

KNX S1-BA4 Multifunctional actuator

Technical specifications and installation instructions

item number 70514



1. Description

The **Actuator KNX S1-BA4** with integrated façade control has a multifunctional output which can connect to either a drive with Up/Down control (blinds, awnings, shutters, windows) or two switchable devices (On/Off for light and ventilation). Because the output is designed to be free of potential, other systems can also be controlled, e.g. via the manual switch input on a motor control unit.

Automation can be specified externally or internally. Internally, there are numerous options available for blocking, locking (e.g. master-slave) and priority definitions (e.g. manual-automatic). Scenes can be saved and called up via the bus (scene control with 16 scenes per drive).

The **KNX S1-BA4** has four analogue/digital inputs that are used as bus inputs (buttons, alarm messages etc.) or for temperature sensors T-NTC.

Functions:

- **Potential-free multifunctional output** each for a **230 V drive** (shade, window) or for connecting two **switchable 230 V devices** (light, fan) or for a **DC drive** (shade, window)
- In the AC voltage mode, **automatic runtime measurement** of the drives for positioning (including fault notification object)
- Switching of the relay in the AC mode with low wear near the zero-voltage
- Keypad with **button pair** and status LEDs
- **4 inputs** for binary contacts or temperature sensor
- **Position feedback** (movement position, also slat position for shutters)
- **Position storage** (movement position) via 1-bit object (storage and call-up e.g. via buttons)
- Parameters for taking drive and mechanics **downtimes** into account
- Control via **internal or external automation functions**
- Integrated **shade control** with **slat adjustment** for shutters based on the position of the sun
- **Scene control** for movement position with 16 scenes per drive (also slat position for shutters)
- Mutual **locking** of two drives using zero position sensors prevents collisions e.g. of shade and window (master-slave)
- **Blocking objects and alarm reports** have different priorities, so safety functions always take precedence (e.g. wind block)
- Manual or automatic **priority** setting via time or communication object
- **4 temperature switching outputs** in the application program with adjustable threshold values (presetting the parameters or communication object)
- **Brief time limit** (movement command blocked) and **2 movement limits**

Configuration is made using the KNX software ETS. The **product file** can be downloaded from the Elsner Elektronik website on www.elsner-elektronik.de in the "Service" menu.

1.1. Technical specification

Housing	Plastic
Colour	White
Assembly	Series installation on mounting rails
Protection category	IP 20
Dimensions	approx. 53 x 88 x 60 (W x H x D, mm), 3 width units
Weight	approx. 170 g
Ambient temperature	Operation -20...+70°C, storage -55...+90°C
Ambient humidity	max. 95% RH, non-condensing
Operating voltage	KNX bus voltage
Current at the bus	10 mA
Auxiliary voltage for output	DC voltage up to 24V DC or AC voltage up to 250V AC
Output	1 x output, free of potential with 2 connections for drive up/down or 2 devices. Can withstand a total of max. 4 A (resistive load)
Minimum current for runtime measurement	AC effective 200 mA
Inputs	4x analogue/digital, max. output length 10 m
Setting range for the T-NTC temperature sensor on the input	-30°C...+80°C
Data output	KNX +/- bus connector terminal
BCU type	Integrated microcontroller
PEI type	0
Group addresses	max. 1024
Assignments	max. 1024
Communication objects	200

The product is compliant with the provisions of EU guidelines.

2. Installation and start-up

2.1. Installation notes



Installation, testing, operational start-up and troubleshooting should only be performed by an electrician.



DANGER!

Risk to life from live voltage (mains voltage)!

There are unprotected live components within the device.

- VDE regulations and national regulations are to be followed.
- Ensure that all lines to be assembled are free of voltage and take precautions against accidental switching on.
- Do not use the device if it is damaged.
- Take the device or system out of service and secure it against unintentional use, if it can be assumed, that risk-free operation is no longer guaranteed.

The device is only to be used for its intended purpose. Any improper modification or failure to follow the operating instructions voids any and all warranty and guarantee claims.

After unpacking the device, check it immediately for possible mechanical damage. If it has been damaged in transport, inform the supplier immediately.

