ABB i-bus® KNX
Switch Actuator, Current Detection, x-fold, 16/20 A, C-Load, MDRC
SA/S x.16.6.1, 2CDG1101xxR0011

SA/S 8.16.6.1

Product description

Switch Actuators SA/S x.16.6.1, 16/20 A are modular installation devices in Pro*M* design for installation in the distribution board. They are especially suitable for switching loads with high peak inrush currents such as lighting equipment with compensation capacitors or fluorescent lamp loads (AX) to EN 60 669.

The Switch Actuators feature one load current detection per output.

The maximum load current per output is 20 A.

The Switch Actuator can be actuated manually using a button. This simultaneously indicates the contact position.

The Switch Actuators can switch up to 12 independent electrical loads via floating contacts. The maximum load current per output is 20 A. The connection of the outputs is implemented using combo-head screw terminals. Each output is controlled separately via KNX.

The device does not require an additional power supply and is ready for immediate use, after the bus voltage has been applied.

The Switch Actuators are parameterized via ETS. Connection to KNX is implemented using the bus connection terminal on the front.

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Technical data

Supply	KNX bus voltage	21…31 V			
	Current consumption via bus	< 12 mA			
	Power consumption via bus	Maximum 250 mW			
Rated output value	SA/S type	2.16.6.1	4.16.6.1	8.16.6.1	12.16.6.1
	Current detection	yes	yes	yes	yes
	Number (floating contacts)	2	4	8	12
	U_n rated voltage	250/440 V AC (50/60 Hz)			
	I_n rated current	16/20 AX, C-load			
	Leakage loss per device at max. load 16 A	2.0 W	4.0 W	8.0 W	12.0 W
	Leakage loss per device at max. load 20 A	3.0 W	5.5 W	11.0 W	16.0 W
Output switching current	AC3[1] operation (cos φ = 0.45)	16 A/230 V AC			
	To DIN EN 60 947-4-1				
	AC1[1] operation (cos φ = 0.8)	16/20 A/230 V AC			
	To DIN EN 60 947-4-1				
	Fluorescent lighting load to DIN EN 60 669-1	16/20 AX/250 V AC (200 μF)[2]			
	Minimum switching capacity	100 mA/12 V AC			
		100 mA/24 V AC			
	DC current switching capacity (resistive load)	20 A/24 V DC			
Output service life	Mechanical service life	> 10^6			
	Electrical endurance				
	To DIN IEC 60 947-4-1				
	AC1[1] (240 V/cos φ = 0,8)	> 10^5			
	AC3[1] (240 V/cos φ = 0,45)	> 3 x 10^4			
	AC5a[1] (240 V/cos φ = 0,45)	> 3 x 10^4			
Current detection (load current)	Detection range (sine effective value)	0,02…20 A			
	Accuracy	+/- 2 % of actual current value (sine) and +/- 20 mA			
	Frequency	50/60 Hz			
	2 byte representation (figure value, DTP 7.012) or 4 byte representation (floating value, DTP 14.019)	in mA			
	Measurement speed:				
	– Low-pass filter transient response with τ	300 ms			
	– Scanning frequency of the current value	320 ms			
Output switching times[3]	SA/S type	2.16.6.1	4.16.6.1	8.16.6.1	12.16.6.1
	Maximum output relay position change per minute if all relays are switched simultaneously. The position changes should be distributed equally within the minute.	30	15	7	5
	Maximum output relay position change per minute if only one relay is switched.	60	60	60	60
Connections	KNX	Via bus connection terminals, 0.8 mm Ø, solid			
	Load current circuits (1 terminal per contact)	Universal head screw terminal (PZ 1) 0.2… 4 mm² fine stranded, 2 x 0.2…2.5 mm² 0.2… 6 mm² solid, 2 x 0.2…4 mm²			
	Ferrules without/with plastic sleeves	0.25…2.5/4 mm²			
	TWIN ferrules	0.5…2.5 mm² Contact pin length min. 10 mm			
	Tightening torque	max. 0.6 Nm			

