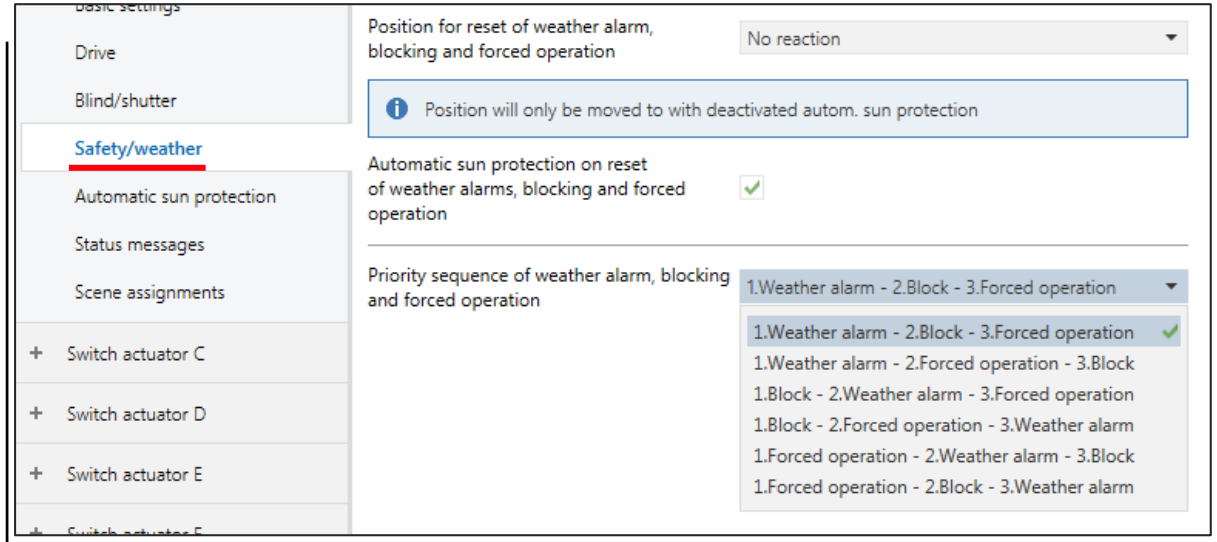


KNX Combi Switch Actuator - Shutter Functions

ETS

Shutter Actuator – Safety/weather (per channel)

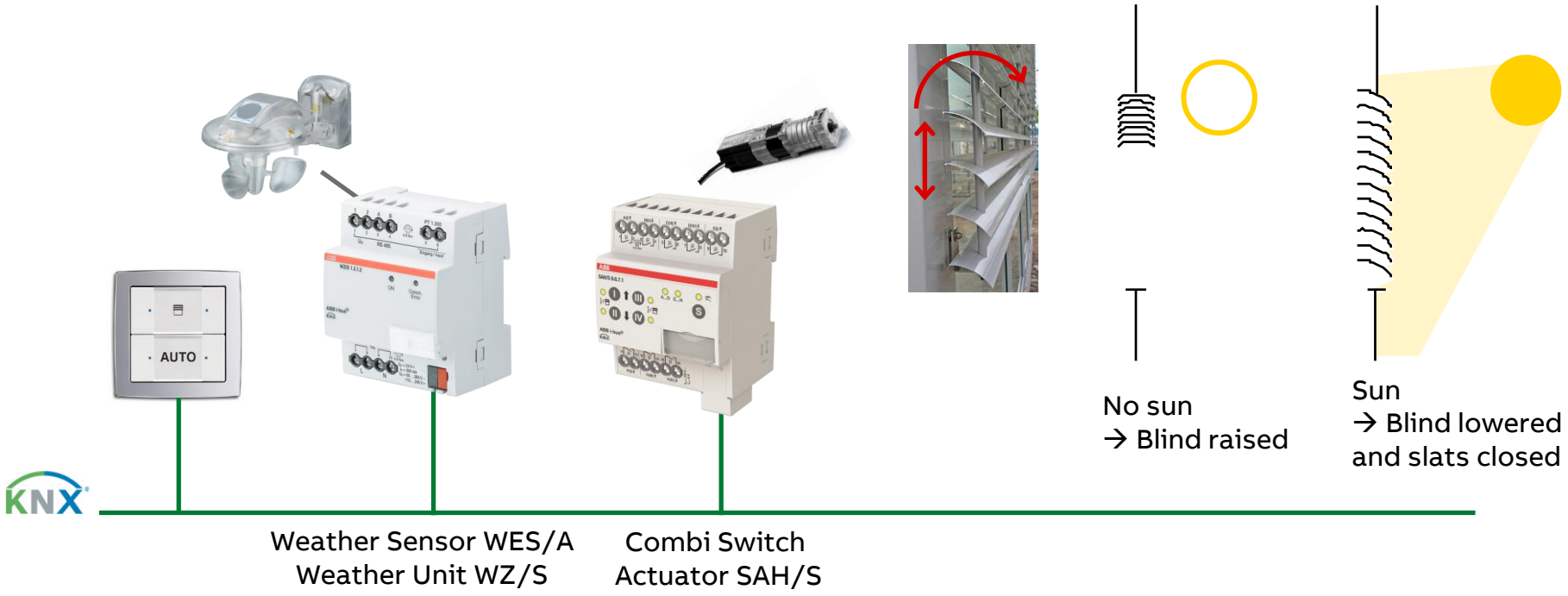
- Position for reset of weather alarm, blocking and forced operation
  - No reaction, up, down, stop, unchanged, scene, individual position, refreshed KNX state (any background functions during safety/weather functions will be carried out)
- Automatic sun protection on reset of weather alarms, blocking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



