MIX Series Dimmer Actuator SMG 2 S, upgrade module SME 2 S

SMG 2 S	491 0 273
SME 2 S	491 0 274

Contents

1 Functional characteristics

The series is a series of devices comprising basic modules
(e.g. SMG 2 S, RMG 4 S or RMG 4 C-Load, BME 6, HMG 4, JMG 4, DMG 2) and upgrade modules (e.g. SME 2 S, RME 4 S or RME 4 C-Load, BME 6, HME 4, JME 4, DME 2).
You can connect a maximum of any 2 upgrade modules in this series to any basic module in the series.

Table 1

Designation	Description
SMG 2 S	2 channel 1-10V dimmer, basic module
SME 2 S	2 channel 1-10V dimmer, upgrade module

1.1 General

The SMG 2 S universal dimmer is a series device for activating electronic upstream devices with a 1-10V interface.

1.2 Operation

Each channel of the dimmer actuators has an LED which indicates its status and a manual switch with the settings ON/OFF/BUS. The function of the manual switch and the LED does not require mains supply to terminals 1 and 2 nor bus voltage.

Turning the manual switch to "0" dims the 1-10V output to 0% irrespective of all other parameters and switches off the switch output; the status LED for the channel is switched off.[1]

Turning the manual switch to "1" turns the 1-10V output to 100% irrespective of all other parameters and switches on the switch output; the status LED for the channel lights up.[1]

Turning the manual switch to the "Bus" setting allows you to control the dimmer via the bus.
The status LED for the channel comes on at a dimmer value of 1% and is switched off at 0%.

In the event of excessive temperature, i.e. overloading of the 0-10 V connection, the load is dimmed up to 100%.
This error is reported by the status LED flashing rapidly.

[1] If the switch contact is open (dimming value = 0% or manual switch is at OFF) the status LED flashing slowly indicates that there is either no voltage via the terminals 3-4 or 7-8 or an insufficient load has been connected (< minimum load 5W).

1.3 Features of the 1-10 V dimmer actuators

- Manual switch for each channel
- Status LED for each channel
- Upgradeable modular concept for a variety of applications
- Upgradeable to 6 channels per bus user
- Different modules can be combined to meet the exact requirements of the user and to offer the best possible value for money
- Possible integration of the channels into a maximum of 8 scenes
- Adjustable response to bus failure and restoration of the bus/mains power

1.4 Important information

The EIB voltage must be switched off when plugging together or separating modules.

2 Technical data

2.1 SMG 2 S, SME 2 S technical data

Supply voltage	Mains voltage 230 V/ 50 Hz +/- 10 % plus bus voltage with SMG 2 S
Permitted operating temperature	-10 ℃ ...+ 50°C
Power draw from the mains supply:	Max. 2.5 VA
Current draw from bus voltage: (with SMG 2 S)	Max. 10 mA
Bus connection (with SMG 2 S)	Bus terminal
Protection class	II
Protection rating	EN 60529 IP 20
Dimensions of device	HxWxD 90 x 72 x 68 (mm)
Dimensions of front panel:	HxW 45 x 72 (mm)
1-10V connections	
Quantity	2
Maximum load	100 mA
Relay	
Quantity	2
Type of contact	Floating NO contact
Contact opening	<3 mm
Mechanical switching operations	> 1 x 10^6
Nominal voltage	230 V AC +-10%, 45 to 60 Hz
Nominal current	16 A (250 V AC) 12 A (three-phase current 380 V AC)
Switching of different phases	Possible
Switching capacity	
Minimum load	5 W
Capacitive load	max.140 µF
Incandescent lamps:	2760 W
Response to failure of the voltage supply	
Mains and bus voltage	Adjustable
Bus voltage only	Adjustable
Behaviour after restoration of the bus/mains power	Adjustable

Fluorescent lamp load:

T26 lamps with EVG

18 W (e.g. Osram EVG HF 1 x 18 /230 – 240 DIM)	36 EWG
36 W	30 EWG
58 W	26 EWG
2 x 18 W	20 EWG
2 x 36 W	20 EWG
2 x 58 W	13 EWG

Compact fluorescent lamps with external EVG

Quantity of EVG (single lamp) for TC- D and TC-T lamps (D/E, T/E lamps)	
18 W (e.g. Osram QT –T/E 1 x 18 /230 -240 DIM)	25 EVG
26 – 42 W (e.g. Osram QT – T/E 1 x 26 -42 /230 -240 DIM)	14 EVG

Quantity of EVG (double lamp) for TC- D and TC-T lamps (D/E, T/E lamps)	
2 x 18 W (e.g. Osram QT- T/E 2 x 18 /230 – 240 DIM)	25 EVG
2 x 26 – 42 W (e.g. Osram QT – T/E 2 x 26 – 42 /230 -240 DIM)	14 EVG

EVG (single lamp) for T5 and T8 fluorescent lamps	
14 – 24 W (e.g. Osram QTI 1 x 14/24 DIM)	20 EVG
18 W (e.g. Osram QTI 1 x 18 DIM)	20 EVG
21 – 39 W (e.g. Osram QTI 1 x 21/39 DIM)	20 EVG
28 – 54 W (e.g. Osram QTI 1 x 28/54 DIM)	20 EVG
35 W, 49 W, 80 W (e.g.Osram QTI 1 x 35/49/80DIM)	17 EVG
36 W (e.g. Osram QTI 1 x 36 DIM)	20 EVG
58 W (e.g. Osram QTI 1 x 58 DIM)	20 EVG

EVG (double lamp) for T5 and T8 fluorescent lamps	
2 x 14 - 24 W (e.g. Osram QTI 2 x 14/24 DIM)	15 EVG
2 x 18 W (QTI 2 x 18 DIM)	15 EVG
2 x 21 - 39 W (e.g. Osram QTI 2x21/39 DIM)	12 EVG
2 x 28 - 54 W (e.g. Osram QTI 2 x 28/54 DIM)	12 EVG
2 x 35 - 49 W (e.g. Osram QTI 2 x 35/49 DIM)	12 EVG
2 x 36 W (e.g. Osram QTI 2 x 36 DIM)	12 EVG
2 x 58 W (e.g. Osram QTI 2 x 58 DIM)	12 EVG
2 x 35/49/80 W (e.g. Osram QTI 2 x 35/49/80 DIM)	8 EVG

EVG (three and four lamp) for T5 and T8 fluorescent lamps	
3 x 14 - 24 W (e.g. Osram QTI 3 x 14/24 DIM)	14 EVG
4 x 14 - 24 W (e.g. Osram QTI 4 x 14/24 DIM)	12 EVG
3 x 18 W (e.g. Osram QTI 3 x 18 DIM)	20 EVG
4 x 18 W (e.g. Osram QTI 4 x 18 DIM)	14 EVG

3 The application program "MiX series V1.4 switching and dimming"

3.1 Selection in the product database

Manufacturer	THEBEN AG
Product family	Dimmer
Product type	SMG 2 S
Program name	Switch, dimmer, heating drive

The ETS database can be found on our website: http://www.theben.de

Table 2

Number of communication objects:	68
Number of group addresses:	104
Number of associations:	105

3.2 Parameter pages

Each channel has 2 parameter pages, and all channels have an identical layout.

