21 A1 Universal dimmer 906703

Use of the application program

Product family: Lighting
Product type: Dimmer
Manufacturer: Siemens

Name: Universal dimmer N 527/02
Order no.: 5WG1 527-1AB02

Name: Universal dimmer N 528/02
Order no.: 5WG1 528-1AB02

Functional description

The universal dimmers N 527/02 and N 528/02 offer the following functions with the application program "21 A1 Universal dimmer 906703":

Switching On/Off:
In the event of an ON telegram, the parameterisation determines whether a set brightness value is selected or whether the value prior to switching off is set. If the starting value lies below the set minimum value, the minimum value is set; if the value lies above the maximum value, the maximum value is set. It can be set via parameters whether the dimmer dims or jumps to the new value. OFF telegrams always switch off. Depending on the parameterisation, the switching telegrams activate ON/OFF delays or overshoot times.

Dimming:
The characteristic "Dimming time" can be set. On receipt of the step width, the actuator starts to change the brightness in the given direction with an adjustable speed. If a "Stop" command is received before the end of the dimming process, the process is interrupted and the achieved brightness value is retained. Dimming telegrams always immediately affect the dimmer output. Any active delay times are interrupted. During time switch mode, the overshoot time is restarted if it has not been switched off. It can be set via parameters whether it is possible to switch on or off via dimming.

Send dimming value (8 bit):
Object 2 and object 5 set the dimmer to a defined value. It can be set whether the dimmer jumps or dims to this value. If an object receives the value 0, the dimmer switches off. If the dimmer should be switched off, it can be specified via a parameter whether the dimmer immediately adopts the received value and switches on (ON delays are taken into account) or only adopts the received value after an ON command. The set starting value is then invalid.
If an ON delay is selected, the dimmer only sets the received brightness value once the period has elapsed.

Status value:
Object 6 is an 8-bit status object. It contains the current analogue value for the status of the dimmer. It can be sent automatically and/or read. The software also has a mechanism available for the automatic sending of the status, whereby this mechanism dynamically limits the sending frequency. The method of operation of the sending mechanism is as follows:

- It is only sent if the new value is not the same as the value that was last sent.
- On receipt of a switching signal whereby the dimmer jumps to the value, it is **always** sent immediately.
- On receipt of a switching signal whereby the dimmer dims to the value, the first signal is **always** sent after a delay of approx. 2 seconds.
- On receipt of a dimming signal, the first signal is sent after a delay of approx. 2 seconds (at least), since the brightness level is often still changing within the 2 seconds.
- On receipt of a value signal whereby the dimmer jumps to the value, it is sent immediately. (Exception: a dimmed brightness change occurred immediately before which triggered the dynamic sending mechanism).
- On receipt of a value change whereby the dimmer dims to the value, the first signal is sent after a delay of approx. 2 seconds (at least).

Once each signal is sent, the period is calculated when the next signal may be sent (Exception: receipt of the switching signal). The intervals between the periods become longer by 1 second (i.e. dynamically), if brightness changes are produced continuously. The maximum interval can be parameterised (2 to 15 seconds). If no signal should be sent when the next calculated period is reached because there is currently no change in the brightness level, the intervals between the periods start from the beginning again (from 2 seconds).

On/Off status:
It can be defined via parameters whether a sending of the switching status should take place. If the switching status should be sent, it can further be parameterised whether it is sent via the switching object or via a further object (additional status object).