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Operating and display elements	Programming button/LED	For assignment of the physical address		
	Contact position display	Relay operator		
Degree of protection	IP 20	To EN 60 529		
Protection class	II	To EN 61 140		
Isolation category	Overvoltage category	III to EN 60 664-1		
	Pollution degree	2 to EN 60 664-1		
KNX safety extra low voltage	SELV 24 V DC			
Temperature range	Operation	- 5 °C…+45 °C		
	Storage	-25 °C…+55 °C		
	Transport	-25 °C…+70 °C		
Ambient conditions	Maximum air humidity	95 %, no condensation allowed		
Design	Modular installation device (MDRC)	Modular installation device, ProM		
	SA/S type	2.16.6.1	4.16.6.1	8.16.6.1	12.16.6.1
	Dimensions	90 x B x 64,5 mm (H x W x D)		
	Width W in mm	36	72	144	216
	Mounting width in units (18 mm modules)	2	4	8	12
	Mounting depth in mm	64.5	64.5	64.5	64.5
Weight	in kg	0.21	0.38	0.69	0.90
Mounting	On 35 mm mounting rail	To EN 60 715		
Mounting position	as required			
Housing/color	Plastic housing, gray			
Approvals	KNX to EN 50 090-1, -2	Certification		
CE mark	in accordance with the EMC guideline and low voltage guideline			

[1] Further information concerning electrical endurance to IEC 60 947-4-1 can be found in the Product Manual at: AC1, AC3, AX, C-load specifications.

[2] The maximum inrush current peak may not be exceeded.

[3] The specifications apply only after the bus voltage has been applied to the device for at least 30 seconds. Typical relay delay is approx. 20 ms.

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Lamp output load 16/20 A

Lamps	Incandescent lamp load	3,680 W
Fluorescent lamps T5/T8	Uncorrected	3,680 W
	Parallel compensated	2,500 W
	DUO circuit	3,680 W
Low-voltage halogen lamps	Inductive transformer	2,000 W
	Electronic transformer	2,500 W
	Halogen lamps 230 V	3,680 W
Dulux lamp	Uncorrected	3,680 W
	Parallel compensated	3,000 W
Mercury-vapor lamp	Uncorrected	3,680 W
	Parallel compensated	3,680 W
Switching capacity (switching contact)	Maximum peak inrush current I_p (150 µs)	600 A
	Maximum peak inrush current I_p (250 µs)	480 A
	Maximum peak inrush current I_p (600 µs)	300 A
Number of electronic ballasts (T5/T8, single element)[1]	18 W (ABB EVG 1 x 18 SF)	26[2]
	24 W (ABB EVG-T5 1 x 24 CY)	26[2]
	36 W (ABB EVG 1 x 36 CF)	22
	58 W (ABB EVG 1 x 58 CF)	12[2]
	80 W (Helvar EL 1 x 80 SC)	10[2]

[1] For multiple element lamps or other types, the number of electronic ballasts must be determined using the peak inrush current of the electronic ballasts, see the Product Manual: Ballast calculation.

[2] The number of ballasts is limited by protection with B16 circuit-breakers.

Device type	Application program	Maximum number of communication objects	Maximum number of group addresses	Maximum number of associations
SA/S 2.16.6.1	Switch 2f 16CS/…*	40	254	254
SA/S 4.16.6.1	Switch 4f 16CS/…*	76	254	254
SA/S 8.16.6.1	Switch 8f 16CS/…*	148	254	254
SA/S 12.16.6.1	Switch 12f 16CS/…*	220	254	254

* … = current version number of the application program. **Please observe the software information on our homepage for this purpose..**

Note
For a detailed description of the application program see *"SA/S Switch Actuators"* product manual. It is available free-of-charge at *www.abb.com/knx*.
The ETS and the current version of the device application program are required for programming.
The current application program can be found with the respective software information for download on the Internet at *www.abb.com/knx.* After import into ETS it appears in the *Catalogs* window under *Manufacturers/ ABB/Output/Binary output xf 16CS/…* (x = 2, 4, 8 or 12).
The device does not support the locking function of a KNX device in the ETS. If you inhibit access to all devices of the project with a *BCU code*, it has no effect on this device. Data can still be read and programmed.

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Important
The Switch Actuator types SA/S x.16.6.1 differentiate from the predecessor types SA/S x.16.5S by new hardware and software.

While there have been few changes to the functions of the software, the hardware has been redesigned for load currents up to 20 A. Furthermore, the current detection has been optimized and its accuracy has been enhanced by a factor of four.

Existing projects can be converted to ensure operation with the new hardware / software.

For further information see Product Manual: Conversion of previous application program versions.

For faster and simpler commissioning, it is also possible to copy the parameter settings of the outputs to others or to exchange them with another output.

For further information see roduct Manual: Copying and exchanging parameter settings.

Note
Only load currents with a sine wave characteristic can be detected correctly. On other signal types, e.g. phase angle or inverse phase angle control signals, the detected current value is distorted. In this case, the measured value is meaningless.

