The 20 AX Switch Actuators are modular installation devices in proM design for installation in the distribution board on 35 mm mounting rails. The connection to the ABB i-bus® EIB / KNX is implemented via a screwless Bus Connection Terminal.

The 2-, 4- and 8-fold switch actuators feature a load current detection on every output. A separate external voltage supply for the actuator is not required.

The actuator switches up to 12 independent electrical loads via potential free contacts. The outputs are connected using screw terminals with combination drive head screws. Each output is controlled and monitored separately via the EIB / KNX.

The switch actuators can be manually operated via an operating element which simultaneously indicates the switch status.

The actuators are particularly suitable for switching loads with high peak inrush currents such as fluorescent lighting with compensation capacitors or fluorescent lamp loads (AX) according to EN 60669.

### Technical data

#### Power supply
- Operating voltage 21...30 V DC, made available by the bus
- Current consumption EIB / KNX < 12 mA
- Power consumption EIB / KNX Max. 250 mW

#### Output nominal values
- SA/S - type 2.20.1S, 4.20.1S, 8.20.1S, 12.20.1
- Current detection yes, yes, yes, no
- Number of contacts (potential free) 2, 4, 8, 12
- U_rated voltage 250 / 440 V AC (50/60 Hz)
- I_rated current 20 AX
- Power loss per device at max. load 3.0 W, 5.5 W, 11.0 W, 16.0 W

#### Output switching currents
- AC3 operation (cos \( \varphi \) = 0.45) EN 60 947-4-1 16 A / 230 V
- AC1 operation (cos \( \varphi \) = 0.8) EN 60 947-4-1 20 A / 230 V
- Fluorescent lighting load AX to EN 60669-1 20 AX / 250 V (140 \( \mu \)F) 2)
- Minimum switching performance 100 mA / 12 V
- DC current switching capacity (ohmic load) 20 A / 24 V DC

#### Output life expectancy
- Mechanical endurance > 10^6
- Electrical endurance to IEC 60 947-4-1 > 10^5
- AC1(240 V/cos \( \varphi \) = 0.8) > 3 x 10^4
- AC3 (240 V/cos \( \varphi \) = 0.45) > 3 x 10^4
- AC5a (240 V/cos \( \varphi \) = 0.45) > 3 x 10^4

#### Current detection (load current)
- SA/S 2.16.5S, SA/S 4.16.5S, SA/S 8.16.5S
- Detection range (sine r.m.s. value) 0.1 A ... 20 A
- Accuracy +/- 8 % of current value (sine) and +/- 100 mA
- Frequency 50/60 Hz
- Resolution 1-Byte / 2-Byte 100 mA / 1 mA
- Detection speed limited by low-pass filter with \( \tau \) 100 ms

#### Output switching times 1)
- Max. number of relay position changes per output and minute, if all relays are switched simultaneously. The position changes should be distributed equally within the minute.
- Max. number of relay position changes per output, and minute if only one relay is switched

1) The specifications apply only after the bus voltage has been applied to the device for at least 30 seconds. The typical elementary delay of the relay is approx. 20 ms.

2) The maximum inrush-current peak (see table 2) may not be exceeded

Table 1 – Part 1: 20 AX Switch Actuator SA/S x.20.1S, technical data
Switch Actuator, x-fold, 20 AX, with Current Detection, MDRC
SA/S x.20.1S, 2CDG 110 0xx R0011

Connections
- EIB / KNX
- Load current circuits (2 terminals per contact) Bus Connection Terminal, 0.8 mm Ø, single core
- Tightening torque Screw terminal with universal head (PZ 1) 0.2...4 mm² finely stranded, 2 x (0.2 – 2.5 mm²) 0.2...6 mm² single core, 2 x (0.2 – 4 mm²) Max. 0.8 Nm

Operating and display elements
- Red LED and EIB / KNX push button for assignment of the physical address
- Contact position indication Relay lever

Housing
- IP 20 to EN 60 529

Safety class
- II to EN 61 140

Isolation category
- Overvoltage category III to EN 60 664-1
- Pollution degree 2 to EN 60 664-1

EIB / KNX voltage
- SELV 24 V DC (safety extra low voltage)

Temperature range
- Operation – 5 °C... + 45 °C
- Storage – 25 °C... + 55 °C
- Transport – 25 °C... + 70 °C

Design
- Modular DIN-Rail Component (MDRC) Modular installation device, ProM
- SA/S - type 2.20.1S 4.20.1S 8.20.1S 12.20.1
- Dimensions (H x W x D) 90 x W x 64
- Width W in mm 36 72 144 216
- Mounting width (modules at 18 mm) 2  4 8 12
- Mounting depth in mm 64 64 64 64

