

## Universal dimmer, 1-fold

UP 525S32



**Universal dimmer UP 525S32 is used as a combined device with binary inputs and dimming output for switching and dimming dimmable lamps and LEDs in building automation. Device control is conducted via KNX.**

- Universal dimmer with one output for switching and dimming resistive (R), inductive (L) or capacitive (C) loads, including LED
- Automatic or manual adjustment of the dimming principle matching the load – protection against open-circuit operation, short circuit and over temperature
- 3 binary inputs for potential-free contacts to determine the switching state when conventional buttons, switches, windows/door contacts or corresponding sensors are connected
- Flexible installation concept with flush-mounting installation as main installation type and additional installation on a mounting rail in the electrical distributor or surface mounting in false ceilings, parapet ducts, and floor tanks using a mounting case

### Functions for configuration with ETS:

- Encrypted telegram transmission via KNX Data Secure
- Flexible and powerful applications with binary inputs and dimming output in one device

## Characteristics

The universal dimming actuator operates according to the leading or trailing edge dimming principle and enables switching and dimming of incandescent lamps, HV halogen lamps as well as LV halogen lamps with conventional transformers and Tronic transformers as well as dimmable HV LEDs and LV LEDs with electronic or conventional transformers.

Provided it supports the load, the characteristic of the connected load can be automatically measured and a suitable dimming process can be set. Alternatively, a fixed dimming process can be configured by setting ETS parameters. This procedure is required for loads that do not enable automatic measuring. A dimming output is available.

The device enables a switching and brightness state response of the connected load to the KNX. A short circuit and load failure can also be reported to the KNX.

Aside from the dimming output, the device has 3 additional inputs. Potential-free switches, pushbuttons or other contacts (e.g. magnetic contacts) can be connected to these inputs. The signals of the inputs are read in via a common reference potential at the device. Depending on how the ETS is configured in the application for switches, pushbuttons or contacts, inputs 1 and 2 either act internally on the dimming output or separately on the KNX bus. Input 3 always acts on the KNX bus if required. When acting internally, inputs 1 and 2 directly operate the dimming output in a specified configuration. When acting on the KNX, telegrams for switching or dimming, for blind control or value transmitter application (dimming value transmitter, light scene extension unit, color or color temperature value transmitter) can be sent individually from the inputs.

In addition to the dimming mode and the inputs, the device has 8 internal logic functions for realizing simple or complex logic operations.

The electronics of the device are supplied via the bus voltage (no additional supply voltage required).

The screw terminals on the device are designed for connecting untreated solid conductors, flexible conductors without ferrules 0.5 to 4 mm<sup>2</sup> and flexible conductors with ferrules 0.5 to 2.5 mm<sup>2</sup>. The KNX connection and the 3 binary inputs are connected via a preassembled control line YY6x0.6.

The device is designed for installation in suitable device boxes (recommendation: electronic device box with partition).

The device is KNX Data Secure-enabled. KNX Data Secure protects the building automation systems against manipulation and can be configured in the ETS project. For secure commissioning, it is mandatory that a device certificate be affixed to the device. As part of the installation process, the device certificate must be removed from the device and kept in a safe place.

The device can be updated. Firmware updates can be conveniently installed using the Siemens firmware download tool.

## Functions

### Building site function

With the actuator's factory settings, the device behaves passively, i.e. no telegrams are sent to the KNX. The output is set to the universal dimming principle with automatic detection of the load type. The output can be controlled via inputs 1 (ON/brighter) and 2 (OFF/darker), provided that the bus voltage is switched on. Input 3 has no function.

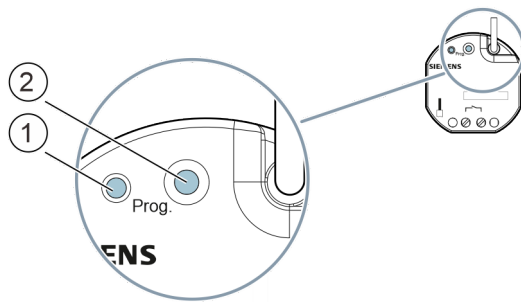


Fig. 1: Programming button and programming LED (exemplary illustration)



After bus voltage recovery, wait several seconds before pushing the programming button (2) (not until booting is complete).