KNX Combi Switch Actuator - Shutter Functions

Automatic Sun Protection

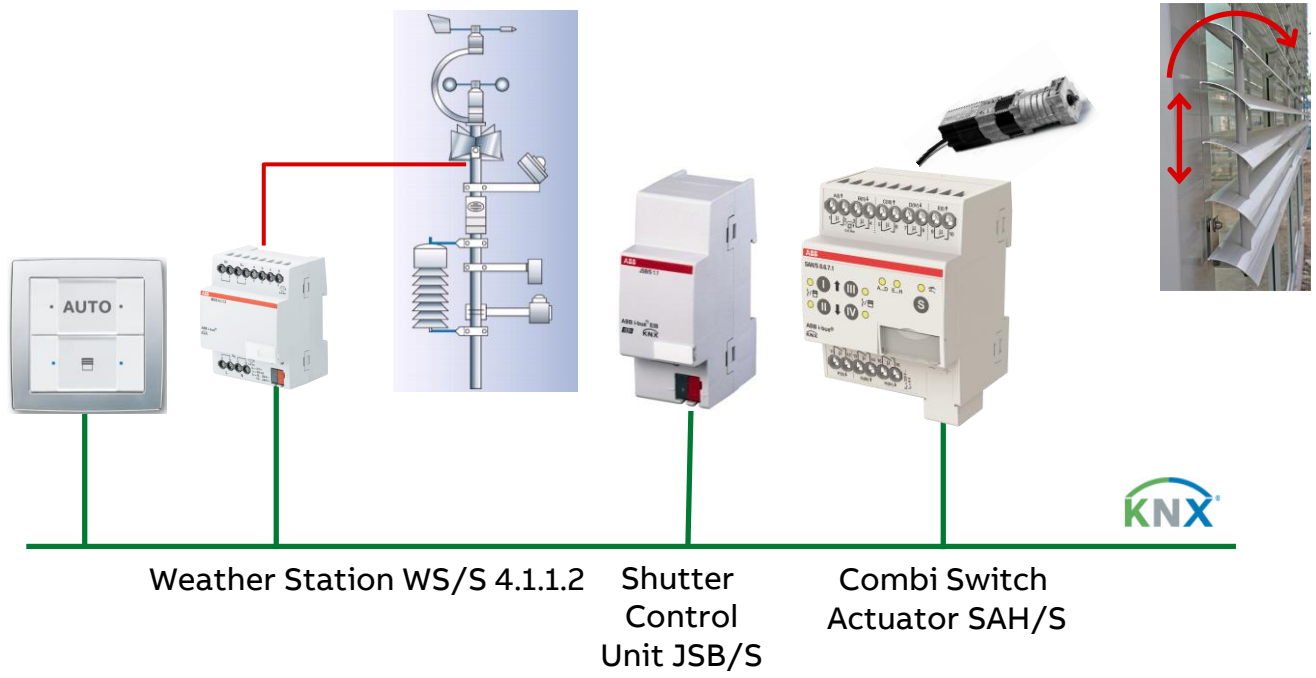
Standard Sun Automatic

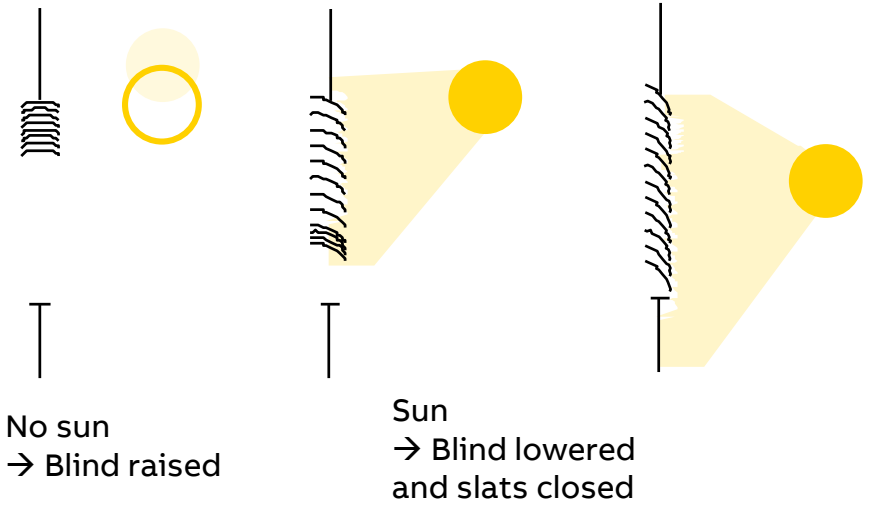


KNX Combi Switch Actuator - Shutter Functions

Automatic Sun Protection

