

## Thermal drive actuator RS 510K23

**5WG1 510-2KB23**

### Product and Application Description



The RS 510K23 Thermal drive actuator is a KNX device with two switching outputs (2 x 1.5A) for control of thermal drive actuators. The device is installed in an AP 118 Control Module Box or an AP 641 Room Control Box. The bus is connected via a bus terminal block. The device electronics are supplied via the bus voltage.

This device has the following features.

Via parameters of the application program for the RS 510K23 Thermal drive actuator, you can set,

- whether the output is to be controlled by a 1-bit or an 8-bit object,
- whether the valve in the de-energized state is to be open or closed,
- up to which actuating variable value the valve is to remain closed,
- from which actuating variable value the valve is to be completely open already,
- to which least value (hysteresis) the actuating variable must be changed in order to compute a new ON or OFF time,
- which cycle time is to be included for pulse width modulation (PWM) ,
- whether the valve is to be opened once every 72 hours to avoid a blockage,
- if and under which conditions the current status shall be sent,
- which switching status the output is to assume in the event of a bus voltage failure and which after bus voltage recovery.

The devices can be configured to regularly report its functional status. Should the device not function anymore, e.g. due to a bus voltage failure, the loss of the regular status message can be captured and evaluated by a supervisory system.

Sending of all respectively configured status values can be triggered via a central object for all output channels sending. This can reduce the bus load that otherwise

would be generated by single status read requests of a superordinated system.

#### Behavior at bus voltage failure / recovery

On bus voltage failure the current switching status value of each output channel is saved for a possible restoration on bus voltage recovery.

On bus voltage recovery the configured actions are executed and, if applicable, new status values are reported.

#### Behavior on unloading the application program

When the application program is unloaded with ETS the device does not function.

#### Resetting the device to ex-factory settings

When the programming button is pressed for more than 20 seconds the device is reset to the ex-factory settings. Regular flashing of the programming LED for 8s displays this. All configuration settings are lost. The individual address is reset to 15.15.255.

#### Addressing mode

A short push of learning button (< 2 s) enables the addressing mode. This is indicated by a continuously lit programming mode LED. A second push disables this mode.

#### Application programs

The RS 510K23 Thermal drive actuator needs the application program "07 B0 A2 Thermal drive actuator 983801".

The device is configured and commissioned with the ETS (Engineering Tool Software) version ETS4 or later.

**Example of operation**

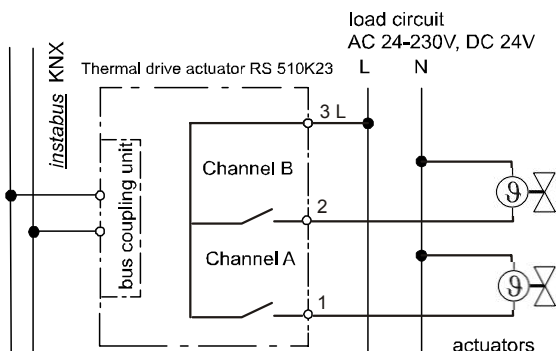


figure 1: Example of operation

**Installation instructions**

- The device is intended for installation in an AP 118 Control Module Box or an AP 641 Room Control Box.



**DANGER**

- The device must be mounted and commissioned by an authorized electrician.
- A safety disconnection of the device must be possible.
- The device must not be opened.
- For planning and construction of electric installations, the relevant guidelines, regulations and standards of the respective country are to be considered.
- **When looping through the L-conductor, take care that the maximum permissible terminal load current of 16A is not exceeded!**

**Technical Data**

**Power supply**

- via the bus line
- KNX bus voltage: DC 24V (DC 21...30V) via KNX/EIB bus line
- KNX bus current: < 10 mA

**Outputs**

- Number: 2 outputs (potential free contacts)
- rated voltage: AC 24-230V, 47 ... 63Hz  
DC 24V
- rated current: 1.5A resistive load
- switching current at AC 24-230V: 0.01 ... 1.5A resistive load
- switching current at DC 24V:
  - 1.5A resistive load
- Switching characteristic: set in parameter list according to application program

