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GAMMA instabus | Technical product information

Switching/Dimming Actuator N 536D31, 4 x AC 230 V, 1...10 V
Switching/Dimming Actuator N 536D51, 8 x AC 230 V, 1...10 V

Main characteristics

- Control of dimmable electronic control gear (ECG Dynamic) for fluorescent lamps or LED drivers for LEDs via the DC 1...10 V control outputs
- Direct switching on and off of the AC 230 V for four or eight lamps (groups of lamps) with 4 or 8 switching contacts with a capacity of 10 AX each
- Direct operation for efficient installation with switching status display via LED.
- Maintenance-free terminals for connecting and looping through solid, stranded and fine-stranded conductors

Functions with configuration with ETS

- Extensive control, override and diagnostic functions for each channel
- Configurable dimming curves and various fade times for optimal dimming
- Control value input for analogous values can be configured as an alternative to the switching input
- Integrated 8-bit scene control and assignment of each output to up to 8 scenes
- Switching cycle counting with threshold monitoring for switching cycles
- Operating hours counter with threshold overrun warning

Type overview

Type	Description	Article number	KNX PL-Link
	Switching/Dimming Actuator N 536D31, 4 x AC 230 V, 10 AX	5WG1 536-1DB31	Yes
	Switching/Dimming Actuator N 536D51, 8 x AC 230 V, 10 AX	5WG1 536-1DB51	Yes

Characteristics

The switching/dimming actuators 536 used for switching, dimming and scene control in building automation. Device control is conducted via KNX.
The switching/dimming actuators are used to switch or dim loads using 1- to 10-volt control outputs.
A load of up to 3680 W* can be connected to each switch output of the switching/dimming actuators. To each control output of the switching/dimming actuators, ECG or LED drivers, a total of up to 94 mA* (N 536D31) or 106 mA* (N 536D31) can be connected.
The device is a rail-mounted device in N dimension for installation in arrangements and installation on 35-mm rails as per standard IEC 60715.
The bus connection of the device uses a bus terminal block. The electronics of the device are supplied via the bus voltage (no additional supply voltage required).
The maintenance-free terminals are for connecting solid, fine-stranded and stranded conductors with conductor cross-sections from 0.5 to 2.5 mm^2 on the load outputs and cross-sections from 0.5 to 1.5 mm^2 on the control outputs. Fine-stranded and stranded
can be plugged into the terminals without ferrules.
Each of the switching/dimming outputs can be assigned different functions depending on the application, i.e. switching/dimming actuator N 536 consists of the device (hardware) and the application program (software).

* Restrictions for rated current (device) and derating information for N 536D31:

- 16 A resistive in switching actuator mode; dimmer current = 0 mA; independent of installation position and temperature
- 10 AX in switching/dimming actuator mode; dimming current = 106 mA with standard installation position and + 25 °C
- 10 AX in switching/dimming actuator mode; dimming current = max. 84 mA with standard installation position and + 45 °C

* Restrictions for rated current (device) and derating information for N 536D51:

- 16 A resistive in switching actuator mode; dimmer current = 0 mA; independent of installation position and temperature
- 10 AX in switching/dimming actuator mode; dimming current = max. 94 mA with standard installation position and + 25 °C
- 10 AX in switching/dimming actuator mode; dimming current = max. 74 mA with standard installation position and + 45 °C