Blind control depending on sun position with Shutter Control Unit JSB/S 1.1





No sun
→ Blind raised

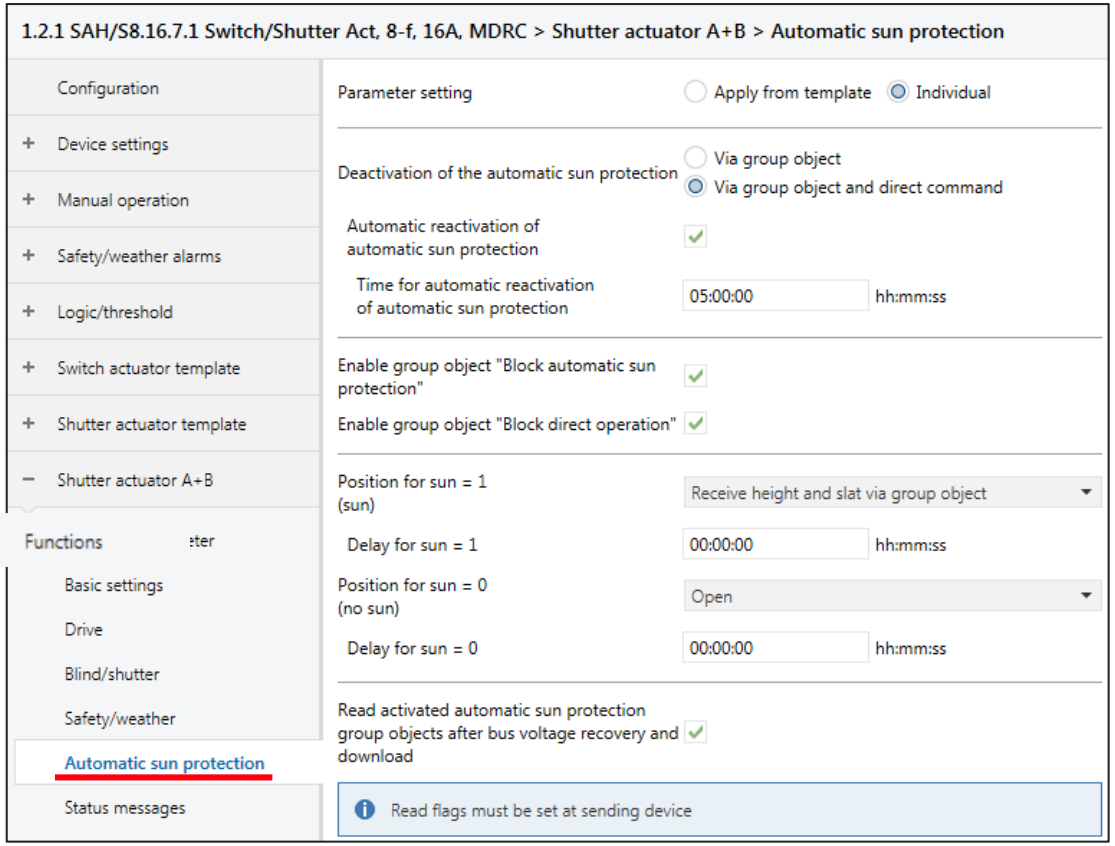
Sun
→ Blind lowered and slats closed

KNX Combi Switch Actuator - Shutter Functions

ETS

Shutter Actuator – Automatic sun protection (per channel)