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### Activate programming mode

- a) Briefly press the programming button (2) (< 1 s).
- ⇒ Programming mode is activated.
  - ⇒ The programming LED (1) illuminates continuously.

### Deactivating programming mode

- ✓ Programming mode is activated. The programming LED (1) illuminates continuously.
- a) Briefly press the programming button (2) (< 1 s).
- ⇒ Programming mode is deactivated.
  - ⇒ The programming LED (1) is not illuminated.

### Behavior on bus voltage failure/recovery

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In the event of a bus voltage failure, the current status and other values for each input and the dimming channel are permanently saved so that they can be restored when the bus voltage is recovered.

### Binary inputs

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- Depending on how the ETS is configured in the application for switches, pushbuttons or contacts, inputs 1 and 2 either act internally on the relay output or separately on the KNX bus. Input 3 always acts on the KNX if required.
- Individually adjustable functions for the inputs with effect on the KNX (switching, dimming, shutter, value transmitter, scene extension unit, 2-channel operation, controller extension unit, no function)
- Switching: Command when closing and opening the contact adjustable (no reaction, ON, OFF, TURN). The behavior after bus voltage recovery can be preset.
- Dimming: Dimming of brightness and/or color temperature. Command when closing the contact, time between switching and dimming, dimming in different steps, telegram repetition in case of long signal at the input and sending of a stop telegram at the end of the dimming process configurable, presetting of the behavior after bus voltage recovery possible.
- Shutter: The command when closing the contact and operating concept is configurable. Times for short and long signal at input and slat adjustment adjustable, behavior after bus voltage recovery can be preset.
- Value transmitter: Can function as 1-byte, 2-byte, 3-byte or 6-byte value transmitter incl. color temperature and color value transmitter; individually configurable values, optional value adjustment with long signal at input (not with 6-byte value transmitter) and presetting of behavior after bus voltage recovery is possible.
- Scene extension unit: Adjustable function (without or with memory function) and the scene number

- 2-channel operation: When closing the contact on the input, up to two telegrams can be sent to the KNX. Adjustable operating concept (channel 1 only or channel 2/both channels). The functions of the channels (1-bit, 1-byte, 2-byte, 3-byte, 6-byte) can be configured separately.
- Controller extension: Configurable functions (operating mode switching, forced operating mode switching, presence function and setpoint shift)
- Blocking of all or individual inputs via a 1-bit object possible, polarity of the blocking object, behavior at the beginning and end of the blocking and behavior during an active blocking adjustable

### **Dimming output**

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- Switching and dimming of the dimming output
- Central control function via up to 6 switching objects, 6 dimming objects and 6 value objects and collective feedback
- Switching response: active (sending on change or cyclically to the bus) or passive (object can be read) response function
- Adjustable reaction on bus voltage failure/recovery and after an ETS programming operation
- Logical link function for the output
- Configurable blocking function for the output, alternatively configurable forced position function for the output
- Time functions (switch-on, switch-off delay, staircase lighting function - also with pre-warning function)
- Can be integrated into light scenes: Up to 64 configurable internal scenes
- Operating hours counter can be activated for the output

### **Logic functions**

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- The device has 8 internal logic functions: in addition to the switching operation and inputs
- Logic gates (e.g. AND, OR, exclusive OR, each with up to 4 inputs)
- 1-bit-to-1-byte converter with input filter, blocking object and specification of output values
- Blocking element with filter and time functions and blocking object
- Comparator for values with 9 different input data formats and many comparison operations
- Limit switch with hysteresis with upper and lower threshold value for 9 different input data formats. Incl. setting the 1-bit output values
- The logic functions have dedicated KNX communication objects and can process telegrams from the actuator or other bus devices