Table 3

Function	Description
General	Selection of the connected upgrade modules and the general parameter for the cyclic sending of feedback
DMG 2 / SMG2 C1S1	1. channel of the basic module: general dimming parameters
DMG 2 / SMG2 C1S2	1. channel of the basic module: soft switching, forced mode etc.
DMG 2 / SMG2 C2S1	2. channel of the basic module: general dimming parameters
DMG 2 / SMG2 C2S2	2. channel of the basic module: soft switching, forced mode etc.
E1 DME2 / SME2 C1S1	1. channel of upgrade module 1: general dimming parameters
E1 DME 2 / SME2 C1S2	1. channel of upgrade module 1: soft switching, forced mode etc.
E1 DME 2 / SME2 C2S1	2. channel of upgrade module 1: general dimming parameters
E1 DME 2 / SME2 C2S2	2. channel of upgrade module 1: soft switching, forced mode etc.
E2 DME2 / SME2 C1S1	1. channel of upgrade module 2: general dimming parameters
E2 DME 2 / SME2 C1S2	1. channel of upgrade module 2: soft switching, forced mode etc.
E2 DME 2 / SME2 C2S1	2. channel of upgrade module 2: general dimming parameters
E2 DME 2 / SME2 C2S2	2. channel of upgrade module 2: soft switching, forced mode etc.

3.3 Communication objects

With the MiX Series, a maximum of 20 objects are available for each module.
The object numbers 0...19 are exclusively for the basic module,
nos. 20...39 for the first upgrade module and
nos. 40...59 reserved for the second upgrade module.
In addition there are the 3 central objects and the scene object, i.e. object nos. 60...63.

The following table contains descriptions of objects 0 ... 19 (basic module) and the central objects
.
The object structure and its sequence are identical for the upgrade modules (EM 1 / EM 2) and the basic module (GM).
The central objects are valid for the entire system, i.e. basic module + upgrades.

3.3.1 Object characteristics

Table 4

	Object	Function	Object name	Type	Response
Basic module	0	Switching ON/OFF	GM DMG2 / SMG 2 S channel 1	1 bit	Receive
	1	Brighter / darker	GM DMG2 / SMG 2 S channel 1	4 bits	Receive
	2	Dimming value	GM DMG2 / SMG2 channel 1	1 byte	Receive
	3	Soft switch	GM DMG2 / SMG2 channel 1	1 bit	Receive
	4	Forced mode ON/OFF Dimming value for forced mode	GM DMG2 / SMG2 channel 1	1 bit 1 byte	Receive
	5	Feedback in %	GM DMG2 / SMG2 channel 1	1 byte	Send
	6	Feedback On/Off	GM DMG2 / SMG2 channel 1	1 bit	Send
	7	General error message	GM DMG2 / SMG2 channel 1	1 bit	Send
	8	Load failure message Excess temperature message Short circuit message Load type message (R, C/L) Bus/manual mode message	GM DMG2 / SMG2 channel 1	1 bit	Send
	9	Status message (bit set)	GM DMG2 / SMG2 channel 1	1 byte	Send
	10	Switching ON/OFF	GM DMG2 / SMG2 channel 2	1 bit	Receive
	11	Brighter / darker	GM DMG2 / SMG2 channel 2	4 bit	Receive
	12	Dimming value	GM DMG2 / SMG2 channel 2	1 byte	Receive
	13	Soft switch	GM DMG2 / SMG2 channel 2	1 bit	Receive
	14	Forced mode ON/OFF Dimming value for forced mode	GM DMG2 / SMG2 channel 2	1 bit 1 byte	Receive
	15	Feedback in %	GM DMG2 / SMG2 channel 2	1 byte	Send
	16	Feedback On/Off	GM DMG2 / SMG2 channel 2	1 bit	Send
	17	General error message	GM DMG2 / SMG2 channel 2	1 bit	Send
	18	Bus/manual mode message	GM DMG2 / SMG2 channel 2	1 bit	Send
	19	Status message (bit set)	GM DMG2 / SMG2 channel 2	1 byte	Send
Central	60	Switching ON/OFF	Central continuous ON	1 bit	Receive
	61	Switching ON/OFF	Central continuous OFF	1 bit	Receive
	62	Switching ON/OFF	Central switching	1 bit	Receive
	63	Call/save scene	Scene	1 byte	Receive

3.3.2 Description of objects

- **Objects 0, 10, 20, 30, 40, 50 "Switching ON/OFF"**

A 1 on this object dims up to 100%,
and 0 dims to 0%

- **Objects 1, 11, 21, 31, 41, 51 "Brighter/darker"**

This object is actuated with 4-bit telegrams (EIS 2 relative dimming).
This function can be used to dim the light up or down in increments (with 1...64 increments)
.
In the standard application, telegrams are sent with 64 increments.
IMPORTANT: The response to 4-bit telegrams depends on the
“Switching on/off with a 4-bit telegram” parameter.
See appendix: 4-bit telegrams (brighter/darker)

- **Objects 2, 12, 22, 32, 42, 52 "Dimming value"**

This object can be used to select the desired dimmer setting directly.
Format: 1 byte percentage value EIS 2 dimming, value.
0 = 0%
255 = 100%

- **Objects 3, 13, 23, 33, 43, 53 "Soft switching"**

A “1” on this object starts a soft switching cycle, i.e.:
The brightness is gradually increased, starting from the minimum brightness.
The dimming value remains constant for the programmed time and is then gradually reduced after this time has elapsed.
Once the programmed minimum brightness has been reached the dimming value is reset to 0%.
The cycle can be extended or prematurely terminated via telegrams.

This sequence can also be controlled with a **timer** if the parameter "*Time between soft ON and soft OFF”* is set to *"Until soft OFF telegram"*.
The dimming cycle is then started with a “1” and finished with a “0”.

See appendix: Applications for the "Soft switching" function

- **Objects 4, 14, 24, 34, 44, 54 "Forced mode = 1" / "Forced mode = 0" / "Forced mode through dimming value"**

The function of the forced mode object can be configured as a 1-bit or 1-byte object.

Table 5

Configuration	Forced mode		Response with forced mode	
	Trigger with	End with	Start	End
As 1-bit object	1 or 0 (configurable)	0 or 1 (configurable)	Configurable in the application program	
As 1-byte object	1 ... 255	0	The triggering telegram also acts simultaneously as a forced mode dimming value.	The last dimming value before forced mode is restored.

- **Objects 5, 15, 25, 35, 45, 55 "Feedback in %"**

Sends the new dimming value after a change as soon as a dimming procedure is completed, i.e. once the new setpoint value has been reached.
Format: 1 byte, 0 ... 255 i.e. 0 ... 100%

IMPORTANT:
This object must not be placed in the same group address as object 2.

- **Objects 6, 16, 26, 36, 46, 56 "Feedback ON/OFF"**

Sends the current dimming status:
1 = current dimming value is between 1% and 100%
0 = current dimming value is 0%

- **Objects 7, 17, 27, 37, 47, 57 "General error message"**

Used as a malfunction signal:
0 = no error
1 = an error has been detected

This message can be displayed on a screen.
For detailed error analysis refer to Object 9.

- **Objects 8, 18, 28, 38, 48, 58 "Load failure message", "Excess temperature message", "Short circuit message", "Load type message (R, C/L)", "Bus/manual mode message"**

The function of this object depends on the “Diagnosis and feedback” parameter.
This allows a more specific error message.