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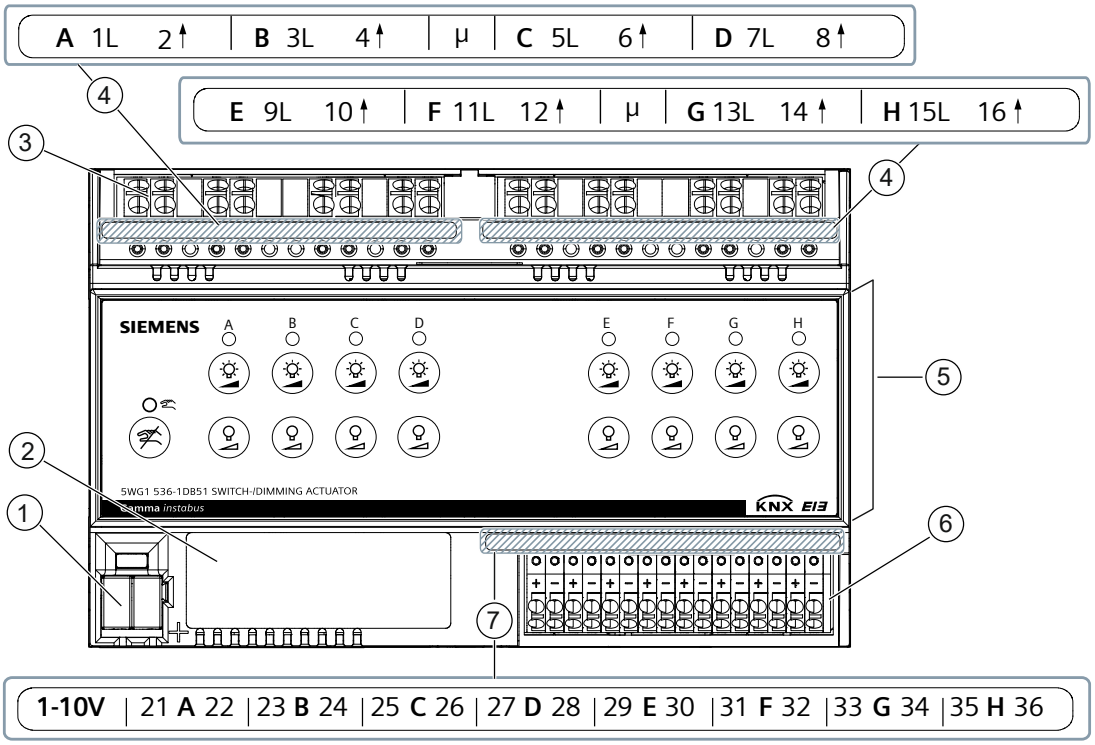
Position and function of the connections and labeling



Example graphic: 8 switching/dimming outputs

Pos.	Element	Function
1	KNX bus terminal blocks, screwless	Connect KNX bus
2	Label field	Enter physical address
3	Connection terminals of the switching contacts	Connect input and loads
4	Labelling of switching contacts for the channels	
5	Membrane keypad	Execute direct operation Show switching status of the switching/dimming actuator
6	Connection terminals of the control outputs	Connection of electronic control gear
7	Labelling of the control outputs	

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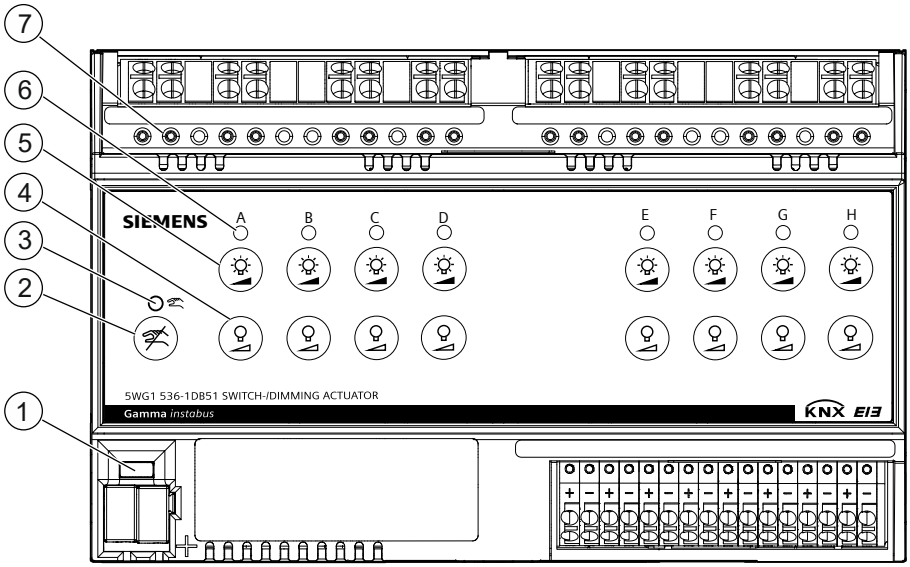