Position and function of the connections, operating and display elements

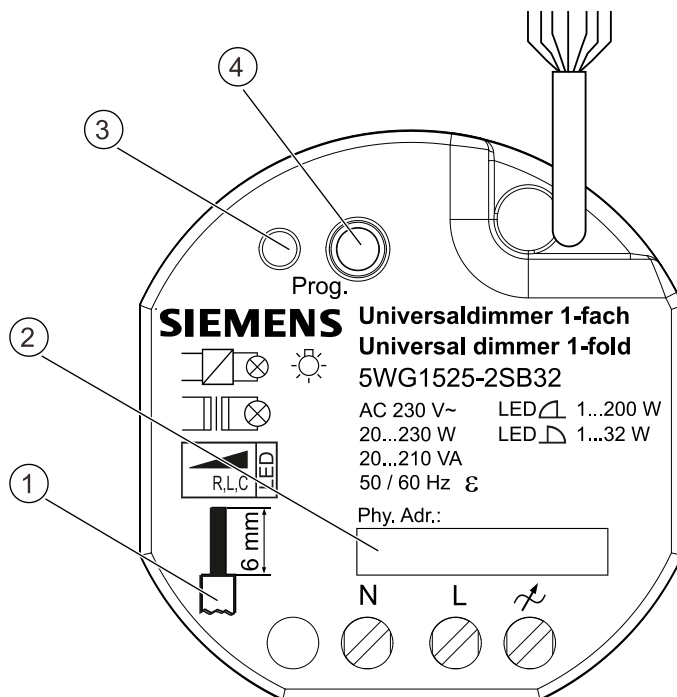



Fig. 2: Connections, operating and display elements


Pos.	Operating or display elements	Function
1	Note on cable insulation	Stripping length 6 mm
2	Label field	Enter physical address
3	Programming LED (red)	LED on = programming mode active
4	Programming button	Short push of button (< 1 s): <ul style="list-style-type: none"> <li>• Activate programming mode, display state (LED on = active)</li> </ul>

Type overview

Type	Description	Article number	KNX PL-Link
	Universal dimmer UP 525S32	5WG1525-2SB32	No

Version of the Engineering Tool Software

Application	Version
Engineering Tool Software (ETS)	ETS5 version 5.7.3 or higher

Type	Description	Article number
	Mounting case M 592/01	5WG1592-8AB01

**Product documentation and support**

**Product documentation**

Documents related the product, such as operating and installation instructions, application program description, product database, additional software and CE declarations can be downloaded from the following website:

<https://www.siemens.com/gamma-td>



**Frequently asked questions**

For frequently asked questions about the product and their solutions, see:

<https://support.industry.siemens.com/cs/products?dtp=FAQ&mf=ps&lc=de-WW>



**Support**

Contact details for additional questions relating to the product:

**Tel.:** +49 911 895-7222

**Fax:** +49 911 895-7223

**Email:** [support.automation@siemens.com](mailto:support.automation@siemens.com)

<http://www.siemens.com/supportrequest>



## Security

**⚠ CAUTION****National safety regulations**

Failure to comply with national safety regulations may result in personal injury and property damage.

- Observe national provisions and comply with the appropriate safety regulations.



- The device should only be installed and put into operation by a certified electrician.
- When connecting the device, ensure that the device can be enabled.
- Do not open the casing of the device.
- Secure the phases with a B16 line protection switch.
- Only use loads that are approved for dimming operation.
- For planning and construction of electric installations, the relevant guidelines, regulations and standards of the respective country are to be considered.
- Do not connect DC or AC voltage to the inputs of the potential-free contacts (as this damages/destroys the device and leads to voltage carry-over to the bus).
- Ensure safe separation from hazardous voltages when connecting the floating contacts.
- Install the device in a location that is inaccessible to non-professionals (e.g. flush-mounted box, sill duct, control cabinet).

Incorrect installation can deactivate electrical safety features without this being apparent to a lay person.



If you pass on the device, ensure you also pass on the documentation for the device, such as, the operating instructions.