Table 6

“Diagnosis and feedback” parameter	Function of object 8	Application
Feedback objects, status, general error	-	-
Load failure, feedback objects, status, general error	Load failure message	No voltage supply to terminals 1-2
Excess temp., feedback objects, status, general error	Excess temperature message	Overload of 1-10 V connection. The channel is dimmed up to 100% and the status LED flashes rapidly.
Short circuit, feedback objects, status, general error	Short circuit message	SMG 2 S / SME 2 S: Internal error. The status LED flashes rapidly and slowly in turn.
R,C/L load, feedback objects, status, general error	Load type message (R, C/L)	No mains connection or no load connected to relay, no measurable voltage between terminals 3-4 or 7-8. The status LED flashes slowly (once a second).
Bus/manual, feedback objects, status, general error	Bus/manual mode message	Indicates whether the switch on the dimmer housing is set to bus operation or not. 1 = manual mode (manual 0 or manual 1 position) 0 = bus (bus position)

- **Objects 9, 19, 29, 39, 49, 59 "Bit set status message"**

Diagnosis object for status and error display.
Status information is encoded in one byte according to the following bit pattern.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
n.a.	n.a.	x	x	x	x	x	x

x = value 1 or 0

Table 7

	Bit	Name	Application
Error	0	Load failure	No voltage supply to terminals 1-2
	1	Excess temperature	Overload of 1-10 V connection
	2	Short circuit	Internal error
Status	3	Type of load	No mains connection or no load connected to relay, no measurable voltage between terminals 3-4 or 7-8. The channel LED flashes slowly
	4	Manual/bus operation	1= manual switch on the device set to manual mode “0” or “1” 0= manual switch set to bus operation
	5	Dimming value	1= dimming value >0% 0= dimming value = OFF

- **Object 60 "Central continuous On"**

This object is a central object. It can be configured to be effective on all channels.
If this object is set to "1" all of the channels "participating" in this object are dimmed up to 100%.
If this object is set to "0" it has no effect on the channels.

- **Object 61 "Central continuous Off"**

This object is a central object. It can be configured to be effective on all channels.
If this object is set to "1" all of the channels "participating" in this object are dimmed to 0%.
If this object is set to "0" it has no effect on the channels.

- **Object 62 "Central switching"**

This object is a central object. It can be configured to be effective on all channels.
If a "1" or "0" is sent to this object then this is the same as if a "1" or "0" is sent to the switching objects of the channels (Object 0, Object 10, Object 20 ...). The same functionality could also be achieved by connecting all switching objects to the same group as that of this object.
Accordingly, using this object saves time during the assignment of the group addresses and also saves on the number of associations.

- **Object 63 "Scene"**

This object can be used to save and subsequently call "scenes".
The save process stores the current status of the dimming channel, regardless of how the status was brought about (e.g. via dimming values, switching commands, central objects or the manual switches).
The saved status is thus restored when called up.
Each channel can participate in a maximum of 8 scenes.

The following telegrams need to be sent in order to call or save scenes:

Table 8

Function	Value hexadecimal	Decimal value	Function
Save scene 1	$80	128	Each channel saves its current dimming value in the scene memory with the sent scene number, provided the channel is intended to participate in this scene. This scene memory remains alive even after bus failure or mains failure.
Save scene 2	$81	129	
Save scene 3	$82	130	
Save scene 4	$83	131	
Save scene 5	$84	132	
Save scene 6	$85	133	
Save scene 7	$86	134	
Save scene 8	$87	135	
Call scene 1	$00	0	Each channel adopts the dimming value stored in the scene memory under the sent scene memory, provided the channel is intended to take part in this scene.
Call scene 2	$01	1	
Call scene 3	$02	2	
Call scene 4	$03	3	
Call scene 5	$04	4	
Call scene 6	$05	5	
Call scene 7	$06	6	
Call scene 8	$07	7	

3.4 Parameters

3.4.1 General

Table 9

Designation	Values	Application
Type of basic module	BM is a DMG 2 or a SMG 2 S	With this application only an SMG 2 S can be used as the basic module.
Number of upgrade modules	**No upgrade** 1 upgrade module 2 upgrade modules	SMG 2 S SMG 2 S + 1 upgrade to the MiX Series SMG 2 S + 2 upgrades to the MiX Series
Type of first upgrade module EM1	**EM 1 is a DME 2 or an SME 2 S** EM 1 is an RME 4 S or RME 4 C-Load EM 1 is a BME 6 EM 1 is a JME 4 S EM 1 is an HME 4	Selection of the first upgrade module
Type of second upgrade module EM2	**EM 2 is a DME 2 or an SME 2 S** EM 2 is an RME 4 S or RME 4 C-Load EM 1 is a BME 6 EM 1 is a JME 4 S EM 1 is an HME 4	Selection of the second upgrade module
Time for cyclic sending of the feedback objects (if used)	2 minutes, 3 minutes 5 minutes, 10 minutes **15 minutes**, 20 minutes 30 minutes, 45 minutes 60 minutes	At what time intervals are the cyclic feedback telegrams to be sent?

3.4.2 SMG 2 S channel 1 S1, SMG 2 S channel 2 S1, EM 1 SME 2 S channel 1 S1, EM 2 SME 2 S channel 1 S1 etc.

Table 10

Designation	Values	Application
Minimum brightness	5%, 10%, 15%, 20% , 25% 30%, **35%**, 40%, 45%, 50%	Minimum dimming value for all dimming processes (except 0%). Any values (switch-on brightness, response to bus failure etc.) which are below this threshold are increased to the minimum brightness.
Dimming time from 0% to 100%	1 sec., 2 sec., 3 sec. 4 sec., **5 sec.**, 6 sec. 7 sec., 8 sec., 9 sec. 10 sec., 11 sec., 12 sec. 13 sec., 14 sec., 15 sec. 20 sec., 30 sec., 40 sec. 50 sec., 60 sec.	This setting determines the dimming speed for 4-bit telegrams (brighter/darker)
Response when receiving a dimming value	**Soft on** Immediate on	The dimming time parameter also applies here to the object dimming value. The received dimming value is adopted immediately.
Switch-on brightness	**Brightness value before previous switch-off** Minimum brightness 100 %, 10 %, 20 % 30 %, 40 %, 50 % 60 %, 70 % , 80 %, 90 %	The last dimming value before switching off is saved and restored. The configured minimum brightness is adopted. The dimmer adopts the selected value after it is switched on. Here again the configured minimum brightness needs to be taken into account.
Switching on/off with a 4-bit telegram	 No **Yes**	Defines the response if the channel is switched off and a 4-bit telegram (brighter/darker) is received. See appendix: Response to 4-bit telegrams Channel remains switched on or off. Channel is switched on and dimmed or switched off.

Continuation

Designation	Values	Application
Participation in central objects	**- Yes: in all central objects** - No: in no central object - only in central continuous ON - only in central continuous OFF - only in central switching - only in central switching and continuous ON - only in central switching and continuous OFF - only in central continuous ON and continuous OFF	Defines which central objects the channel responds to.
Participation in scenes	**Yes: in the scenes 1 - 8** Yes: in the scenes 1 - 4 Yes: in the scenes 5 - 8 Yes: in the scenes 3 - 6 Yes: in the scenes 1 - 2 Yes: in the scenes 3 - 4 Yes: in the scenes 5 - 6 Yes: in the scenes 7 - 8 Yes: in the scenes 1,2,5,6 Yes: in the scenes 1,2,7,8 Yes: in the scenes 1 - 6 Yes: in the scenes 3 - 8	Which scenes should the relevant channel be used in?
Behaviour after bus failure	**No change** Minimum brightness 100 % Off 10 %, 20 %, 30 % 40 %, 50 %, 60 % 70 %, 80 %, 90 %	How should the dimmer respond if the bus voltage fails and controls via the bus are therefore no longer available? Here again the configured minimum brightness needs to be taken into account.
Behaviour after restoration of the bus/mains power	Same as before bus failure Minimum brightness 100 % Off 10 %, 20 %, 30 % 40 %, 50 %, 60 % 70 %, 80 %, **90 %**	How should the dimmer react when normal operation is restored (bus and mains supply available)? Here again the configured minimum brightness needs to be taken into account.
Load selection (R, C or L)	**Automatic load detection (standard)** R, C load (incandescent bulbs, electronic power units) L load (wound transformers)	This parameter is not relevant for SMG 2 S /SME 2 S. The selected setting is ignored.