- Automatic sun protection runs the drive depending on over/undershooting of outside 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

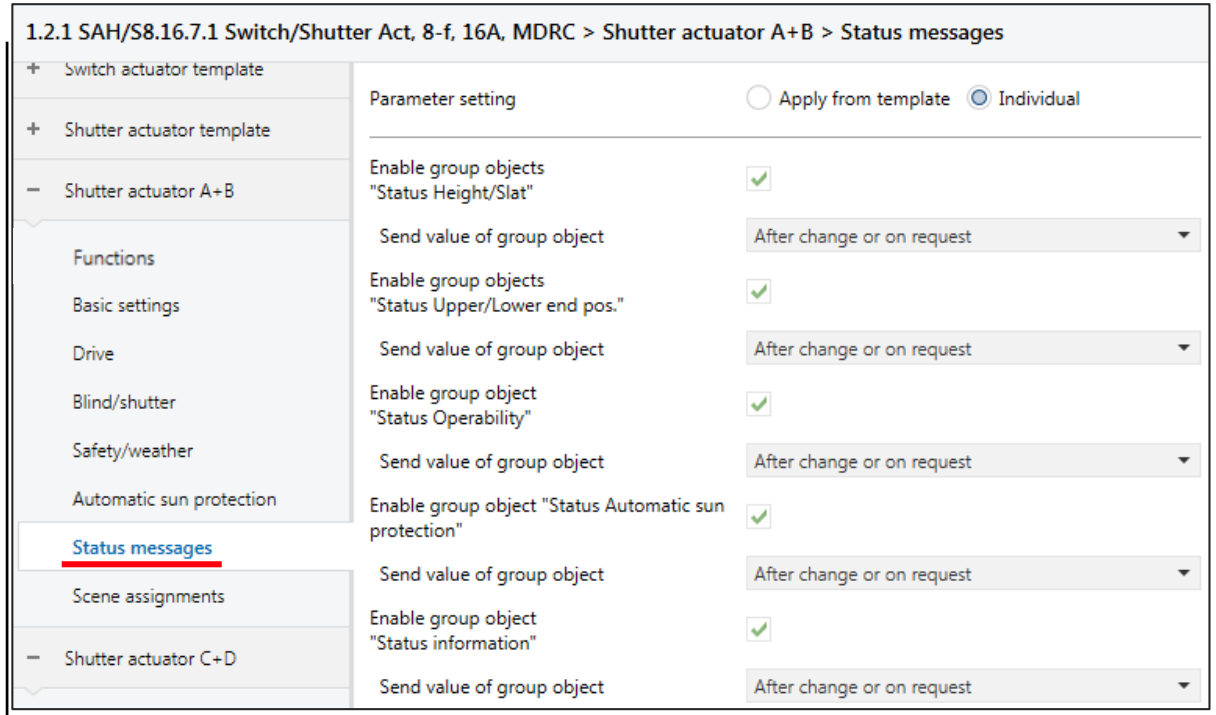


KNX Combi Switch Actuator - Shutter Functions

ETS

Shutter Actuator – Status messages (per channel)

- Group objects for following status messages:
  - Height/Slats (1 byte, 0…100%)
  - Upper/Lower end position (1 bit)
    Application: A curtain must not be moved when the window is open. Conversely, a drive must not open the window when the awning is down
  - 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)
  - Status Information (1 byte, e.g. safety, - time,- or manual operation active)
    Application: Presentation of various status information with text in a visualization