Connecting loads to the dimming contact

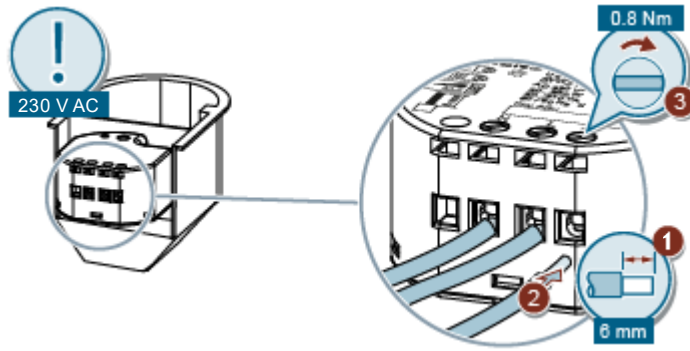
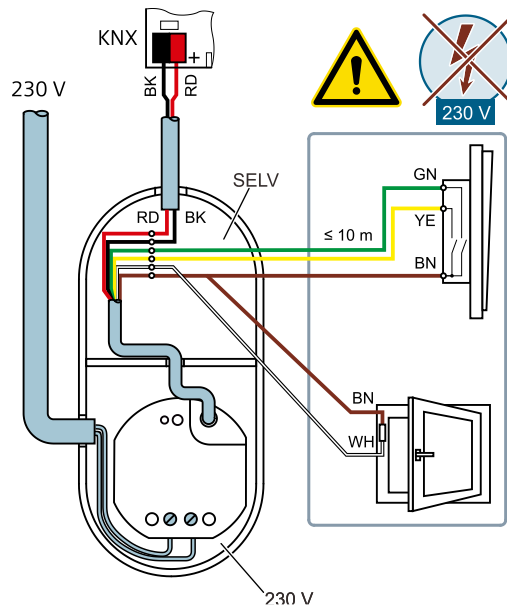


Fig. 3: Connecting loads to the dimming contact

Cu		
	0.5 ... 4.0 mm <sup>2</sup>	
	0.5 ... 2.5 mm <sup>2</sup>	

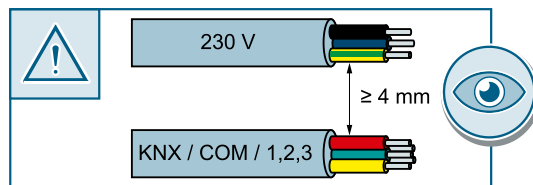


## Connecting the contacts to the binary input and KNX connection

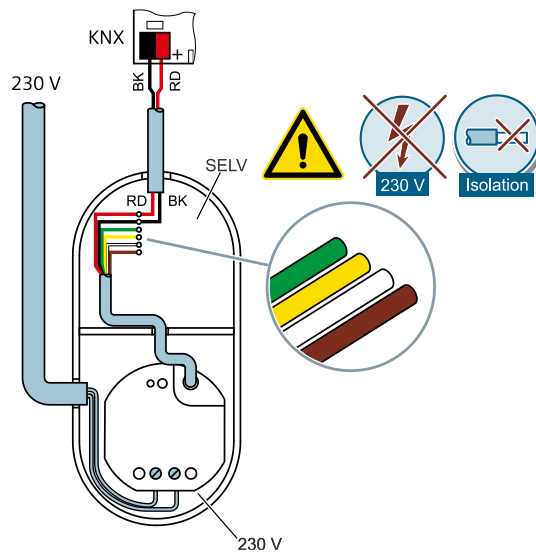


### **⚠ DANGER!**

Never connect mains voltage (230 V) or other external voltages to the extension inputs. Connecting an external voltage jeopardizes the electrical safety of the entire KNX/EIB system (SELV/no galvanic isolation)! Persons may be exposed to danger, equipment and facilities may be destroyed.



Ensure a distance of at least 4 mm between the low voltage lines (bus and extension inputs) and the load lines (230 V).



### **⚠ DANGER!**

- Do not insulate any of the wires of the 6 pole connection line against each other and against external voltages.
- Never connect input 1 (green), input 2 (yellow), input 3 (white) or reference potential (com) (brown) to inputs or reference potential (com) of other devices.
- Never place bus/binary input and mains voltage terminals together in a the same connection box. Use a device socket with a rigid partition or separate device sockets (recommendation: electronic device box with partition). Observe cable routing and spacing.