Example graphic: 8 switching/dimming outputs

Pos.	Operating or display elements	Function
1	LED (red) Button: Learning mode	Short press of button (< 2 s): → Activate learn mode, display status (LED on = active) Very long press of button (> 20 s) → Reset to delivery state (LED starts blinking after 20 s)
2	Button: Deactivate direct operation	Deactivate direct operation for all channels
3	LED (yellow): Direct operation active	LED flashes if direct operation is active for at least one channel.
4*	Button: Switch off, Dim darker Channel A	Short press of button (< 1 s): → **Switch off** channel A and → Activate direct operation for channel A Long press of button (> 1 s): → Dim channel A darker and → Activate direct operation for channel A
5*	Button: Switch on Dim brighter Channel A	Short press of button (< 1 s): → **Switch on** channel A and → Activate direct operation for channel A Long press of button (> 1 s): → Dim channel A brighter and → Activate direct operation for channel A
6*	LED (red): Channel A	LED lit: Channel switched on (dimming value > 0). LED off: Channel switched off (dimming value = 0). LED lights up with brief interruptions: Channel switched on in direct operation. LED flashing: Channel switched off in direct operation.
7*	Test contacts	Metering point for voltage testing

*The description of positions 4, 5, 6 and 7 applies analogously to the corresponding buttons/LEDs and test contacts of channels B, C, D, E, F, G and H, if available.

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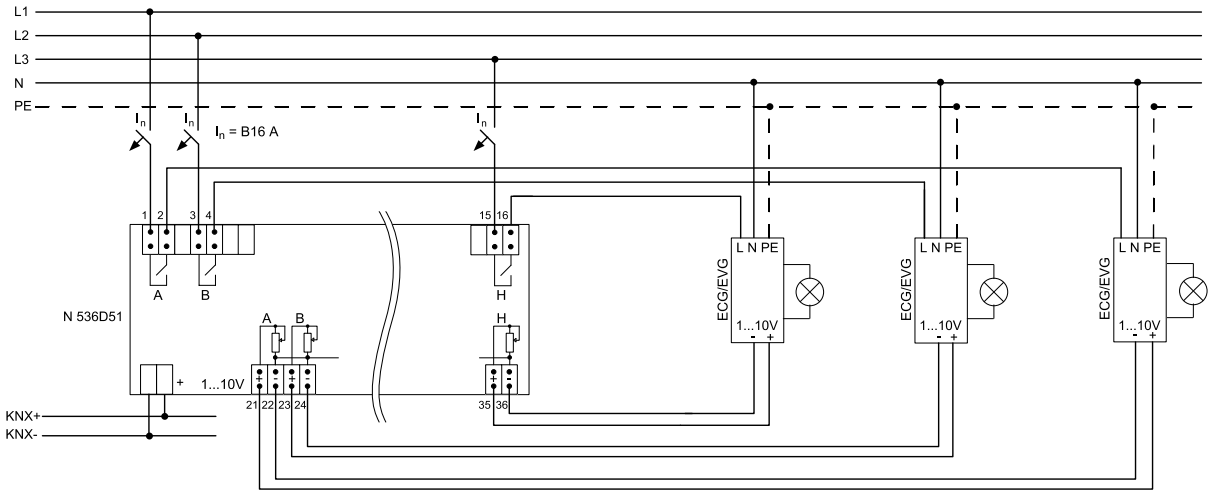
Connection example

The following connection example shows the connection of 3 dimmable electronic control gear (ECG Dynamic) for fluorescent lamps or LED drivers for LEDs via the DC 1- to 10-V control outputs of channels A, B and H. In addition to that, the lamps are connected to the switching contacts of channels A, B and H for direct switching.



Example graphic: 8 switching/dimming outputs

Technical data

Type	N 536D31	N 536D51
Power supply		
KNX bus voltage	DC 24 V (DC 21...30 V)	DC 24 V (DC 21...30 V)
KNX bus current	20 mA	25 mA
KNX power loss (internal consumption):	0.24 W	0.24 W

Type	N 536D31	N 536D51
Number of load relays (bi-stable relays, potential-free)	4	8
Contact voltage		
Rated voltage	230 V AC	230 V AC
Contact current		
Rated current, AC (resistive load)	16 A	16 A
Maximum inrush current (t = 150 s)	400 A	400 A
Maximum inrush current (t = 250 s)	320 A	320 A
Maximum inrush current (t = 600 s)	200 A	200 A
AC1 operation (cosφ= 0.8)	16 A	16 A
Fluorescent lamp load AX	10 A	10 A