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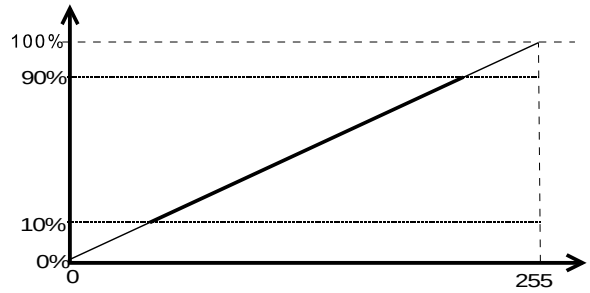
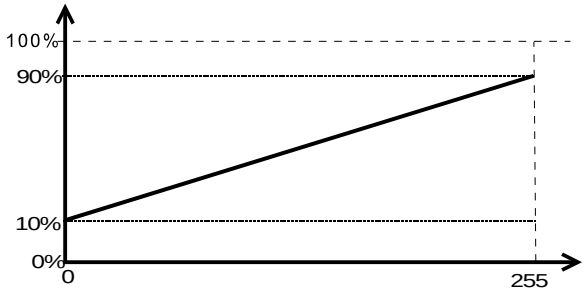
Dimming value limit



The application program has 2 options for limiting the brightness level. Via the first limit, it is possible to parameterise a maximum and minimum brightness value. When dimming brighter, the required brightness value can only adopt the set maximum value as a maximum. When dimming darker, the brightness value can only adopt the minimum value as a minimum. On receipt of a value signal, a distinction can be made as to whether the value that lies outside the value range of the minimum value and the maximum value is ignored or is adapted to the minimum value/maximum value.

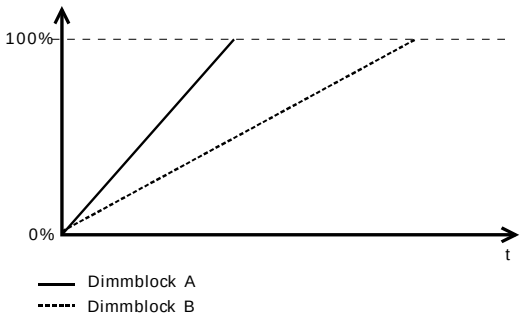
Brightness limit:
A dimming range can be parameterised with the second limit. If e.g. the parameters of the first limit are set to "Maximum dimming value in dimming range = 100%" and "Minimum dimming value in dimming range = 0.5% (background brightness)", it is possible to set the maximum brightness to 80% via the second limit (e.g. min. = 10%, max. = 80%). This means that the receipt of a value signal: 255 (100%) then corresponds to 80% brightness; the receipt of a value signal: 230 (90%) corresponds to 73% brightness etc. This second limit is mainly used for hardware adaptation, whereby the maximum possible control range is limited as well as a minimum background brightness, without limiting the object values.



Bus voltage failure:
On bus voltage failure, the program always stores the current actual value so that it is available on bus voltage recovery. When the bus voltage fails, the dimmer can be switched to a specific brightness value, switched off or not switched.

Bus voltage recovery:
The brightness value that is set on bus voltage recovery can be set via the parameters.

Dimming blocks:
Two different dimming time curves can be used with the universal dimmer. Both dimming units have the following objects
On/Off
Dimming
Value



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Communication objects

Nummer	Name	Funktion	Länge
0	Dimming On / Off, Dimming unit A	On / Off, Status	1 bit
1	Dimming, Dimming unit A	Brighter / Darker	4 bit
2	Value, Dimming unit A	8-bit Value	1 Byte
3	Dimming On / Off, Dimming unit B	On / Off	1 bit
4	Dimming, Dimming unit B	Brighter / Darker	4 bit
5	Value, Dimming unit B	8-bit Value	1 Byte
6	Status	8-bit Value	1 Byte
7	Status	On / Off	1 bit
8	Failure Overload / Short Circuit	On / Off	1 bit
9	Failure Excess temperature	On / Off	1 bit
10	Diagnosis	Diagnosisbits	1 Byte

Note:

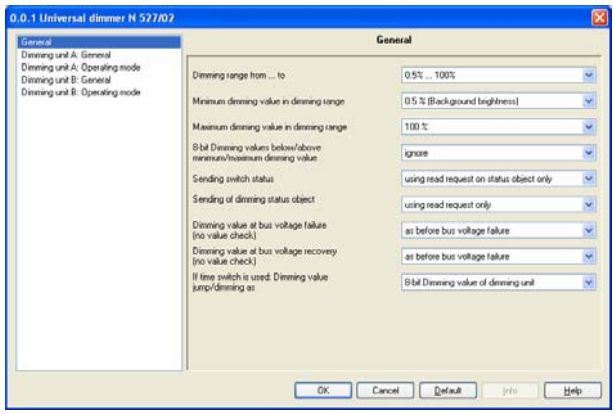
The view of the objects can be arranged individually i.e. this view may vary.