3.4.3 SMG 2 S channel 1 S2, SMG 2 S channel 2 S2, EM 1 SME 2 S channel 1 S2, EM 2 SME 2 S channel 2 S2 etc.

Table 11

Designation	Values	Application
Time for Soft ON	0 sec., 1 min., 2 min. 3 min., 4 min., 5 min. 6 min., 7 min., 8 min. 9 min., 10 min., 12 min. 15 min., 20 min., 30 min. 40 min., 50 min., 60 min.	Duration of the dimming-up phase (t1) for Soft switching (see appendix). 0 sec. = switch on immediately. **IMPORTANT**: For further information refer to the appendix: Retriggering and premature switch-off
Dimming value after Soft ON	10 %, 20 %, 30 %, 40 % 50 %, 60 %, 70 % , 80 % 90 %, **100 %**	Final value at the end of the Soft on phase (val) Note: Here again the configured minimum brightness needs to be taken into account.
Time between Soft ON and Soft OFF	Until "Soft Off" telegram 1 sec., 2 sec. 3 sec., 4 sec., 5 sec. 6 sec., 7 sec., 8 sec. 9 sec., 10 sec., 15 sec. 20 sec., 30 sec., 40 sec. 50 sec., 1 min., 2 min. 3 min., 4 min., **5 min.** 6 min., 7 min., 8 min. 9 min., 10 min., 12 min. 15 min., 20 min., 30 min. 40 min., 50 min., 60 min.	No time restriction; Soft Off phase is initiated by a telegram Delay (t2) to the start of the Soft Off phase
Time for Soft OFF	0 sec., 1 min., 2 min. 3 min., 4 min., 5 min. 6 min., 7 min., 8 min. 9 min., 10 min., 12 min. 15 min., 20 min., 30 min. 40 min., 50 min., 60 min.	Duration of the Soft Off phase (t3) 0 sec. = switch off immediately **IMPORTANT**: For further information refer to the appendix: Retriggering and premature switch-off
Forced mode function	**No forced mode function** Forced mode through dimming value (0 = inactive) Activate forced mode with 1 Activate forced mode with 0	Forced mode object not present Forced mode is triggered by one-byte telegram with dimming value (see Forced operation object) Activation via 1-bit object 1 = active / 0 = inactive 0 = active / 1 = inactive

Continuation:

Designation	Values	Application
Behaviour at start of forced mode	**Minimum brightness** 100 % Off 10 %, 20 %, 30 % 40 %, 50 %, 60 % 70 %, 80 %, 90 %	Response to the receipt of a forced mode telegram Here again the configured minimum brightness needs to be taken into account.
Behaviour at end of forced mode	**Value before forced mode** Minimum brightness 100 % Off 10 %, 20 %, 30 % 40 %, 50 %, 60 % 70 %, 80 %, 90 %	Response to cancellation of forced mode Here again the configured minimum brightness needs to be taken into account.
Diagnosis and feedback	 **None** Feedback object, status, general error Load failure, feedback objects, status, general error Excess temperature, feedback objects, status, general error Short circuit, feedback objects, status, general error R,C/L load, feedback objects, status, general error Bus/manual, feedback objects, status, general error	Function of the feedback objects + specific feedback via object 8 Do not send any diagnosis or feedback telegrams. Objects 5 .. 9 are hidden. Object 5: Dimming value feedback Object 6: ON/OFF status feedback Object 7: General error message Object 8: Not used Object 9: Status As above, only obj.8 Error message: Failure of power unit as above, only obj.8 Error message overloading of 1-10 V connection as above, only obj.8 Error message: Internal error As above, only obj.8 Error message: No mains supply or no load connected to relay. The channel LED flashes slowly as above, only Object 8: Bus/manual mode feedback
Sending diagnosis and feedback	**only at change** cyclically and at change	Only to be sent when something has changed To be sent at regular intervals and again after a change

4 Application in a MIX2 system

A **MIX 2 device** (order no. 493…) can accept any number of **MIX upgrade devices** (order no. 491…).

The object numbers and the allocation of parameters can vary from the original MIX applications.

Note:
MIX 2 upgrade devices (order no. 493…) can only work in combination with a MIX 2 basic device (order no. 493…).

4.1 Characteristics of the communications objects

Table 1

Object	Function	Object name	Type	Response
80	*Switching ON/OFF*	*GM DMG2S / SMG2S channel 1*	1 bit	Receive
81	*Brighter / darker*	*GM DMG2S / SMG2S channel 1*	4 bits	Receive
82	*Dimming value*	*GM DMG2S / SMG2S channel 1*	1 byte	Receive
83	*Soft switch*	*GM DMG2S / SMG2S channel 1*	1 bit	Receive
84	*Compulsory operation ON/OFF* *Dimming value for compulsory operation*	*GM DMG2S / SMG2S channel 1*	1 bit 1 byte	Receive
85	*Feedback in %*	*GM DMG2S / SMG2S channel 1*	1 byte	Send
86	*Feedback On/Off*	*GM DMG2S / SMG2S channel 1*	1 bit	Send
87	*General error message*	*GM DMG2S / SMG2S channel 1*	1 bit	Send
88	*Load failure message* *Excess temperature message* *Short circuit message* *Load type message (R, C/L)* *Bus/manual operation message*	*GM DMG2S / SMG2S channel 1*	1 bit	Send
89	*Status message (bit set)*	*GM DMG2S / SMG2S channel 1*	1 byte	Send
90-99 and 160-179: For all additional channels including second DME 2 S / SME 2 S upgrade module				
Central objects				
240	*Switching ON/OFF*	*Central continuous ON*	1 bit	Receive
241	*Switching ON/OFF*	*Central continuous OFF*	1 bit	Receive
242	*Switching ON/OFF*	*Central switching*	1 bit	Receive
243	*Call/save scene*	*Scene*	1 byte	Receive

4.2 Description of objects

- **Objects 80, 90, 160, 170** *"""" Switching ON/OFF"*

A 1 on this object dims up to 100%,
and 0 dims to 0%

- **Objects 81, 91, 161, 171** *"brighter/darker"“*

This object is actuated with 4-bit telegrams (EIS 2 relative dimming).
This function can be used to dim the light up or down in increments (with 1...64 increments)
.
In the standard application, telegrams are sent with 64 increments.
IMPORTANT: The response to 4-bit telegrams depends on the
“Switching On/Off with a 4-bit telegram” parameter.

- **Objects 82, 92, 162, 172** *"Dimming value"*

This object can be used to select the desired dimmer setting directly.
Format: 1 byte percentage value EIS 2 dimming, value.
0 = 0%
255 = 100%

- **Objects 83, 93, 163, 173** *"Soft switching"*

A “1” on this object starts a soft switching cycle, i.e.:
The brightness is gradually increased, starting from the minimum brightness.
The dimming value remains constant for the programmed time and is then gradually reduced after this time has elapsed.
Once the programmed minimum brightness has been reached the dimming value is reset to 0%.
The cycle can be extended or prematurely terminated via telegrams.

This sequence can also be controlled using a **time switch** if the "*Time between soft ON and soft OFF*" parameter is set to "*Until soft OFF telegram*".
The dimming cycle is then started with a “1” and finished with a “0”.