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Type	N 536D31	N 536D51
Service life		
Mechanical lifespan	1,000,000 switch cycles	1,000,000 switch cycles
Electrical lifespan	100,000 switch cycles	100,000 switch cycles
Power loss		
Maximum power loss per device at rated output	7 W	12 W
Maximum power loss per channel for each device	1.75 W	1.5 W
Switching capacities/load types, loads		
Resistive load*	3680 W	3680 W
Minimum switching capacity	12 V 100 mA	12 V 100 mA
Maximum DC1 breaking capacity	24 V 10 A	24 V 10 A
Maximum capacitive load	140 µF	140 µF
Incandescent lamps		
Incandescent lamp*	2500 W	2500 W
Halogen lamp 230 V*	2500 W	2500 W
NV halogen lamp with conventional transformer (inductive)	500 W	500 W
Fluorescent lamps T5/T8		
Uncompensated	2300 VA	2300 VA
Parallel compensated (at max. possible C)	1300 W	1300 W
DUO switching	2300 VA	2300 VA
Compact fluorescent lamp		
Uncompensated	1600 VA	1600 VA
Parallel compensated (at max. possible C)	1100 W	1100 W

Type	N 536D31	N 536D51
Outputs (control outputs, 1...10 V)		
Number of control voltage outputs DC 1...10 V (passive)	4	8
Behavior at bus voltage failure	Max. brightness	Max. brightness
Maximum current per control output*	106 mA	94 mA
Max. number of ECGs or LED drivers (2 mA per ECG)*	53	47
Maximum line length, at maximum permissible power (line cross-section 0.8 mm^2)	70 m	70 m
Maximum line length, at maximum permissible power (line cross-section 1.5 mm^2)	100 m	100 m

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Type	N 536D31	N 536D51
Physical specifications		
Housing material	Plastic	Plastic
Dimensions	Rail-mounted device in N dimension See dimension drawing	Rail-mounted device in N dimension See dimension drawing
Weight	279 g	485 g
Fire load	6 MJ	9 MJ

Environmental conditions	
Ambient temperature in operation	-5 °C...+45 °C
Storage temperature	-20 °C...+70 °C
Transport temperature	-25 °C...+70 °C
Rel. humidity (non-condensing)	5 %...95 %
Environmental category (as per EN 60721-3-3)	EN 50428

Protection settings	
Degree of pollution (according to IEC 60664-1)	2
Overvoltage category (according to IEC 60664-1)	III
Protection class (according to EN 60529)	IP 20
Electrical safety, bus	Safety extra low voltage SELV DC 24 V
Electrical safety, device complies with	EN 50428
EMC compatibility	EN 50428

Type	N 536D31	N 536D51
Reliability		
Failure rate (at 40°C)	561 fit	824 fit

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- 10 AX in switching/dimming actuator mode; dimming current = max. 84 mA with standard installation position and + 45 °C

* Restrictions for rated current (device) and derating information for N 536D51:

- 16 A resistive in switching actuator mode; dimmer current = 0 mA; independent of installation position and temperature
- 10 AX in switching/dimming actuator mode; dimming current = 94 mA with standard installation position and + 25 °C
- 10 AX in switching/dimming actuator mode; dimming current = max. 74 mA with standard installation position and + 45 °C

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Functions

Building site function

The building site function provided ex-factory enables switching the building site lighting on and off via bus wall switches and actuators, even if these devices have not yet been commissioned with the Engineering Tool Software (ETS).

Direct operation via the membrane keypad

After installation, the individual channels of the device can be tested directly on the device. Prior configuration via the software is not necessary for this.
In the delivery state, direct operation is activated without a time limit.
After configuration, direct operation is limited to the configured time limit.

Resetting the device to factory settings

A very long push of the programming button of more than 20 seconds resets the device to its factory settings. This is indicated by an even flashing of the programming LED with a duration of 8 seconds. All configuration settings are deleted. The building site function of the delivery state is re-activated.

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Functions with configuration with ETS

Version of the Engineering Tool Software and application program

Application	Version
Engineering Tool Software (ETS)	ETS 4.2 or above

Behavior with bus voltage failure/recovery

When bus voltage is lost, the current switch status and dimming value status are permanently saved. On bus voltage recovery, these values can be restored. For each channel, the configured actions are also executed and, if applicable, new status values are reported.

Behavior on unloading the application program

After "unloading" the application program with the ETS, the unloaded device has no functions.
A very long push of the programming button of more than 20 seconds resets the device to its factory settings.

Timer functions

When configuring the device with ETS, two different timers and night mode can be programmed. It is possible to set delayed switching on/off and a warning before switching off occurs.