Current values less than 20 mA are indicated as a 0 mA value via KNX. For small load currents that are just above the minimum detection threshold of 20 mA, it is possible that a value of 0 mA is displayed due to the inaccuracies, even though a current is flowing.

| Example |
| --- |
| A current of 25 mA is flowing. The Switch Actuator detects 5 mA due to the tolerances. This value is less than the minimum current detection limit of 20 mA and is thus sent as a 0 mA value via KNX. |

Important
The current detection and monitoring function should not be used for safety-related applications. The Switch Actuator cannot assume the function of a circuit-breaker or RCD (earth-leakage circuit breaker).

If the load current detection is used for equipment fault detection that only causes a slight change of under 30 mA, mains voltage and current fluctuations due to ambient influences, e.g. temperature, natural ageing of the device or a non-sinusoidal current, play a significant role. Even when the current changes are detected by the Switch Actuator, the detected current changes do not necessarily mean that a device has malfunctioned.

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Connection schematic
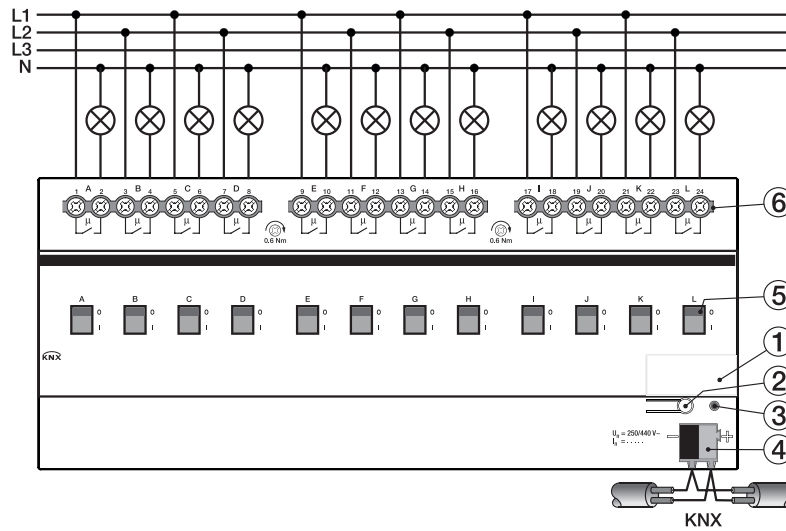
SA/S 12.16.6.1

1   Label carrier
2   *Programming* button
3   *Programming* LED
4   Bus connection terminal
5   Contact position display and manual operation
6   Load current circuits, for every 2 connection terminals
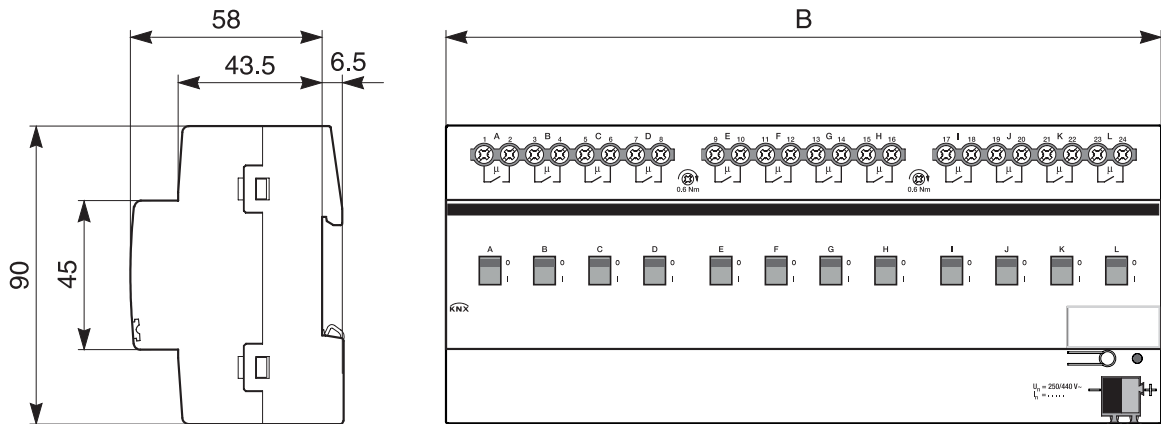
⚠️ ⚡ Danger
Touch voltages.
Danger of injury.
Observe all-pole disconnection.

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Dimension drawing

SA/S 12.16.6.1

	SA/S 2.16.6.1	SA/S 4.16.6.1	SA/S 8.16.6.1	SA/S 12.16.6.1
Width W	36 mm	72 mm	144 mm	216 mm
Mounting width	2 units	4 units	8 units	12 units
(18 mm modules)				

Contact

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