**Control elements**

1 learning button:  
for switching between normal operating mode and addressing mode  
(situated on bus connection module shipped with device)

**Display elements**

1 red LED:  
for monitoring bus voltage and for displaying normal mode/addressing mode  
(situated on bus connection module shipped with device)

**Connections**

- Bus line : Bus connection pins for connection of the screwless bus terminal block (red-black) 0.6...0.8 mm Ø single core, strip insulation 5mm
- Load circuit: screwless terminals 0.5 ... 2.5mm<sup>2</sup> single-core, stranded or multi-core, untreated, strip insulation 9 ... 10mm

**Physical specifications**

- housing: plastic
- dimensions (L x W x D): 78 x 50 x 35.5 mm
- weight: approx. 45 g
- fire load: approx. 900 kJ
- Installation: Mounting location for RS / RL module in AP 118 Control Module Box or AP 641 Room Control Box
- Thermal dissipation loss:
  - Device: 0.15 W (= min. total thermal dissipation loss)
  - per output: 0.022Ω \* I<sup>2</sup> [W]

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min. total thermal dissipation loss: 0.15 W (load: 0A)  
 max. total thermal dissipation loss: 0.25 W (load:  
 2 x 1.5A, at 100% on-time)

**Electrical safety**

- Degree of pollution (according to IEC 60664-1): 2
- Type of protection (according to EN 60529): IP 20
- Overvoltage category (according to IEC 60664-1): III
- Bus: safety extra low voltage SELV DC 24 V
- Device complies with: EN 50428

**Electromagnetic compatibility**

complies with EN 50428

**Environmental conditions**

- Climatic conditions: EN 50090-2-2
- Ambient operating temperature: - 5 ... + 45 °C
- Storage temperature: - 25 ... + 70 °C
- Relative humidity (not condensing): 5 % ... 93 %

**Reliability**

- Failure rate: 316 fit at 40°C

**Markings**

KNX, *EIB*

**CE norm**

- complies with the EMC regulations (residential and functional buildings),  
 low voltage regulations

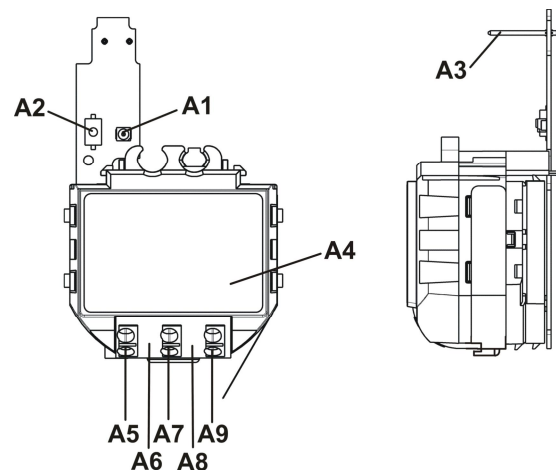
**Location / Function of the Display and Operating elements**

figure 2: Location / function of the display and operating elements

- A1 LED for indicating normal operating mode (LED off) or addressing mode (LED on); returns to normal operating mode automatically after receiving the physical address
- A2 Learning button for switching between normal operating mode and addressing mode and for receiving the physical address
- A3 Bus connection pins to connect the bus terminal block for single core conductors with 0.6...0.8 mm Ø
- A4 Type label (with space for physical address of the actuator)
- A5 Terminal Channel A
- A6 Distance plate
- A7 Terminal Channel B
- A8 Distance Plate
- A9 Terminal L

**Mounting and Connecting**

- B1 RS module
- B3 Type label
- B4 Mounting location for RS / RL module in AP 118 Control Module Box (5WG1 118-4AB01) or AP 641 Room Control Box (5WG1 641-3AB01)
- B5 Bus connection module
- B6 Insertion point for bus connection module
- B7 Snap-in point for bus connection module
- B8 Learning button
- B9 LED for indicating normal operating or addressing mode
- B10 Bus connection pins for connection of the bus terminal block
- B11 Insertion point for bus terminal block
- B12 Bus terminal block
- B14 Terminals