Overrides

Up to seven different override function blocks can be activated via ETS to override the automation functions.

Switch cycle and operating hours count

To monitor use, with the right configuration it is possible to count and display the switch cycles and operating hours of the device.

8-bit scene control

Using 8-bit scene control, current brightness values or switching states can be assigned to a scene and activated again later through the scene.

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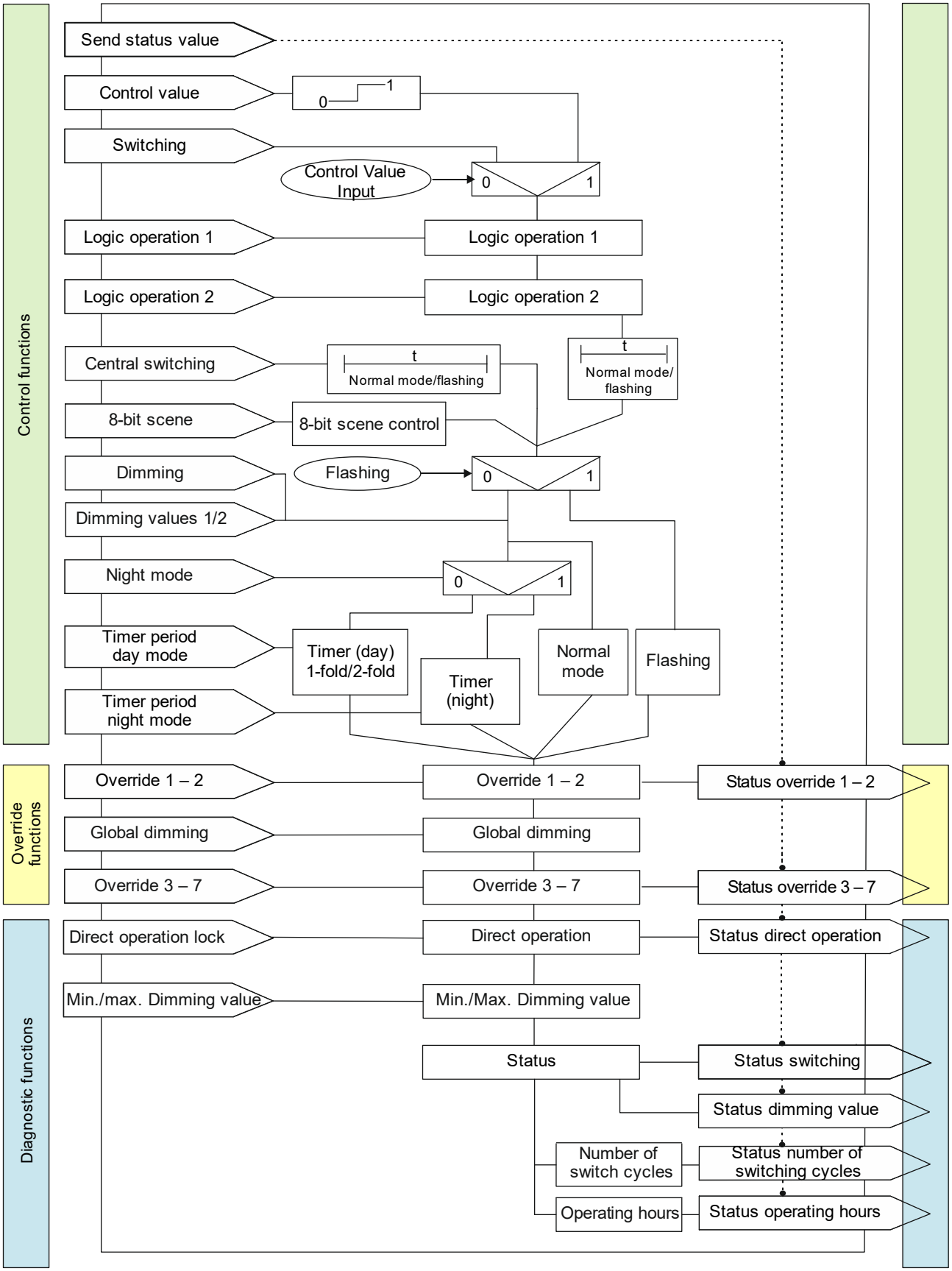
Schematic design of a switching/dimming actuator channel

The following diagram shows the functions of a channel of the switching/dimming actuator in a logical context.