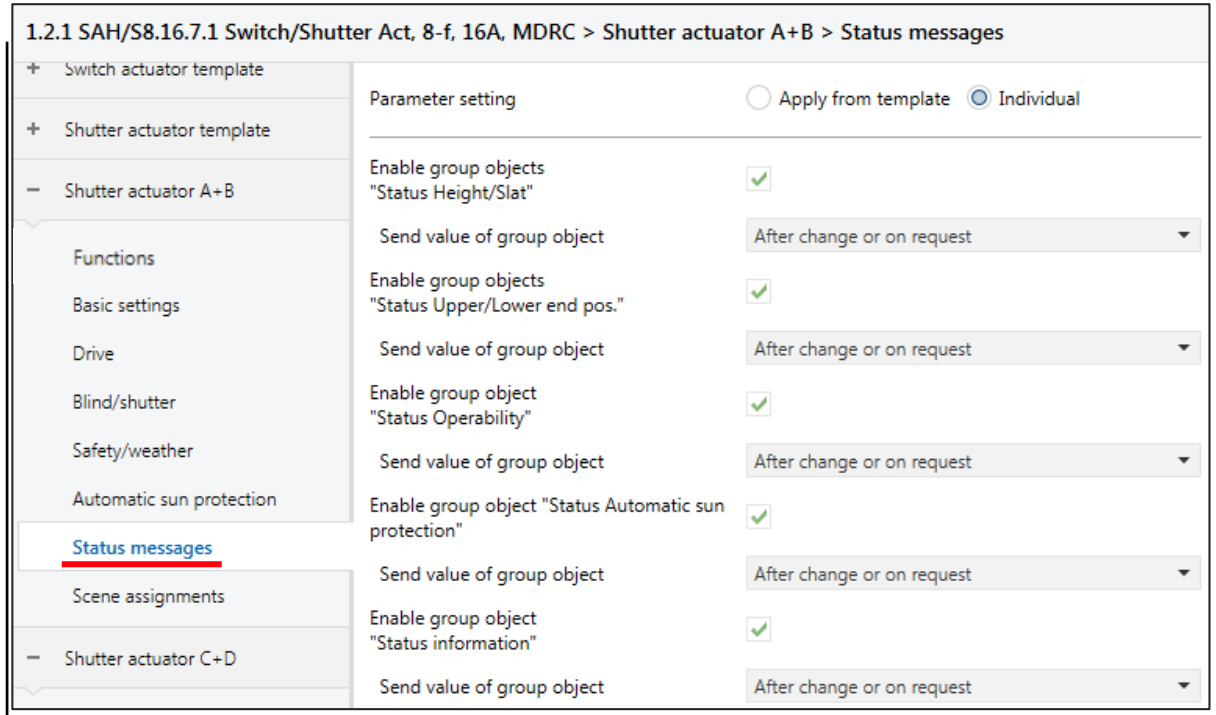
KNX Combi Switch Actuator - Shutter Functions

ETS

Shutter Actuator – Status messages (per channel)

– Parameter options (to adapt the number of status telegrams):

- No, update only (value in group object will be updated but not sent on the bus. Possible to achieve the status 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, e.g. intentional request from visualization)
- After change **and** on request