## Testing 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.

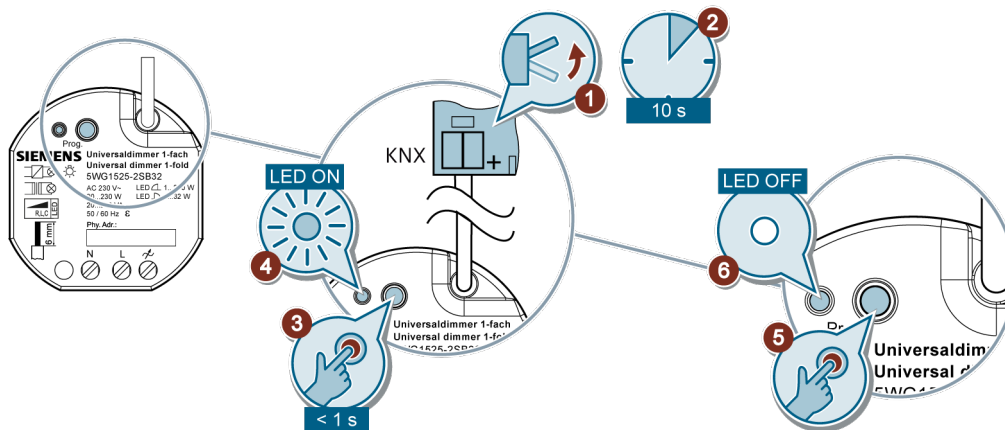


Fig. 4: Test KNX 24 V DC type SELV

## Safe-state mode

Safe-state mode stops the execution of the application program that has been loaded.



Only the system software of the device is still running. ETS diagnostic functions and programming of the device are possible

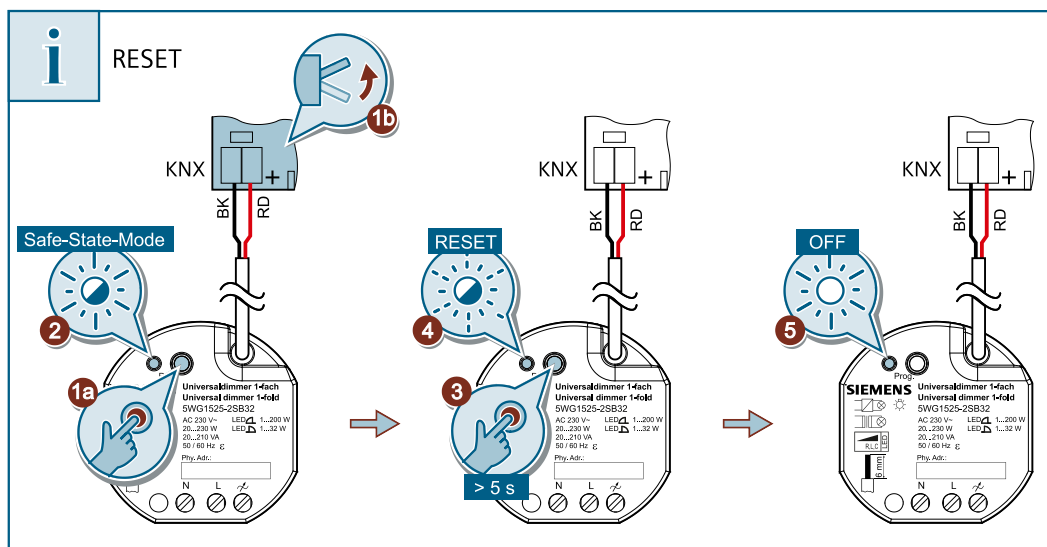


Fig. 5: Execute safe-state mode and master reset

## Activating safe-state mode

- Switch off bus voltage or disconnect device from the KNX.
- Wait approx. 10 s.
- Press and hold down the programming button (1a).
- Switch on the bus voltage or connect device to KNX (1b).
- Release the programming button only once the programming LED is flashing slowly (2).  
⇒ Safe-state mode is activated.

Briefly pressing the programming button again switches programming mode on and off just like in safe-state mode. If programming mode is active, the programming LED no longer flashes.

## Deactivate safe-state mode

- a) Switch off bus voltage or disconnect device from the KNX.
- b) Wait approx. 10 s or execute ETS programming operation.
  - ⇒ Safe-state mode is deactivated.

## Master reset

The master reset resets the device to the original settings (physical address 15.15.255, firmware is left alone). The device must then be restarted with the ETS.

In secure mode: A master reset deactivates the device safety. The device can then be restarted with the device certificate.

## Perform master reset

- ✓ Safe-state mode is activated.
- a) Press and hold the programming button for > 5 s (3).
  - ⇒ The programming LED flashes rapidly (4).
  - ⇒ The device executes a master reset, restarts and the LED turns off (5).
  - ⇒ The device is ready for operation again after approx. 5 s.

## Location of the device certificate QR code

The ETS requires the appropriate device certificate for secure commissioning. The device certificate is a string containing the device specific key FDSK (Factory Default Setup Key) and the serial number of a KNX data-secure enabled device. The certificate must be communicated to the ETS.