Obj	Object name	Function	Type	Flags
0	Dimming On / Off, Dimming unit A	On / Off, Status	1 Bit	CRWU
The switch output of the universal dimmer is addressed via this object. The current switching state can also be queried via this object.				
1	Dimming, Dimming unit A	Brighter / Darker	4 Bit	CW
The dimming telegram is received via this object.				
2	Value, Dimming unit A	8-bit Value	1 Byte	CW
A brightness value is received via this object.				
3	Dimming On / Off, Dimming unit B	On / Off	1 Bit	CW
The switch output of the universal dimmer is addressed via this object.				
4	Dimming, Dimming unit B	Brighter / Darker	4 Bit	CW
The dimming telegram is received via this object.				
5	Value, Dimming unit B	8-bit Value	1 Byte	CW
A brightness value is received via this object.				
6	Status	8-bit Value	1 Byte	CR
A brightness value is sent automatically as a status via this object after a change in the object value or queried on read request.				
7	Status	On / Off	1 Bit	CR
An On/Off signal is sent automatically as a status after a change in the object value or queried on read request.				
8	Failure Overload / Short circuit	On / Off	1 Bit	CRT
An overload or short circuit is sent automatically as an error status via this object.				
9	Failure Excess temperature	On / Off	1 Bit	CRT
An overtemperature of the dimmer is sent automatically as an error status via this object.				
10	Diagnosis	Diagnosisbits	1 Byte	CR
This communication object can be read out via the *instabus EIB*. Meaning of the individual bits Bit 0 (=1) Overload / short circuit Bit 1 (=1) Excess temperature – Level 1 (dims to minimum brightness) Bit 2 (=1) Excess temperature – Level 2 (dimmer switches off) Bit 3 (=1) Load cannot be dimmed Bit 4 (=1) Phase alignment mode (=0) Phase control mode Bit 5-7 Unassigned				

Maximum number of group addresses: 23
Maximum number of associations: 24

Parameters

General:



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Parameters	Settings
Dimming range from ... to	**0.5% ... 100%** 0.5% ... 90% 0.5% ... 80% 0.5% ... 70% 0.5% ... 60% 0.5% ... 50% 10% ... 100% 10% ... 90% 10% ... 80% 10% ... 70% 10% ... 60% 10% ... 50% 20% ... 100% 20% ... 90% 20% ... 70% 20% ... 60% 30% ... 100% 30% ... 90% 30% ... 70% 40% ... 100% 40% ... 90% 40% ... 80% 50% ... 100% 50% ... 90%
This parameter defines the control range of the universal dimmer for the connected hardware. See also the description of the Brightness limit.	
Minimum dimming value in dimming range	**0.5% (Background brightness),** 5%, 10%, 15%, 20%, 25%, 30%, 35%, 40%, 45%, 50%, 60%, 70%
The minimum dimming value of the first limit can be defined via this parameter. When dimming darker, the brightness value can only adopt this dimming value as a minimum.	
Maximum dimming value in dimming range	**100%,** 95%, 90%, 85%, 80%, 75%, 70%, 65%, 60%, 55%, 50%, 40%, 30%
The maximum dimming value of the first limit can be defined via this parameter. When dimming brighter, the brightness value can only adopt this dimming value as a maximum.	
8-bit dimming values below/above minimum / maximum dimming value	**ignore** adjust to min./max. dimming value
On receipt of a value range, it is possible to distinguish as to whether the value that lies outside the value range of the minimum and maximum value is ignored (ignore) or adapted to the minimum/maximum value (adjust to min./max. dimming value).	