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Notes

Security

WARNING

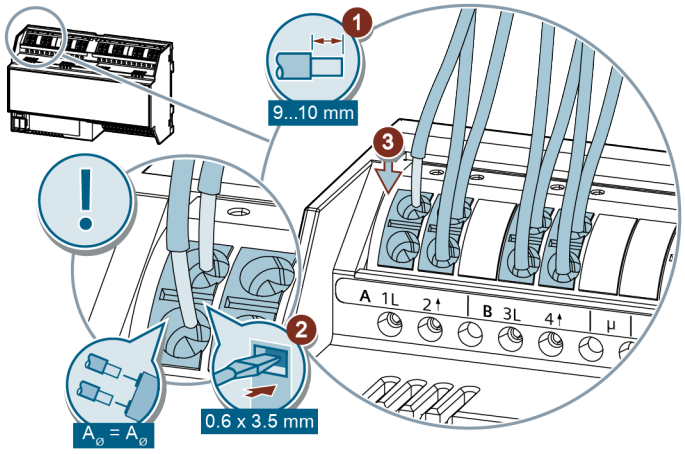
- The switching/dimming actuator should only be installed and put into operation by a certified electrician.
- Ensure that the switching/dimming actuator can be activated.
- Do not open the casing of the switching/dimming actuator.
- Secure each phase with a B16 line protection switch.
- Only use loads that are approved for dimming operation.
- Only use conventional transformers that comply with the relevant standards and contain a thermal fuse.
- For planning and construction of electric installations, the relevant guidelines, regulations and standards of the respective country are to be considered.

Note on installation

The switching/dimming actuators can be used for fixed installations in interior spaces, for dry locations, within distribution boards or small casings with DIN rail EN 60715-TH35.

Commissioning

Connecting loads to the switching contacts



Cu	A_Q
	0.5 ... 2.5 mm²
	2.5 mm²

Example graphic: 8 switching/dimming outputs

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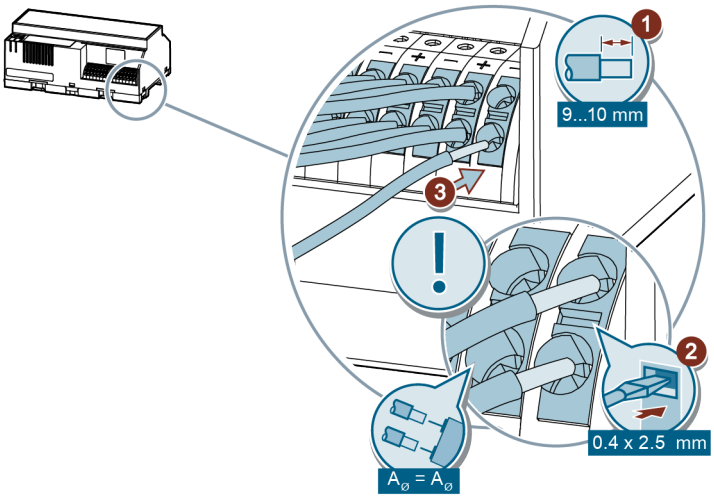
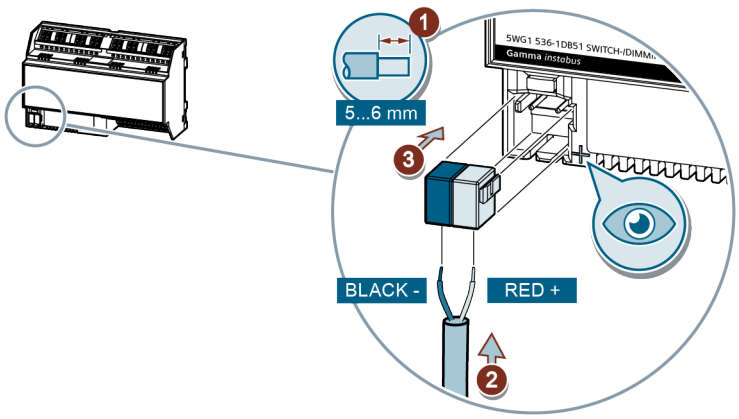
Connecting loads to the control outputs