The FDSK is a factory unique string for each secure device. It is used one time by the ETS to generate additional (digital) keys (tool key/runtime key) for secure communication within the project and saved precisely for this device in the ETS project. If the FDSK is lost, the device cannot be commissioned in secure mode.

When performing a factory reset, the FDSK must be entered in the project again for secure commissioning.

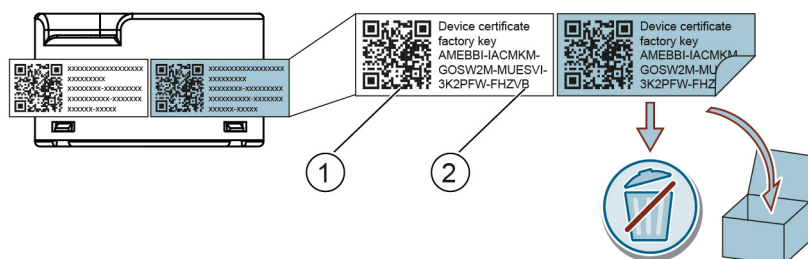


Fig. 6: Device certificate

Pos.	Description
1	QR code
2	Factory key

The device certificate is affixed to the side of the device. An extra copy of the device certificate is provided so that it can be removed for secure commissioning with the ETS and then kept in a safe place.



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The device certificate is to be removed from the device and stored in a safe place! The FDSK must not fall into the hands of unauthorized parties!

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## Disposal

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The device is considered an electronic device for disposal in accordance with European Directive and may not be disposed of as domestic waste.

- Use only designated channels for disposing the devices.
- Comply with all local and currently applicable laws and regulations.

## Power supply

Power supply	
Rated voltage KNX	DC 24 V (DC 21... 30 V)
Power consumption KNX	5 ... 18 mA
Power loss (internal consumption)	150 ... 170 mW

## Inputs

Binary inputs	
Number of inputs	3
Control lead (pre-assembled)	YY6x0.6
Input type	potential free
Pulse voltage if contact is open	5 V
Pulse current if contact is closed	Continuously 1.25 mA
Total length of extension input lead with pairs of twisted cables	max. 10 m
Lead type (preferred)	J-Y(St)Y
Input signal delay until first bus telegram after closing the contact	approx. 15 ms + debounce time (configurable)
Input signal delay until first bus telegram after opening the contact	approx. 15 ms + debounce time (configurable)
Debounce time (configurable), min. (= from)	10 ms
Debounce time (configurable), max. (= to)	255 ms

## Outputs

Switching outputs	
Number of dimming outputs	1
Switching voltage (at 50/60 Hz)	AC 230 V
Operating voltage, minimum rated value	230 V - 15 %
Operating voltage, maximum rated value	240 V + 6 %

Contact current	
Rated current per channel	1 A
Restrictions for rated current (device) – derating information	Power reduction when installed in wood or drywall -15 % for installation in multiple combinations -20%

Switching outputs	
Maximum power loss of the device at rated output	1.5 W
Maximum power loss per output at rated output with maximum resistive load	1.5 W

Switching capacity/load types	
Rated output with load type from incandescent lamps	Leading edge: 20 ... 210 W, trailing edge: 20 ... 230 W
Rated output with load type from HV halogen lamps	Leading edge: 20 ... 210 W, trailing edge: 20 ... 230 W
Rated output with load type from HV LED lamps	Leading edge: 1 ... 32 W, trailing edge: 1 ... 200 W
Rated output with load type from LV halogen lamps with electronic transformers	Leading edge: 1 ... 210 W, trailing edge: 1 ... 230 W
Rated output with load type from LV halogen lamps with magnetic transformers	Leading edge: 20 ... 210 W

## Reliability

Failure rate	
Failure rate (at 40°C)	293 fit

## Connection types

Clampable conductor cross-sections	
solid	0.5 ... 4 mm <sup>2</sup>
fine stranded without ferrule	0.5 ... 4 mm <sup>2</sup>
fine stranded with ferrule	0.5 ... 2.5 mm <sup>2</sup>
Tightening torque screw terminals	max. 0.8 Nm

## Mechanical data

Mechanical data	
Material housing	PC
Housing width	48 mm
Housing length	50 mm
Housing height	28 mm
Product weight	52 g
Fire load	0.55 kWh (2 MJ)