Parameters	Settings
Sending switch status	via separate status object via switching object **using read request on status object only** using read request on switching object only
The sending object for the switching status can be defined with this parameter.	
Sending of dimming status object	on change of dimming value **using read request only**
This object serves as a sending object for the current status (brightness value) of the universal dimmer. This can be read out via the bus (e.g. for visualisation) or sent automatically after a change.	
Dimming value at bus voltage failure (no value check)	**as before bus voltage failure** 100%, 95%, 90%, 85%, 80%, 75%, 70%, 65%, 60%, 55%, 50%, 45%, 40%, 35%, 30%, 25%, 20%, 15%, 10%, 5%, 0.5% (Background brightness), switching off
This parameter defines the dimming value on bus voltage failure. Note: This value is also set on bus voltage failure if it does not lie in the range of the minimum and maximum dimming value (no value check).	

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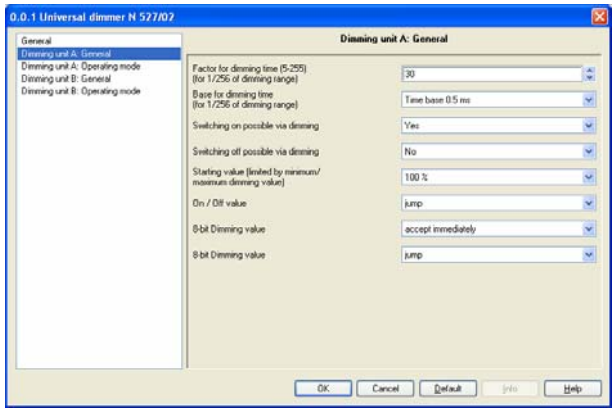
Parameters	Settings
Dimming value at bus voltage recovery (no value check)	**as before bus voltage failure** maximum dimming value minimum dimming value 100%, 95%, 90%, 85%, 80%, 75%, 70%, 65%, 60%, 55%, 50%, 45%, 40%, 35%, 30%, 25%, 20%, 15%, 10%, 5%, 0.5% (Background brightness), switching off
This parameter defines the dimming value on bus voltage recovery. Its time response is determined by the configuration of dimming unit A. This means that a dimming value > 0 is switched on continuously if the operating mode for dimming unit A has been set to normal operation. If dimming unit A is however parameterised as a time switch, the dimming value set on bus voltage recovery is switched off again via time control, according to the enabled overshoot times of dimming unit A. Note: This value is also set on bus voltage recovery if it does not lie in the range of the minimum and maximum dimming value (no value check).	
If time switch is used: Dimming value jump/ dimming as	**8-bit Dimming value of dimming unit** On / Off value of dimming unit
This parameter defines the dimming behaviour in time switch mode once the period has elapsed.	

Dimming unit A: General



Parameters	Settings
Factor for dimming time (5-255) (for 1/256 of dimming range)	**30**
Base for dimming time (for 1/256 of dimming range)	**Time base 0.5 ms** Time base 8.0 ms Time base 130 ms Time base 2.1 sec Time base 33 sec
The dimming time is set using the two parameters of base and factor (Dimming time = Factor x Base). It specifies in which period the dimming is carried out by 1/256.	
Switching on possible via dimming	**Yes** No
If it should be possible to switch on via dimming in the OFF state, this must be enabled in this parameter (“Yes”).	
Switching off possible via dimming	Yes **No**
If the brightness is dimmed down to the minimum value in the ON state, it is possible to define via this parameter whether the universal dimmer switches off the lighting.	
Starting value (limited by minimum / maximum dimming value)	**100%**, 95%, 90%, 85%, 80%, 75%, 70%, 65%, 60%, 55%, 50%, 40%, 30%, 20%, 10%, 0.5% (Background brightness), last value
This parameter indicates the starting value on receipt of an (ON) switching signal. The set value is limited by the program to the range between the minimum/maximum dimming value. ”last value”: When switching on, the brightness value that was last active prior to switching off is set.	
On / Off value	**jump** dimming
This parameter defines whether the universal dimmer immediately adopts the brightness value (jump) on receipt of an ON or OFF telegram via the bus or regulates the new value via a ramp defined by the dimming time (dimming).	