- Mounting of a RS module:
  - Remove the lid of the AP 118 Control Module Box respectively of the AP 641 Room Control Box.
  - AP 641: Remove the SELV (Class 2) cover
  - Insert the bus connection module (B5) in such a way into the insertion point (B6) for the bus connection module that the bus connection pins (B10) point to the insertion point for the bus terminal (B11).
  - Press the bus connection module (B5) down until it snaps into the locking position (B7).
  - Insert the RS module (B1) from the top with the terminals (B14) pointing away from the bus terminal insertion point (B11). The type label (B3) is on top.
  - Insert the bus terminal (B12) of the mounting location (B4) onto the bus connection pins (B10) of the bus connection module (B5).
  - For assignment of the Physical Address press the learning button (B8) for a maximum of 2 seconds. The addressing mode is indicated when the LED is on (B9). It returns to normal operating mode (LED Off) automatically after receiving the physical address.
  - AP641: Insert the SELV (Class 2) cover again.
  - Mount the lid again.

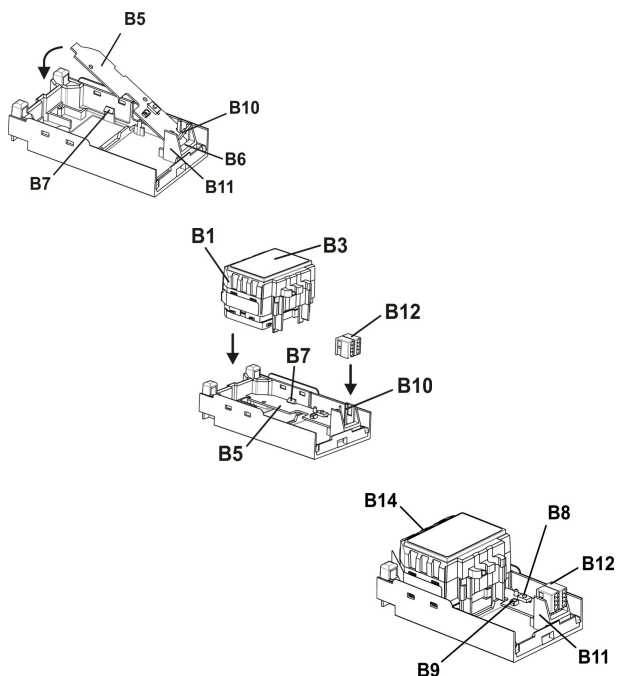


figure 3: Mounting of a RS module

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- Dismounting an RS module:
  - Remove the lid of the AP 118 Control Module Box respectively of the AP 641 Room Control Box.
  - AP 641: Remove the SELV (Class 2) cover
  - Remove the wiring from the terminals (B14).
  - Remove the bus terminal (B12).
  - To remove the RS module (B1), insert a screw driver between the module and the mounting location siding and push it up to release it from the snap-in hooks. Do this on both sides.
  - Pull the RS module (B1) from the mounting location (B4).
  - If an RL module (B2) shall be inserted into the mounting location, detach the bus connection module (B5) from the snap-in point (B7), swivel it up and pull it out of the insertion point (B6).
  - AP641: Insert the SELV (Class 2) cover again.
  - Mount the lid again.