- **Objects 84, 94, 164, 174** *"Compulsory operation = 1" / "Compulsory operation = 0" / "Compulsory operation via dimming value"*

The function of the compulsory operation object can be configured as a 1-bit or 1-byte object.

Table 2

<table>
<tr><th rowspan="2">Configuration</th><th colspan="2">Compulsory operation</th><th colspan="2">Response with compulsory operation</th></tr>
<tr><th>Trigger with</th><th>End with</th><th>Start</th><th>Ends</th></tr>
<tr><td>As 1-bit object</td><td>1 or 0 (configurable)</td><td>0 or 1 (configurable)</td><td colspan="2">Configurable in the application program</td></tr>
<tr><td>As 1-byte object</td><td>1 ... 255</td><td>0</td><td>The triggering telegram also acts simultaneously as a compulsory operation dimming value.</td><td>The last dimming value before compulsory operation is restored.</td></tr>
</table>

- **Objects 85, 95, 165, 175** *"Feedback in %“*

Sends the new dimming value after a change as soon as a dimming procedure is completed, i.e. once the new set point value has been reached.
Format: 1 byte, 0 ... 255 i.e. 0 ... 100%

IMPORTANT:
This object must not be placed in the same group address as object 82.

- **Objects 86, 96, 166, 176** *" Feedback On/Off"*

Sends the current dimming status:
1 = current dimming value is between 1% and 100%
0 = current dimming value is 0%

- **Objects 87, 97, 167, 177** *"General error message"*

Used as a malfunction signal:
0 = No error
1 = an error has been detected

This message can be displayed on a screen.
For detailed error analysis, see Object 89.

- **Objects 88, 98, 168, 178** *"Load failure message", "Excess temperature message", "Short circuit message"“, "Load type message (R, C/L)", "Bus/manual mode operation"*

The function of this object is dependant on the "Diagnosis and feedback" parameter and the device type (DME 2 S or SME 2 S).
This allows a more specific error message.

Table 3: DME 2 S

“Diagnosis and feedback” parameter	Function of object 88	Application
Feedback objects, status, general error	-	-
Load failure, feedback objects, status, general error	Load failure message	1= open circuit, failure of light source,[1], automatic circuit-breaker tripped or no load connected.
Excess temp., feedback objects, status, general error	Excess temperature message[2]	1= the dimmer is overloaded: • connected power is too high, • ambient temperature is too high, • incorrect installation position, i.e. device cannot dissipate the heat, • booster defective.
Short circuit, feedback objects, status, general error	Short circuit message	1= check connected lines and load
R,C/L load, feedback objects, status, general error	Load type message (R, C/L)	1= Reverse phase control: With a resistive or capacitive loads (R/C), e.g. electronic transformers or incandescent lamps. 0= phase control: With inductive loads, e.g. conventional transformers.
Bus/manual, feedback objects, status, general error	Bus/manual operation message	Indicates whether the switch on the dimmer housing is set to bus operation or not. 1 = manual operation (manual 0 or manual 1 position) 0 = bus (bus position)

[1] Failed light sources can only be detected if the current supply for 230V is effectively interrupted (halogen spot lamps or normal incandescent bulbs). If light sources are connected in parallel or there is a load failure on the 12V secondary side of a transformer then the system does not detect a load failure.

[2] This telegram should not be used to determine the maximum dimmable power in an application.

Table 4: SME 2 S

“Diagnosis and feedback” parameter	Function of object 88	Application
Feedback objects, status, general error	-	-
Load failure, feedback objects, status, general error	Load failure message	No voltage supply to terminals 1-2
Excess temp., feedback objects, status, general error	Excess temperature message	Overload of 1-10 V connection. The channel is dimmed up to 100% and the status LED flashes rapidly.
Short circuit, feedback objects, status, general error	Short circuit message	SMG 2 / SME 2: Internal error. The status LED flashes rapidly and slowly in turn.
R,C/L load, feedback objects, status, general error	Load type message (R, C/L)	No mains connection or no load connected to relay, no measurable voltage between terminals 3-4 or 7-8. The status LED flashes slowly (once a second).
Bus/manual, feedback objects, status, general error	Bus/manual operation message	Indicates whether the switch on the dimmer housing is set to bus operation or not. 1 = manual operation (manual 0 or manual 1 position) 0 = bus (bus position)

• **Objects 89, 99, 169, 179** *"Bit set status message"*

Diagnosis object for status and error display.
The relevance of the individual bits is dependent on the device type (DME 2 S or SME 2 S).

Status information is encoded in one byte according to the following bit pattern.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
n.a.	n.a.	x	x	x	x	x	x

x = value 1 or 0

Table 5: DME 2 S

	Bit	Name	Application
Error	0	Load failure	1= open circuit, automatic circuit-breaker tripped or no load connected.
	1	Excess temperature	1= the dimmer is overloaded: connected power is too high, ambient temperature is too high, incorrect installation position, i.e. device cannot dissipate the heat, booster defective.
	2	DME 2 S Short circuit	1= check connected lines and load
Status	3	Type of load	1= reverse phase control (R, C load connected), electronic transformers or incandescent lamps test 0= phase control (L load connected), conventional transformers
	4	Manual/bus operation	1= manual switch on the device set to manual operation “0” or “1” 0= manual switch set to bus operation
	5	Dimming value	1= dimming value >0% 0= Dimming value = off

Table 6: SME 2 S

	Bit	Name	Application
Error	0	Load failure	No voltage supply to terminals 1-2
	1	Excess temperature	Overload of 1-10 V connection
	2	Short circuit	Internal error
Status	3	Type of load	No mains connection or no load connected to relay, no measurable voltage between terminals 3-4 or 7-8. The channel LED flashes slowly
	4	Manual/bus operation	1= manual switch on the device set to manual operation “0” or “1” 0= manual switch set to bus operation
	5	Dimming value	1= dimming value >0% 0= Dimming value = off

- **Object 240** *"Central continuous On"*

This object is a central object. It can be configured to work on all channels.
If this object is set to "1" all of the channels "participating" in this object are dimmed "Participate" object to 100%.
If this object is set to "0" it does not effect the channels.

- **Object 241** *"Central continuous Off"*“

This object is a central object. It can be configured to work on all channels.
If this object is set to "1" all of the channels "participating" in this object are dimmed "Participate" object to 0%.
If this object is set to "0" it does not effect the channels.

- **Object 242** *"Central switching"*

This object is a central object. It can be configured to work on all channels.
If a "1" or "0" is sent to this object then this is the same as if a "1" or "0" is sent to the switching objects of the channels (Object 80, Object 90, ...). The same functionality could also be achieved by connecting all switching objects to the same group as that of this object. Accordingly, using this object saves time during the assignment of the group addresses and also saves on the number of associations.

- **Object 243** *"Call/save central scenes"“*

This object can be used to save and subsequently call "scenes".
The save process stores the current status of the dimming channel, regardless of how the status was brought about (e.g. via dimming values, switching commands, central objects or the manual switches).
The saved status is thus restored when called up.
Each channel can participate in a maximum of 8 scenes.

The following telegrams need to be sent in order to call or save scenes:

Table 7

Function	Value hexadecimal	Decimal value	Function
Save scene 1	$80	128	Each channel saves its current dimming value in the scene memory with the sent scene number, provided the channel is intended to participate in this scene. This scene memory remains alive even after bus failure or mains failure.
Save scene 2	$81	129	
Save scene 3	$82	130	
Save scene 4	$83	131	
Save scene 5	$84	132	
Save scene 6	$85	133	
Save scene 7	$86	134	
Save scene 8	$87	135	
Call scene 1	$00	0	Each channel adopts the dimming value stored in the scene memory under the sent scene memory, provided the channel is intended to take part in this scene.
Call scene 2	$01	1	
Call scene 3	$02	2	
Call scene 4	$03	3	
Call scene 5	$04	4	
Call scene 6	$05	5	
Call scene 7	$06	6	
Call scene 8	$07	7	

4.3 Parameter overview

Each channel has up to 7 parameter pages, and all channels have an identical layout.