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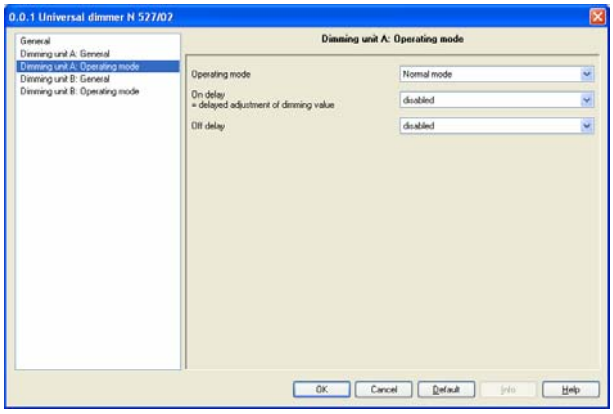
Parameters	Settings
8-bit Dimming value	**accept immediately** only accept on On
This parameter defines whether the universal dimmer when it is switched off carries out a dimming value command received via the bus (accept immediately) or stores the dimming value and sets this value after the next ON telegram.	
8-bit Dimming value	**jump** dimming
This parameter defines whether the universal dimmer immediately adopts a dimming value telegram received via the bus (jump) or regulates the new value via a ramp defined by the dimming time (dimming).	

Dimming unit A: Operating mode

Normal mode



Parameters	Settings
Operating mode	**Normal mode** Time switch
This parameter enables toggling between normal mode and time switch mode.	
On delay = delayed adjustment of dimming value	enabled **disabled**
This parameter determines whether an ON delay should be set. In the subsequent parameter, it is possible to specify which commands the ON delay should affect.	
On delay enabled	**for On command and x% dimming value** only for On command only for x% dimming value
This parameter enables you to select which telegrams are subject to the ON delay (delayed adjustment of dimming value) and which telegrams should be routed immediately.	

Parameters	Settings
Factor for On delay (5- 127)	**127**
Base for On delay	**Time base 130 ms** Time base 260 ms Time base 520 ms Time base 1.0 sec Time base 2.1 sec Time base 4.2 sec Time base 8.4 sec Time base 17 sec Time base 34 sec Time base 1.1 min Time base 2.2 min Time base 4.5 min Time base 9.0 min Time base 18 min Time base 35 min Time base 1.2 hr
The time for the ON delay is set here. The time is calculated from the selected base multiplied by the factor entered here. Note: An attempt should always be made to set the required time with the smallest possible base as the selected base simultaneously specifies the maximum timing error.	
Off delay	**disabled** one step two steps
This parameter determines whether an OFF delay should be set. The OFF delay can be selected as one step i.e. the dimmer is switched off once the period has elapsed or two steps i.e. an intermediate value is set once step 1 has elapsed and the dimmer is switched off once step 2 has elapsed. The OFF delay causes switching off with a delay.	
Off delay enabled	**for Off command and 0% dimming value** only for Off command only for 0% dimming value
This parameter enables you to select which telegrams are subject to the OFF delay and which cause the dimmer to switch off immediately.	

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Parameters	Settings
Factor for Off delay first step (5- 127)	**127**
Base for Off delay first step	**Time base 130 ms** Time base 260 ms Time base 520 ms Time base 1.0 sec Time base 2.1 sec Time base 4.2 sec Time base 8.4 sec Time base 17 sec Time base 34 sec Time base 1.1 min Time base 2.2 min Time base 4.5 min Time base 9.0 min Time base 18 min Time base 35 min Time base 1.2 hr
The time for the OFF delay is set here. The time is calculated from the selected base multiplied by the factor entered here. Note: An attempt should always be made to set the required time with the smallest possible base as the selected base simultaneously specifies the maximum timing error.	
Factor for Off delay second step (5- 127)	**127**
Base for Off delay second step	**Time base 130 ms** Time base 260 ms Time base 520 ms Time base 1.0 sec Time base 2.1 sec Time base 4.2 sec Time base 8.4 sec Time base 17 sec Time base 34 sec Time base 1.1 min Time base 2.2 min Time base 4.5 min Time base 9.0 min Time base 18 min Time base 35 min Time base 1.2 hr
Once the period set here has elapsed, the dimmer is switched off. The time is calculated from the selected base multiplied by the factor entered here. Note: An attempt should always be made to set the required time with the smallest possible base as the selected base simultaneously specifies the maximum timing error.	