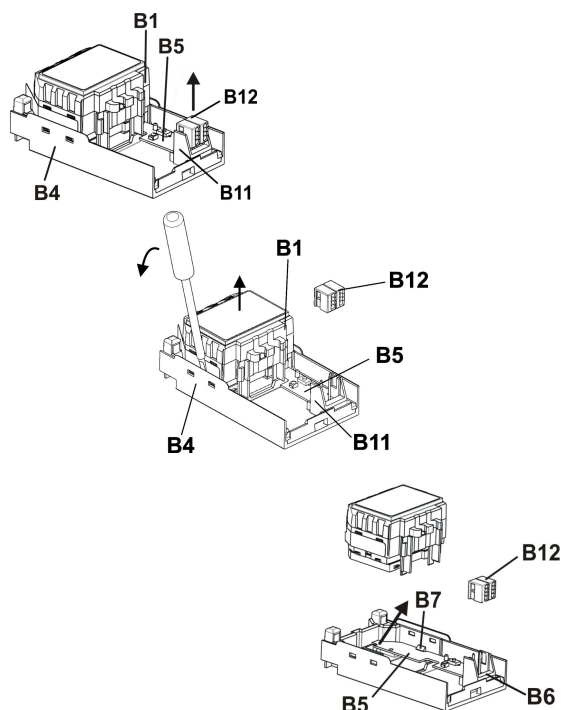


figure 4: Dismounting of a RS module

## Connecting

### Slipping off/on bus terminal blocks

The bus terminal block (C2) consists of two components (C2.1 and C2.2) with four terminal contacts each. Take care not to damage the two test sockets (C2.3) by accidentally connecting them to the bus cable or with the screw driver (e.g. when attempting to unplug the bus terminal block).

### Slipping off bus terminal blocks

- Carefully put the screw driver to the wire insertion slit of the bus terminal block's grey component (C2.2) and
- pull the bus terminal block (C2) from the module.

### Note

Don't try to remove the bus connection block from the bottom side. There is a risk of shorting-out the device!

### Slipping on bus terminal blocks

- Slip the bus terminal block (C2) onto the guide slot of the module and
- press the bus terminal block (C2) down to the stop.

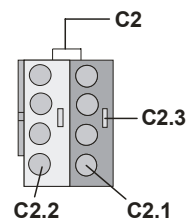


figure 5: Slipping off/on bus connection blocks

Connecting bus cables

- The bus terminal block (D1) can be used with single core conductors  $\varnothing$  0.6...0.8 mm.
- Remove approx. 5 mm of insulation from the conductor (D2) and plug it into the bus terminal block (D1) (red = +, grey = -)

Disconnecting bus cables

- Unplug the bus terminal block (D1) and remove the bus cable conductor (D2) while simultaneously wiggling it.

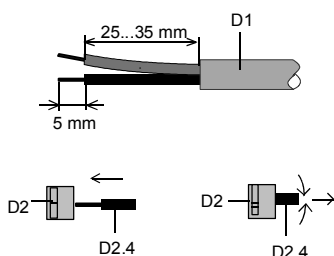


figure 6: Connecting/disconnecting bus cables

Connecting/disconnecting mains and load circuit:

Connect wires

- The load circuits are connected via screwless plug-in terminals (E1).
- Remove approx. 9...10 mm of insulation from the wire (E 1.1) and plug it into the terminal (E1).
- The terminals are designed for connection of two wires allowing to loop through the terminal block.

Note:

The maximum permissible terminal load current is 16A.

Remove wires

- Press the terminal interlocking of the terminal (F1) with a screw-driver and remove the wire (F2) from the terminal (F1).

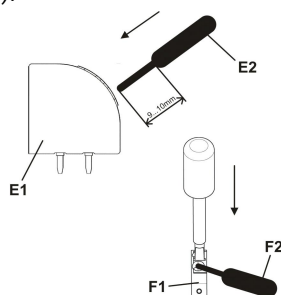
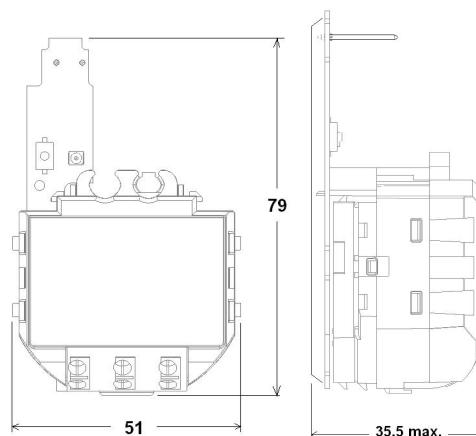


figure 7: Connecting/disconnecting mains and load circuit

**Dimension drawing**

Dimension in mm



**General Notes**

- The operating instructions must be handed over to the client.
- Any faulty device is to be sent together with a return delivery note of the local Siemens office.
- For any technical questions, please consult:
  - +49 (911) 895-7222
  - +49 (911) 895-7223
  - support.automation@siemens.com
  - www.siemens.com/automation/support-request