Table 8

Function	Description
DMG 2S / SMG 2 S C1: Function selection	Set basic functions of channel.
Dimming response	Load selection, dimming times etc.
Soft dimming	Soft dimming times
Compulsory operation	Response for compulsory operation
Scenes	Participation in scenes
Feedback	Diagnosis and feedback messages
Loss of power and restoration	Response for loss of bus power and restoration of power.

4.3.1 The parameter page *"DMG 2S / SMG 2 S C1: Function selection"*

Table 9

Designation	Values	Description
Activate soft dimming	*No* *Yes*	No soft dimming Fade in soft dimming parameter page
Activate compulsory operation function	*No* *Yes*	No compulsory operation function Fade in compulsory operation parameter page
Participation in scenes	*No* *Yes*	No scenes Fade in scenes parameter page
Participation in central objects	***Yes: in all central objects*** *No: in no central object* *only in central continuous ON* *only in central continuous OFF* *only in central switching* *only in central switching and continuous ON* *only in central switching and continuous OFF* *only in central permanent On and permanent OFF*	Defines which central objects the channel responds to.
Activate feedback messages	*No* *Yes*	No feedback messages Fade in feedback parameter page

4.3.2 The *"Dimming response"* parameter page

Table 10

Designation	Values	Description
Load selection (R, C or L) ONLY for DME 2	***Automatic load detection (standard)***	The dimmer detects what type of load is connected and automatically selects the appropriate dimming strategy (phase control or reverse phase control).
	R, C load (incandescent bulbs, electronic power units)	Phase control for resistive and capacitive loads (incandescent lamps, halogen high-voltage lamps etc.) For electronic transformers/power units designated for use with RC-mode dimmers (phase control/ trailing edge). **CAUTION: Connecting inductive loads (e.g. wound transformer, fan motor) could irreparably damage the dimmer.**
	L load (wound transformers)	Phase control for inductive loads (wound transformers). → With electronic transformers specifically designed for operating L-mode dimmers (phase control/leading edge) this setting can be used to achieve better dimming response.
	Fan (for devices from mid-2006)	Switch on at 100 % before setting value.
	Dimmable Energy saving lamps (device no. 491 0 271)	Only for dimmable energy saving lamps. See DMG 2 S KNX manual.
Minimum brightness	*5%, 10%, 15%, 20% , 25%, 30%,* ***35%****, 40%, 45%, 50%*	Minimum dimming value for all dimming processes (except 0%). Any values (switch-on brightness, response to bus failure etc.) which are below this threshold are increased to the minimum brightness.

Continuation:

Designation	Values	Description
Dimming time from 0% to 100%	*1 sec., 2 sec., 3 sec.* *4 sec.,* ***5 sec.****, 6 sec.* *7 sec., 8 sec., 9 sec.* *10 sec., 11 sec., 12 sec.* *13 sec., 14 sec., 15 sec.* *20 sec., 30 sec., 40 sec.* *50 sec., 60 sec.*	This setting determines the dimming speed for 4-bit telegrams (brighter/darker).
When receiving a dimming value/scene no.	***Soft on with above set dimming time*** *Immediate on*	The dimming time parameter also applies here to the object dimming value. The received dimming value is adopted immediately.
Switch-on brightness	***Brightness value before previous switch-off*** *Minimum brightness* *100 %, 10 %, 20 %* *30 %, 40 %, 50 %* *60 %, 70 % , 80 %,* *90 %*	The last dimming value before switching off is saved and restored. The configured minimum brightness is adopted. The dimmer adopts the selected value after it is switched on. Here again the configured minimum brightness needs to be taken into account.
Switching on/off with a 4-bit telegram	 *No* ***Yes***	Defines the response if the channel is switched off and a 4-bit telegram (brighter/darker) is received. Channel remains switched on or off. Channel is switched on and dimmed or switched off.

4.3.3 The *"Soft dimming"* parameter page

Table 11

Designation	Values	Description
Time for Soft ON	*0 sec., 1 min., 2 min.* *3 min., 4 min., 5 min.* *6 min., 7 min., 8 min.* *9 min., 10 min., 12 min.* *15 min., 20 min., 30 min.* *40 min., 50 min., 60 min.*	Duration of the dimming-up phase (t1) for Soft switching (see appendix). 0 sec. = switch on immediately. **IMPORTANT**: See appendix for further details: Retriggering and premature switch-off
Dimming value after Soft ON	*10 %, 20 %, 30 %, 40 %* *50 %, 60 %, 70 % , 80 %* *90 %,* ***100 %***	Final value at the end of the Soft on phase (val) Note: Here again the configured minimum brightness needs to be taken into account.
Time between Soft ON and Soft OFF	*Until "Soft Off" telegram*	No time restriction; Soft Off phase is initiated by a telegram
	1 sec., 2 sec. *3 sec., 4 sec., 5 sec.* *6 sec., 7 sec., 8 sec.* *9 sec., 10 sec., 15 sec.* *20 sec., 30 sec., 40 sec.* *50 sec., 1 min., 2 min.* *3 min., 4 min.,* ***5 min.*** *6 min., 7 min., 8 min.* *9 min., 10 min., 12 min.* *15 min., 20 min., 30 min.* *40 min., 50 min., 60 min.*	Delay (t2) to the start of the Soft Off phase
Time for Soft OFF	*0 sec., 1 min., 2 min.* *3 min., 4 min., 5 min.* *6 min., 7 min., 8 min.* *9 min., 10 min., 12 min.* *15 min., 20 min., 30 min.* *40 min., 50 min., 60 min.*	Duration of the Soft Off phase (t3) 0 sec. = switch off immediately **IMPORTANT**: See DMG 2 S KNX manual for further details.

4.3.4 The *"Compulsory operation* parameter page

Table 12

Designation	Values	Description
Compulsory operation function	*Compulsory operation through dimming value (0 = inactive)* *Activate compulsory operation with 1* *Activate compulsory operation with 0*	Compulsory operation is triggered by one-byte telegram with dimming value (See Compulsory operation object) Activation via 1-bit object 1 = active / 0 = inactive 0 = active / 1 = inactive
Behaviour at start of compulsory operation	*Minimum brightness* *100 %* *Off* *10 %, 20 %, 30 %* *40 %, 50 %, 60 %* *70 %, 80 %, 90 %*	Response to the receipt of a compulsory operation telegram Here again the configured minimum brightness needs to be taken into account.
Behaviour at end of compulsory operation	*Value before compulsory operation* *Minimum brightness* *100 %* *Off* *10 %, 20 %, 30 %* *40 %, 50 %, 60 %* *70 %, 80 %, 90 %*	Response to cancellation of compulsory operation Here again the configured minimum brightness needs to be taken into account.