## Environmental conditions

Ambient conditions	
Environmental category (as per EN 60721-3-3)	3k5
Ambient temperature	-5 ... +45 °C
Storage/transport temperature	-25 ... +70 °C
Relative humidity (non-condensing)	5 % ... 93 %

## Protection settings

Protection settings	
Degree of pollution (according to IEC 60664-1)	2
Overtoltage category (according to IEC 60664-1)	3
Protection type IP	20
Electrical safety, bus	Yes
Electrical safety, device complies with	EN 50428
EMC requirements, device complies with	EN 50428

## Test mark

Test mark	
CE marking	Yes
KNX approval mark	Yes
EAC marking	Yes
RCM marking	Yes
UKCA marking	Yes

## Connection example

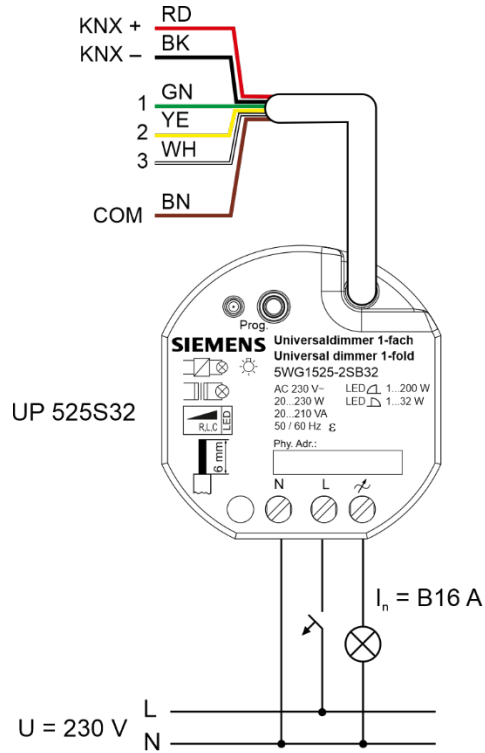


Fig. 7: Connection example

## Dimensions

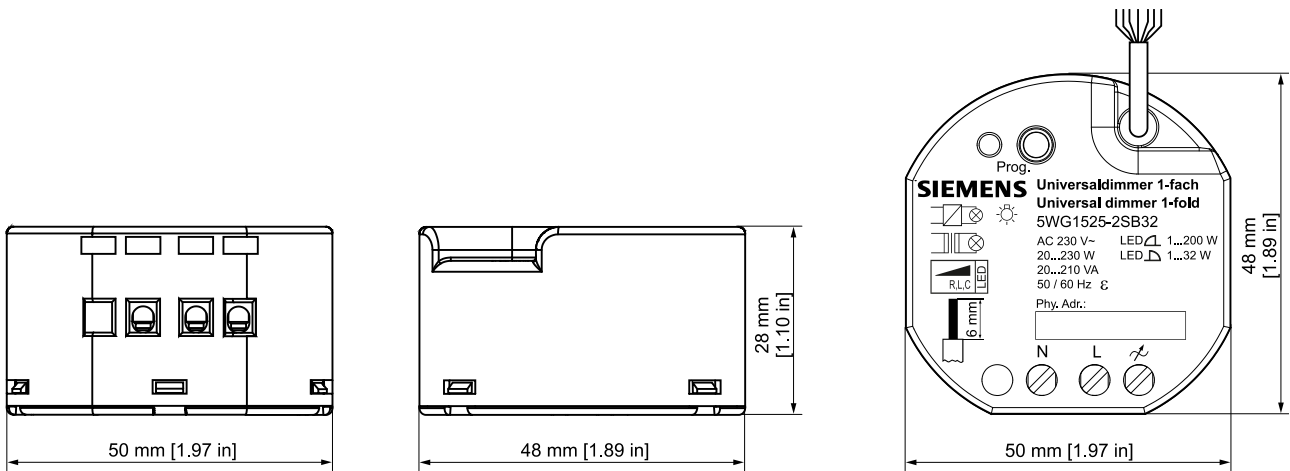


Fig. 8: Dimensions



Issued by  
Siemens Switzerland Ltd  
Smart Infrastructure  
Global Headquarters  
Theilerstrasse 1a  
CH-6300 Zug  
+41 58 724 2424  
[www.siemens.com/buildingtechnologies](http://www.siemens.com/buildingtechnologies)

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