The device may only be used as a fixed-site installation; that means only when assembled and after conclusion of all installation and operational start-up tasks and only in the surroundings designated for it.

Elsner Elektronik is not liable for any changes in norms and standards which may occur after publication of these operating instructions.

2.2. Device design



Follow the guidelines and standards for SELV electric circuits while installing and cable laying of the KNX connection (no. 2) and inputs (no. 7).

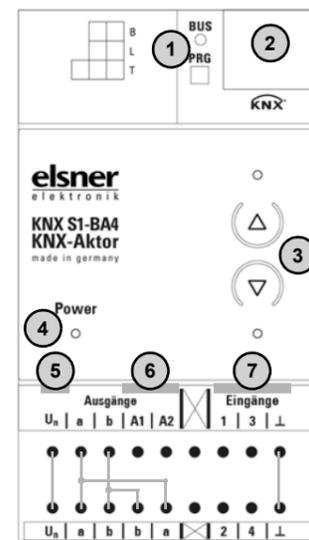


Fig. 1

- 1) Programming LED and button (PRG)
- 2) Bus terminal slot (KNX +/-)
- 3) Up/Down button pair and LEDs
- 4) LED "Operation" (Power), display of operating status, Siehe "Indication of operation mode with the Power LED" auf Seite 1.
- 5) Input auxiliary voltage U_n for outputs A1/A2.
Load capacity: maximum 4 A.
a/b connections for use with a connection of 230 V AC.
- 6) Output A1 - A2:
"Up" "Down" or "Device 1" "Device 2"
- 7) Analogue/Binary inputs 1-4 (with GND)

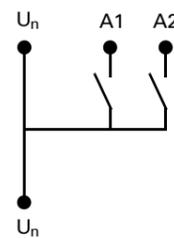


Fig. 2

Circuit diagram output (A1, A2) with voltage supply (U_n)

2.3. Connection

The device is designed for series installation on mounting rails and occupies 6 units. The connection is made using a KNX connector on the KNX data bus. In addition, a power supply for the connected drive or consumer is necessary (U_n).



ATTENTION!

Relays may be switched on when starting the device for the first time!

The bistable relays used in this product may switch on in case of shock, e.g. during transportation.

- First apply the bus voltage, as this will switch off the relays. Then switch on the voltage supply of the drive.

2.3.1. Indication of operation mode with the Power LED

Behaviour	Colour	
On	Green	Normal operation. Bus connection/bus voltage available.
Flashes	Green	Normal operation. No bus connection/bus voltage available.
On	Orange	Device starts up or is being programmed via the ETS. No automatic functions are executed.
Flashes	Green (on), Orange (flashing)	Programming mode active.

2.3.2. Status display by the channel LEDs

Behaviour	LED	
To	top	Drive in top end position/device on.
To	bottom	Drive in bottom end position/drive on.
Flashes slowly	top	Drive moves up.
Flashes slowly	bottom	Drive moves down.
Flashes quickly	top	Drive in top end position, blocking active.
Flashes quickly	bottom	Drive in bottom position, blocking active.
Flashes quickly	both simultaneously	Drive in intermediate position, blocking active.
Extend	both	Drive in intermediate position.

Behaviour	LED	
Flashes	both alternately	Automatic runtime determination error. If the drive can be moved, drive it into the end position by hand (drive in/dive out completely or open/close) in order to restart the runtime determination. If the drive cannot be moved, check the connections.
"Runlight" above all LEDs	all channels	Incorrect application version was loaded. Use the version compatible with the device!

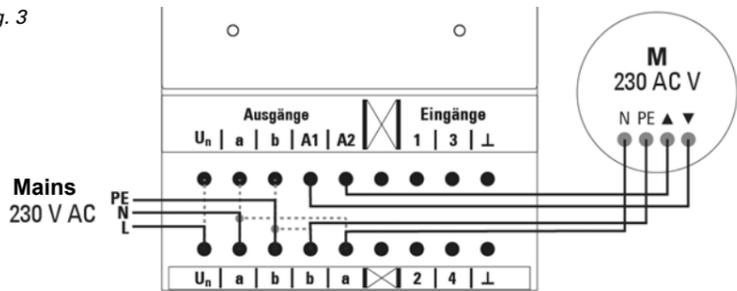
2.3.3. Connection examples

Due to the potential output, the **Actuator KNX S1-BA4** is equally suitable for use with AC (230 V AC) and DC (12 V DC, 24 V DC).