4.3.5 The *"Scenes"* parameter page

Table 13

Designation	Values	Description
Participation in scene 1	***No*** *Yes*	Which scenes numbers should the channel react to (save/restore)?
Participation in scene 2	***No*** *Yes*	
Participation in scene 3	***No*** *Yes*	
Participation in scene 4	***No*** *Yes*	
Participation in scene 5	***No*** *Yes*	
Participation in scene 6	***No*** *Yes*	
Participation in scene 7	***No*** *Yes*	
Participation in scene 8	***No*** *Yes*	

4.3.6 The *"Feedback"* parameter page

Table 14: DME 2 S

Designation	Values	Description
Diagnosis and feedback		Function of the feedback objects + specific feedback via Object 88
	none	Do not send any diagnosis or feedback telegrams. Objects 85 .. 89 are hidden.
	Feedback object, status, general error	Object 85: Dimming value feedback Object 86: ON/OFF status feedback Object 87: General error message Object 88: Not used Object 89: Status
	Load failure, feedback objects, status, general error	as above, only Object 88 Load failure error message
	Excess temperature, feedback objects, status, general error	as above, only Object 88 Excess temperature error message
	Short circuit, feedback objects, status, general error	as above, only Object 88 Short circuit error message
	R,C/L load, feedback objects, status, general error	as above, only Object 88 Load type feedback
	Bus/manual, feedback objects, status, general error	as above, only Object 88 Bus/manual operation feedback
Send diagnosis and feedback cyclically	*only at change*	Only to be sent when something has changed
	cyclically and at change	To be sent at regular intervals and again after a change. The cycle time is set on the first parameter page (→*General)*: *Time for cyclical sending of feedback object (MIX series, order no.491...)*

Table 15: SME 2 S

Designation	Values	Description
Diagnosis and feedback		Function of the feedback objects + specific feedback via Object 88
	none	Do not send any diagnosis or feedback telegrams. Objects 85 .. 89 are hidden.
	Feedback object, status, general error	Object 85: Dimming value feedback Object 86: ON/OFF status feedback Object 87: General error message Object 88: Not used Object 89: Status
	Load failure, feedback objects, status, general error	as above, only object 88 error message: Failure of power unit
	Excess temperature, feedback objects, status, general error	as above, only Object 88 Error message overload of 1-10 V connection
	Short circuit, feedback objects, status, general error	as above, only Object 88 error message: Internal error
	R,C/L load, feedback objects, status, general error	as above, only object 88 error message: No mains supply or no load connected to relay. The channel LED flashes slowly.
	Bus/manual, feedback objects, status, general error	as above, only Object 88 Bus/manual operation feedback
Send diagnosis and feedback cyclically	***only at change***	Only to be sent when something has changed
	cyclically and at change	To be sent at regular intervals and again after a change

4.3.7 The *power loss and restoration* parameter page

Table 16

Designation	Values	Description
Dimming value after loss of bus power	***No change*** *Minimum brightness* *100 %* *Off* *10 %, 20 %, 30 %* *40 %, 50 %, 60 %* *70 %, 80 %, 90 %*	How should the dimmer respond if the bus voltage fails and controls via the bus are therefore no longer available? Here again the configured minimum brightness needs to be taken into account.
Dimming value after restoration of bus or mains power	*Same as before bus failure* *Minimum brightness* *100 %* *OFF* *10 %, 20 %, 30 %* *40 %, 50 %, 60 %* *70 %, 80 %,* ***90 %***	How should the dimmer react when normal operation is restored (bus and mains supply available)? Here again the configured minimum brightness needs to be taken into account.

5 APPENDIX

5.1 Error messages via the status LEDs

During normal operation the status LEDs are either off (0 %) or on (1…100 %).
Errors are reported via different flashing responses.

Response	Cause	Remedy
LED flashes slowly once a second	No mains supply to relay or no measurable voltage between the relay terminals (terminals 3-4 or 7-8). Or too small a load is connected.	Check connections
LED flashes very fast	Excess temperature. The 0-10 V connection is overloaded.	Reduce number of series devices.
LED flashes slowly and rapidly in turn	Internal error	Device must be replaced.

5.2 Applications for the "Soft switching" function

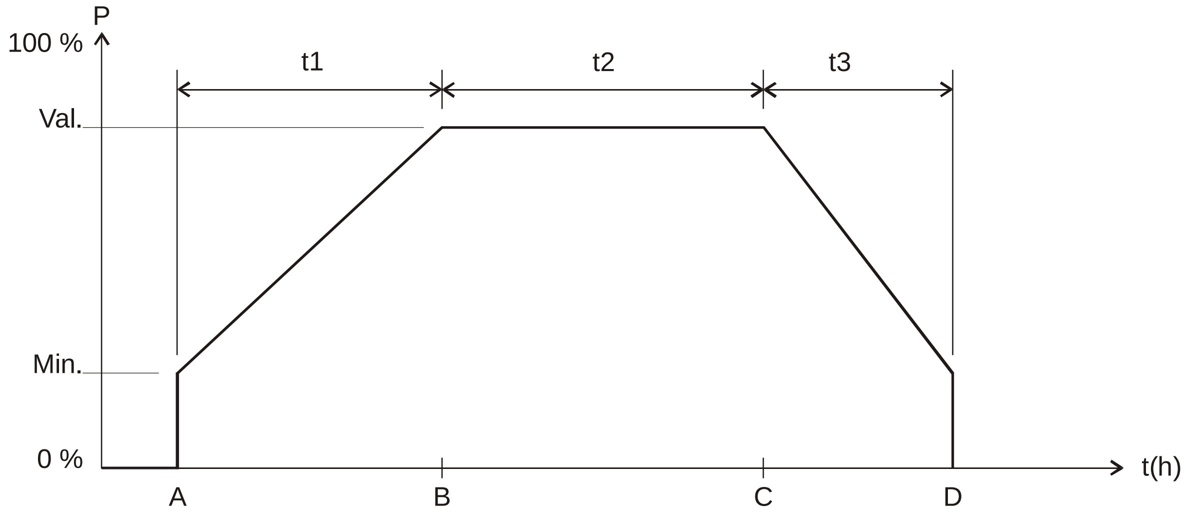
5.2.1 General

The Soft switch function is a cycle consisting of switch- on, dimming up, maintain target brightness, dimming down and switch-off.

5.2.2 Simulation of a daily routine

Using a timer, it is possible to simulate an entire daily routine with sunrise and sunset. To do this, the parameter "Time between Soft ON and Soft OFF" needs to be set to "Until Soft Off telegram" (see object 3, Soft switching).

The timer sends object 3 a Soft On telegram (=1) in the morning and a Soft Off telegram (=0) in the evening.



Sequence:

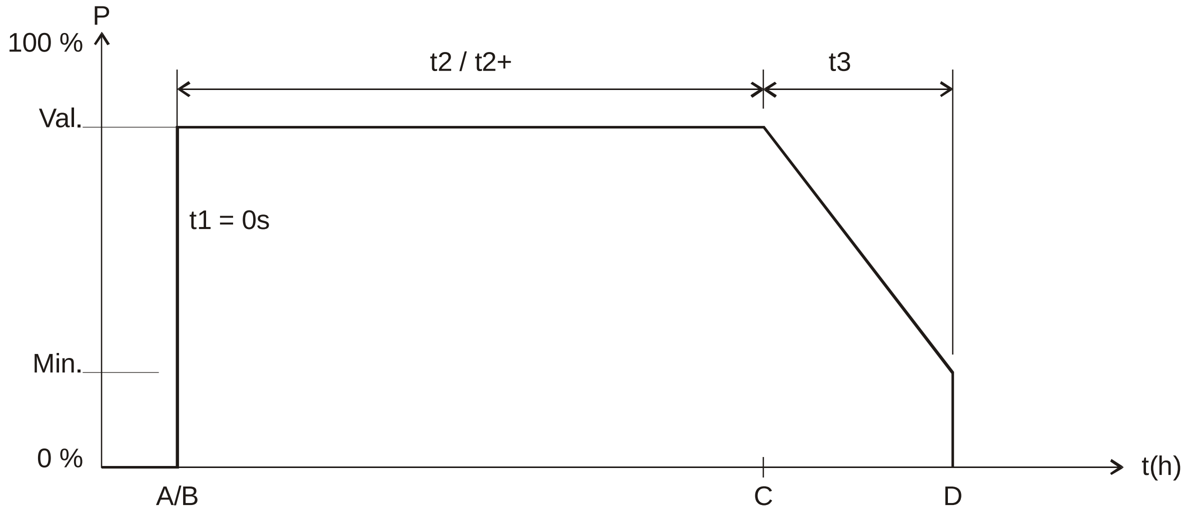
A	*Soft ON* sent by the timer: The brightness is adjusted to the configured *minimum brightness*
t1	The brightness is gradually increased within the configured time for *Soft On.*
B	Configured value after *Soft On* is reached.
t2	Time programmed in the timer between *Soft On* (1) and *Soft Off* telegram (0)
C	*Soft Off* telegram has been received: Start of the *Soft Off* phase
t3	The brightness is gradually reduced within the configured time for *Soft Off.*
D	t3 has elapsed, the configured *minimum brightness* has been reached and the system dims to 0%.