Parameters	Settings
Brightness value after first step of Off delay	0.5%, 5%, 10%, 15%, 20%, 25%, 30%, 35%, 40%, 45%, **50%**, 55% 60%, 65%, 70%, 75%, 80%, 85%, 90%, 95% (limited by min./max. dimming value)
This parameter determines the intermediate value which is set once step 1 has elapsed. The parameterised value is limited by the program to the range between the minimum/maximum dimming value. The intermediate value is only set if it is darker than the current brightness value.	

Time switch mode

Parameters	Settings
Operating mode	Normal mode **Time switch**
This parameter enables toggling between normal mode and time switch mode.	
Overshoot time	**one step** two steps
This parameter determines whether the overshoot time should be implemented as one step i.e. the dimmer is switched off once the period has elapsed or two steps i.e. an intermediate value is set once step 1 has elapsed and the dimmer is switched off once step 2 has elapsed.	
Factor for overshoot time first step (5- 127)	**127**
Base for overshoot time first step	**Time base 130 ms** Time base 260 ms Time base 520 ms Time base 1.0 sec Time base 2.1 sec Time base 4.2 sec Time base 8.4 sec Time base 17 sec Time base 34 sec Time base 1.1 min Time base 2.2 min Time base 4.5 min Time base 9,0 min Time base 18 min Time base 35 min Time base 1.2 hr
Once the period set here has elapsed, the dimmer is switched off. The time is calculated from the selected base multiplied by the factor entered here. Note: An attempt should always be made to set the required time with the smallest possible base as the selected base simultaneously specifies the maximum timing error.	

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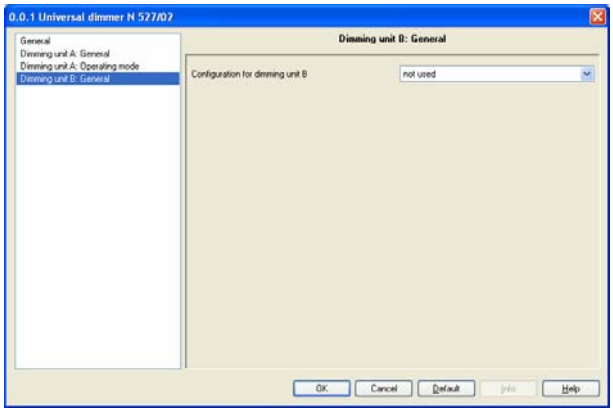
Parameters	Settings
Factor for overshoot time second step (5- 127)	**127**
Base for overshoot time second step	**Time base 130 ms** Time base 260 ms Time base 520 ms Time base 1.0 sec Time base 2.1 sec Time base 4.2 sec Time base 8.4 sec Time base 17 sec Time base 34 sec Time base 1.1 min Time base 2.2 min Time base 4.5 min Time base 9.0 min Time base 18 min Time base 35 min Time base 1.2 hr
Once the period set here has elapsed, the dimmer is switched off. The time is calculated from the selected base multiplied by the factor entered here. Note: An attempt should always be made to set the required time with the smallest possible base as the selected base simultaneously specifies the maximum timing error.	

Dimming unit B: General



Parameters	Settings
Configuration for dimming unit B	**not used** same configuration, other dimming time separate configuration
With this parameter, a second dimming speed and configuration can be set. With the option “same configuration, other dimming time” as set for dimming unit A, the output can be operated with a second dimming speed. In addition, it is possible to enter your own configuration. This configuration can be parameterised like dimming unit A.	

Space for notes