Cu	A_Q
	0.5 ... 1.5 mm²

Example graphic: 8 switching/dimming outputs

Connecting KNX



Cu	
	0.6 – 0.8 mm

Example graphic: 8 switching/dimming outputs

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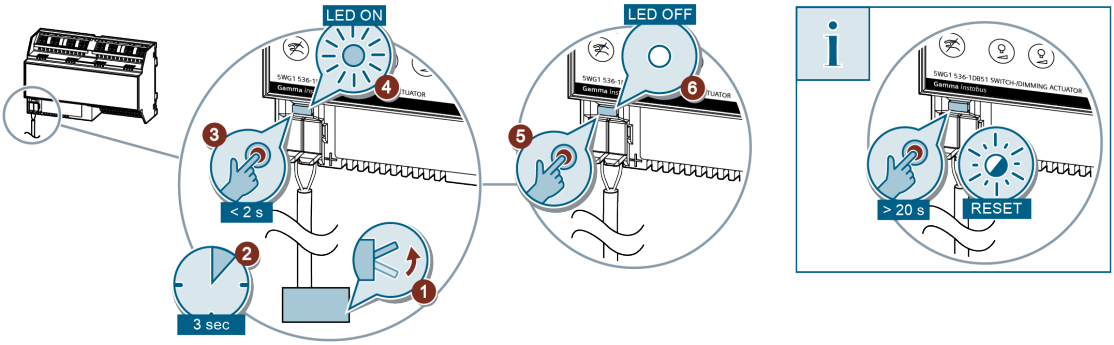
Test of KNX 24 V DC type SELV

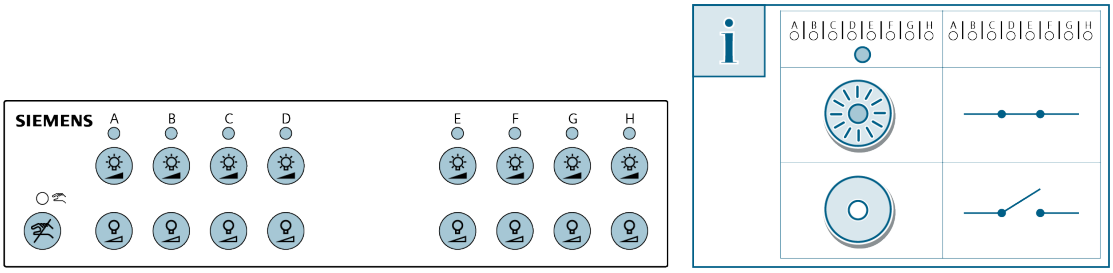
This test can be used to check whether the bus connection cable is connected with the correct polarity and whether device is supplied with bus voltage.



Example graphic: 8 switching/dimming outputs

A very long push of the programming button of more than 20 seconds resets the device to its factory settings.

Operation in direct operation (A|B|C|D|E|F|G|H U_n~ 230 V; 1...10 V)