230 V drive at the output:

In this case, the "U_n" connection is used as "L". The terminals "a" and "b" are used as "N" and "PE" as shown in the connection example.

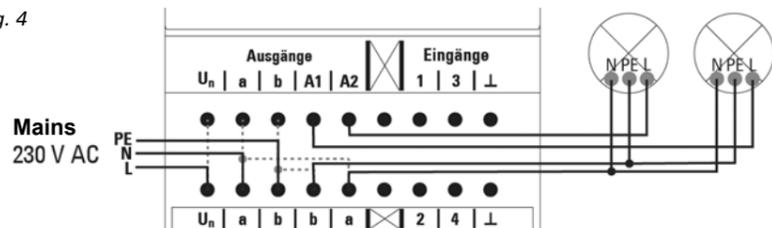
Fig. 3



Two 230V consumers at the output:

In this case, the "U_n" connection is used as "L". The terminals "a" and "b" are used as "N" and "PE" as shown in the connection example.

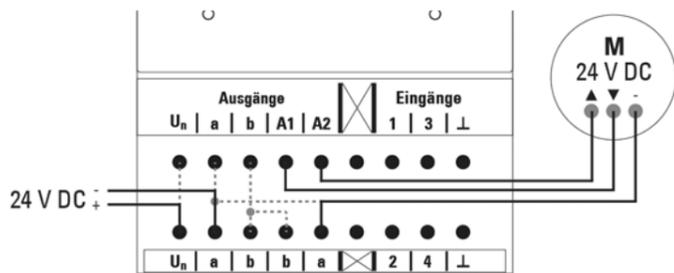
Fig. 4



24 V DC drive at the output:

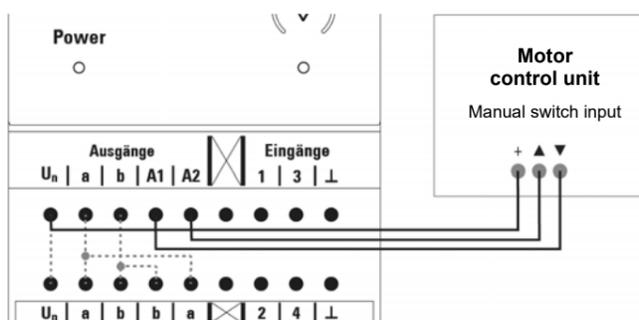
In this case, the "U_n" connection is used as "+". An automatic runtime measurement is not possible with a DC voltage supply!

Fig. 5



Control of an external motor control unit via the output:

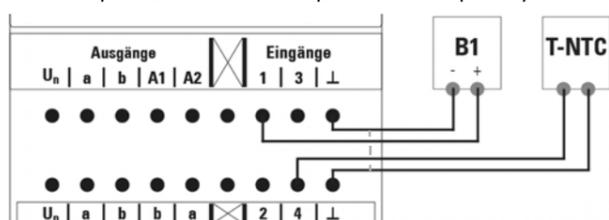
Fig. 6



Inputs:

Example with a binary contact in input 1 and temperature sensor T-NTC at input 4. The connection of the temperature sensor is independent of the polarity.

Fig. 7



2.4. Notes on mounting and commissioning

Device must not be exposed to water (rain). This could result in the electronic being damaged. A relative air humidity of 95% must not be exceeded. Avoid bedewing.

After the operating voltage has been applied, the device will enter an initialisation phase lasting a few seconds. During this phase no information can be received or sent via the bus.

For KNX devices with safety functions (e.g. wind or rain blocks), it is important to set up periodical monitoring of the safety objects. The optimal ratio is 1:3 (example: if the weather station sends a value every 5 minutes, the actuator must be configured for a monitoring period of 15 minutes).

3. Addressing of the device at the bus

The device is supplied with the bus address 15.15.250. You can program another address into the ETS by overwriting the 15.15.250 address or by teaching via the programming key.