Weight
- In kg 0.2 0.34 0.64 0.8

Installation
- On 35 mm mounting rail EN 60 715

Mounting position
- As required

Housing, colour
- Plastic housing, grey

Approvals
- EIB / KNX to EN 50 090-2-2 Certification

CE mark
- in accordance with the EMC guideline and low voltage guideline

Table 1 – Part 2: 20 AX Switch Actuator SA/S x.20.1S, technical data

Lamp loads

<table>
<thead>
<tr>
<th>Lamps</th>
<th>Incandescent lamp load</th>
<th>3680 W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluorescent lamps T5 / T8</td>
<td>Uncompensated luminaire</td>
<td>3680 W</td>
</tr>
<tr>
<td></td>
<td>Parallel compensated</td>
<td>2500 W</td>
</tr>
<tr>
<td></td>
<td>DUO circuit</td>
<td>3680 W</td>
</tr>
<tr>
<td>Low-volt halogen lamps</td>
<td>Inductive transformer</td>
<td>2000 W</td>
</tr>
<tr>
<td></td>
<td>Electronic transformer</td>
<td>2000 W</td>
</tr>
<tr>
<td></td>
<td>Halogen lamp 230V</td>
<td>3680 W</td>
</tr>
<tr>
<td>Dulux lamp</td>
<td>Uncompensated luminaire</td>
<td>3680 W</td>
</tr>
<tr>
<td></td>
<td>Parallel compensated</td>
<td>3000 W</td>
</tr>
<tr>
<td>Mercury-vapour lamp</td>
<td>Uncompensated luminaire</td>
<td>3680 W</td>
</tr>
<tr>
<td></td>
<td>Parallel compensated</td>
<td>3680 W</td>
</tr>
<tr>
<td>Switching performance (switching contact)</td>
<td>Max. peak inrush-current iₚ (150µs)</td>
<td>600 A</td>
</tr>
<tr>
<td></td>
<td>Max. peak inrush-current iₚ (250µs)</td>
<td>480 A</td>
</tr>
<tr>
<td></td>
<td>Max. peak inrush-current iₚ (600µs)</td>
<td>300 A</td>
</tr>
</tbody>
</table>

Number of electronic ballasts (T5/T8, single element) ¹
- 18 W (ABB EVG 1x58 CF) 26¹
- 24 W (ABB EVG-T5 1x24 CY) 26¹
- 36 W (ABB EVG 1x36 CF) 22
- 58 W ABB EVG 1x58 CF 12¹
- 80 W (Helvar EL 1x80 SC) 10¹

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.
² Limited by protection with a B16 miniature circuit breaker

Table 2: Lamp load for SA/S x.20.1S
Table 3: Application programs SA/S x.20.1S

<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
<th>Max. number of communication objects</th>
<th>Max. number of group addresses</th>
<th>Max. number of associations</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA/S 2.20.1S</td>
<td>Switch, 2f20S/1</td>
<td>40</td>
<td>254</td>
<td>254</td>
</tr>
<tr>
<td>SA/S 4.20.1S</td>
<td>Switch, 4f20S/1</td>
<td>76</td>
<td>254</td>
<td>254</td>
</tr>
<tr>
<td>SA/S 8.20.1S</td>
<td>Switch, 8f20S/1</td>
<td>152</td>
<td>254</td>
<td>254</td>
</tr>
<tr>
<td>SA/S 12.20.1S</td>
<td>Switch, 12f20S/1</td>
<td>220</td>
<td>254</td>
<td>254</td>
</tr>
</tbody>
</table>

Note: The programming requires the EIB Software Tool ETS2 V1.3 or higher. If the ETS3 is used a “.VD3” type file must be imported.

The application program is located within the ETS2 / ETS3 in the category ABB/output/Binary output, x-fold/switch, xf20S/1 (x = 2, 4, 8 or 12, number of outputs, S = current detection).

Detailed information about the application can be found in the product manual for the “Switch Actuators SA/S”. This manual can be free downloaded under www.abb.de/eib.
ABB i-bus® EIB / KNX

Switch Actuator, x-fold, 20 AX, with Current Detection, MDRC
SA/S x.20.S, 2CDG 110 0xx R0011

Wiring diagram

1 Label carrier
2 Programming button
3 Programming LED
4 Bus Connection Terminal
5 Contact position indication and manual operation
6 Load current circuits, per circuit 2 connection terminals

Note: All-pole disconnection must be observed in order to avoid dangerous contact voltage which can develop via loads in other phases.

Dimension drawings

<table>
<thead>
<tr>
<th></th>
<th>SA/S 2.20.1S</th>
<th>SA/S 4.20.1S</th>
<th>SA/S 8.20.1S</th>
<th>SA/S 12.20.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>36 mm</td>
<td>72 mm</td>
<td>144 mm</td>
<td>216 mm</td>
</tr>
<tr>
<td></td>
<td>2 module widths</td>
<td>4 module widths</td>
<td>8 module widths</td>
<td>12 module widths</td>
</tr>
</tbody>
</table>