Example graphic: 8 switching/dimming outputs

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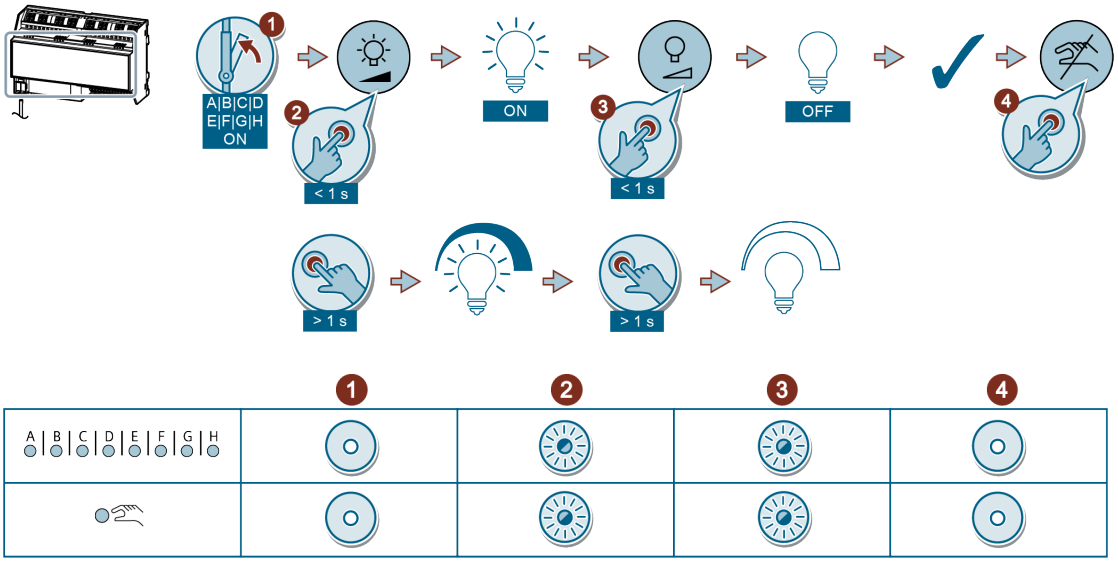
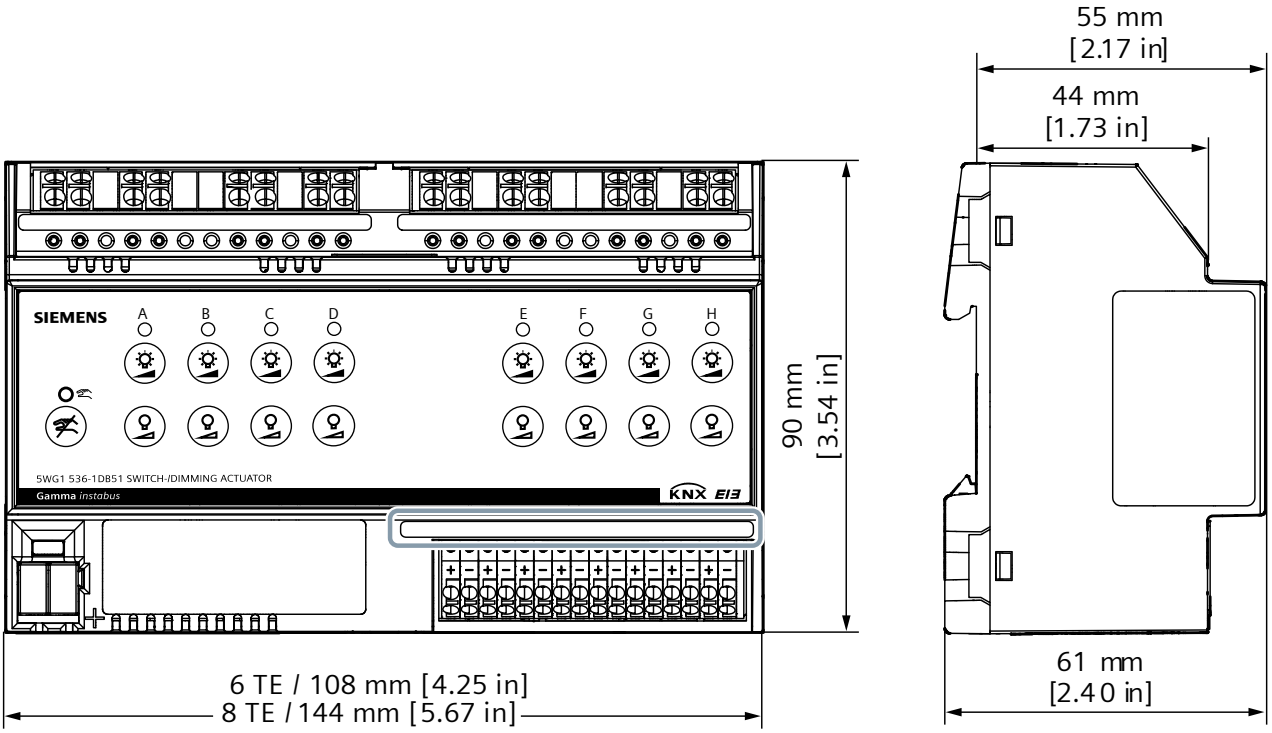
Function test of the installation

This test can be used to check whether the consumers of the channels have been connected correctly.



Example graphic: 8 switching/dimming outputs

Dimensions



Example graphic: 8 switching/dimming outputs

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Product documentation

Associated documents such as the operating and installation instructions, application program description, product database, additional software, product image, CE declaration etc. can be downloaded from the following internet address:

http://www.siemens.com/gamma-td

Support

- Provision of operating/installation instructions
- Return a defective device to the appropriate sales office.
- Contact details for technical support in case of additional questions relating to the product:
  ☏ +49 911 895-7222
  🖷 +49 911 895-7223
  ✉ support.automation@siemens.com
  http://www.siemens.com/supportrequest

Technical Support:
http://www.siemens.com/supportrequest

FAQ:
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