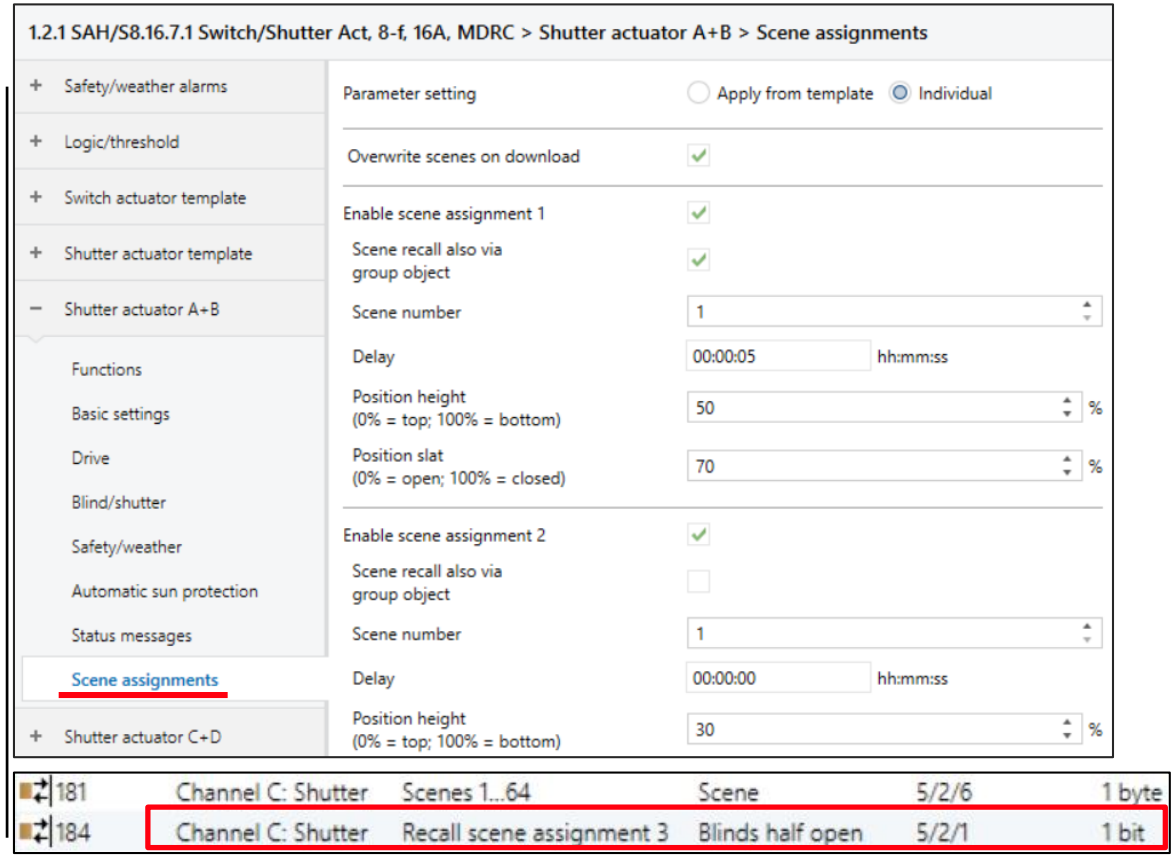


KNX Combi Switch Actuator - Shutter Functions

ETS

Shutter Actuator – Scene assignment (per channel)

- 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 further 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



KNX Combi Switch Actuator - Shutter Functions

1 byte Light Scene

Short: Calling KNX scene No. 6 “**Good Morning**”

KNX

Dim Actuator UD/S
Bedroom: A - n.A.
Staircase: B - n.A.
…

Switch Actuator SA/S
Kitchen light: A - n.A.
Kitchen socket outlets: B - ON
Corridor light: C - n.A.
Bathroom light: D - n.A.
Children room: E - n.A.
….

Combi Switch Actuator SAH/S
Blind Kitchen: A - 80%
Blind Living room: B - 50%
Blind Bathroom: C - 100%
Blind Bedroom: D - 90%
Blind Children room: E - n.A.
…

Security Module:
Unset

RTC:
Comfort mode

DG/S x.64.5.1:
Livingroom light:
75% and 3,200K
RGB LED strips: -n.A.
…

HUE:
Lights n.A.

SONOS:
Music - PLAY

n.A. – no assignment

KNX Combi Switch Actuator - Shutter Functions

Combi Switch Actuator SAH/S ←→ Shutter Actuator JRA/S

KNX Combi Switch Actuator - Shutter Functions

Main Differences: Combi Switch Actuator SAH/S ←→ Shutter Actuator JRA/S

Feature	Combi Switch Actuator SAH/S	Shutter Actuator JRA/S
Number of Channels for Shutter	4, 8, 12	2,4,6*,8 *JRA/S 6.230.3.1 with binary inputs
Option Switching / Number of Channels	yes / 8,16,24	yes / 2,4,6,8
Relay current	6, 10, 16 A	6 A
Actuator for 24V DC	no	yes, JRAS/S 4.24.5.1
Change over contact with mechanical lock	no, two relays per shutter output with software lock	yes
ABB i-bus Tool support	(yes), soon available in 2020	yes
Blind Control depending on sun position together with Shutter Control Unit JSB/S 1.1	yes	yes
Travel Time Detection via current measurement	no	yes, JRA/S x.y.**5**.1
Parameter for Switching Functions	yes	only Staircase Lighting and invert output (Ventilation Flaps)
ETS Application (special functions)	Central group objects, 8 bit scenes with delay and 1 bit object to recall, Logic functions, Templates	1 bit preset (4x, move to and set position), 8 bit scenes, Heating/Cooling automatic, Overheat control

KNX Combi Switch Actuator - Shutter Functions

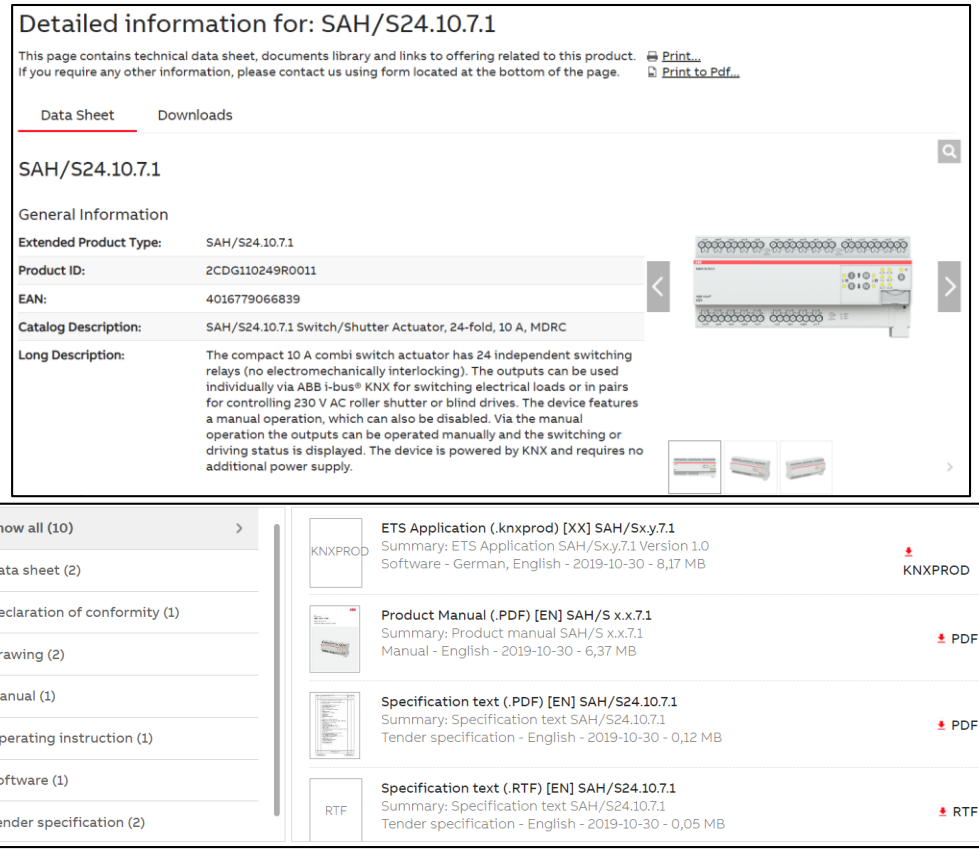
Online Learning Session

Homepage

www.abb.com/KNX

→ Products and Downloads
→ Lighting Control
→ Search Options DG/S

- Product Manual
- CAD Drawing
- Installation and Operating Instructions
- Specification Text
- ETS Application
- Selection Table
- CE & RoHS Declaration of Conformity
- • • •



KNX Combi Switch Actuator - Shutter Functions

Online Learning Session

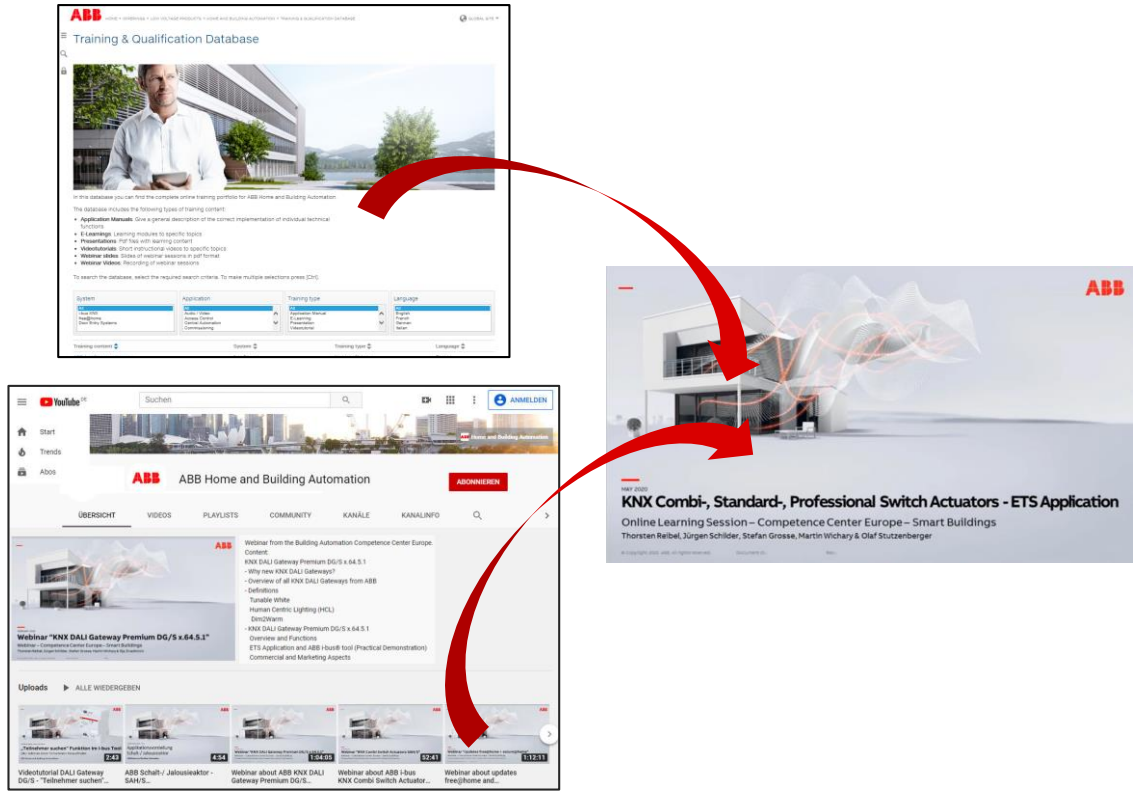
Further information

Training & Qualification Database

– The database includes the following types of training content:
  - Application Manuals
  - E-Learnings
  - Presentations
  - Video tutorials
  - Webinar slides and videos
  - www.abb.com/knx or https://go.abb/ba-training

YouTube

– Channel “ABB Home and Building Automation”
  - https://www.youtube.com/user/ABBibusKNX



KNX Combi Switch Actuator - Shutter Functions

Online Learning Session

Further information

Training (ABB internal) and Learning (external) Package Shading in Buildings, based on shutter actuator JRA/S

– The package with various information around KNX and shutter control includes:
  - Presentation
  - Exercise
  - ETS Project

Link to download the packages “Shading in Buildings“ will be published in the feedback mail

KNX Combi Switch Actuator - Shutter Functions

Online Learning Session

Training & Qualification Calendar

In addition to the online modules and the traditional training programs offered by your local ABB sales team, we offer a variety of on-site trainings conducted by our specialists at different ABB training facilities

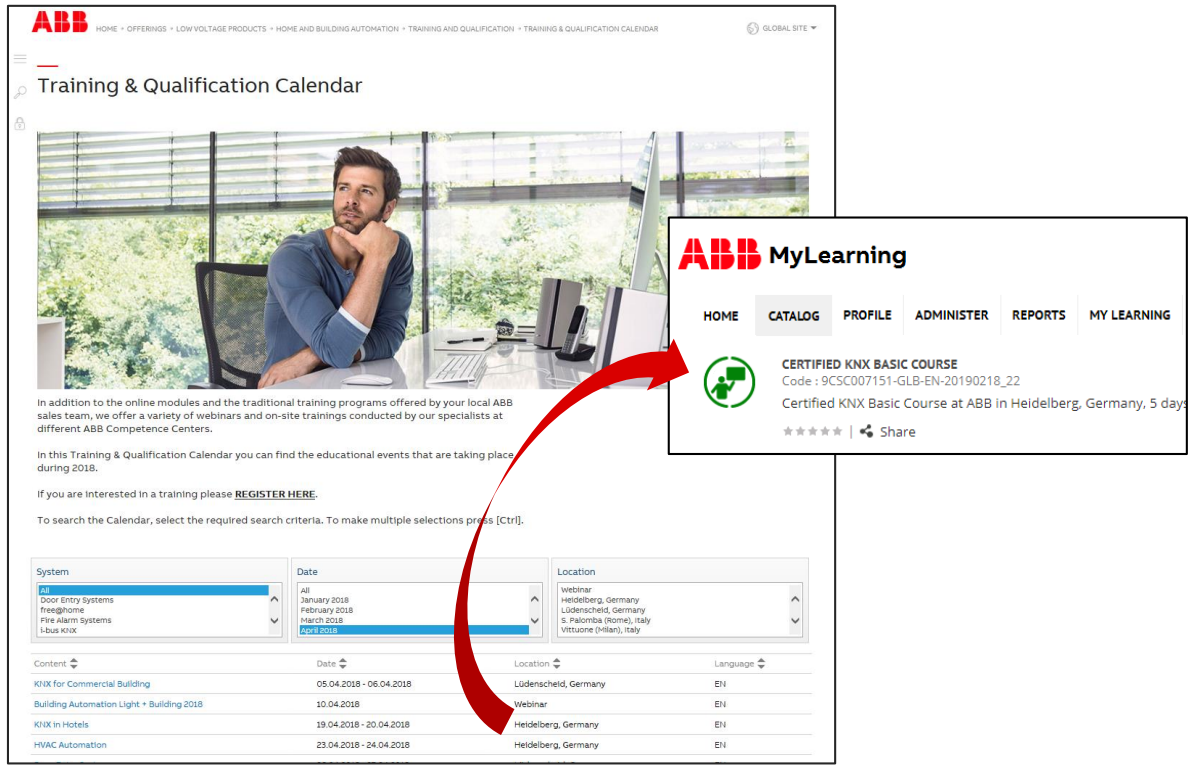
In this Training & Qualification Calendar you can find the educational events that are taking place during 2020

If you are interested in a training please click the training und you will be forwarded to register in “ABB MyLearning”

www.abb.com/knx or https://go.abb/ba-training

→ Training and Qualification

→ Training Calendar



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