Key

Min.	Configured *minimum brightness*
Val.	Target brightness, i.e. configured *dimming value after Soft On*
t(h)	Time

5.2.3 Soft ON for staircase lighting

The following function is recommended for staircase lighting:
When the light switch is operated: Full brightness.
After expiry of the desired time: Lighting is slowly dimmed down and then switched off.



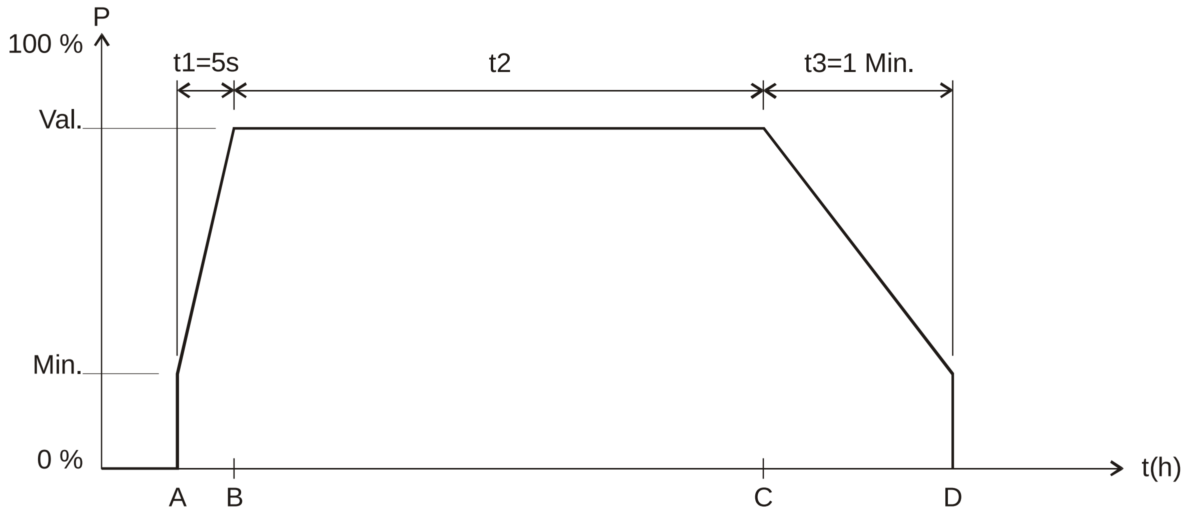
A	Switch sends a *Soft ON* telegram.
t1	The *Soft On* time is equal to 0, i.e. the “Dim up slowly“ function is deactivated.
B	The brightness is immediately adjusted to the configured value after *Soft On.*
t2	Configured time between *Soft On* and *Soft Off** elapses.
t2+	It is possible for t2 to be extended with another *Soft ON* telegram.
C	t2 or t2+ has elapsed, or a *Soft Off* telegram was received: Start of the *Soft Off* phase
t3	The brightness is gradually reduced within the configured time for *Soft Off.*
D	t3 has elapsed, the configured *minimum brightness* has been reached and the system dims to 0%.

* *Soft Off* via configured time or via *Soft Off* telegram.

The light can be turned off with a Soft Off telegram or
retriggered with a Soft On telegram.

5.2.4 Entrance lighting

A motion detector activates the dimmer via the soft switching object.
If a motion is reported then the lighting is dimmed up within 5 seconds.
This delay gives the eyes enough time to adjust to the light without being dazzled.
After the configured time has elapsed or a Soft Off telegram is received via the switch or via the motion detector (cyclic), the lighting is gradually dimmed down within a minute and then switched off.



Sequence:

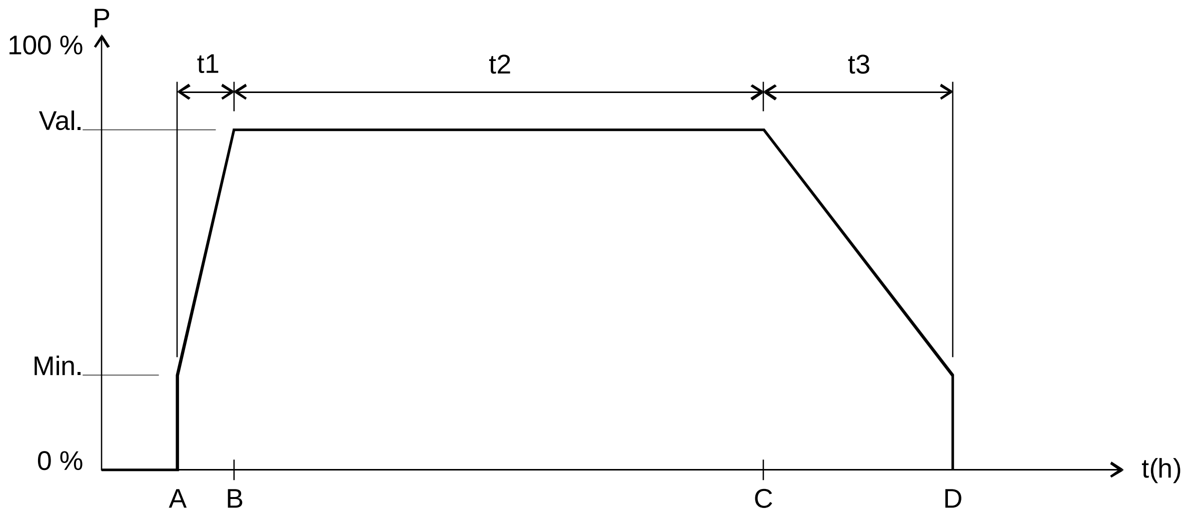
A	*Soft ON* is sent by the motion detector: The brightness is adjusted to the configured *minimum brightness*
t1	The brightness is gradually increased within the configured time for *Soft On* (5s).
B	Configured value after *Soft On* is reached.
t2	Time between *Soft On (1)* and *Soft Off*
C	*Soft Off* telegram was received or configured time has elapsed: Start of the *Soft Off* phase
t3	The brightness is gradually reduced within the configured time for *Soft Off*.
D	t3 has elapsed, the configured *minimum brightness* has been reached and the system dims to 0%.

5.2.5 Retriggering and premature switch-off

It is also possible to influence the soft switching process while it is still active. Depending on which phase is currently being executed, the following responses can be triggered by Soft ON and Soft OFF telegrams.

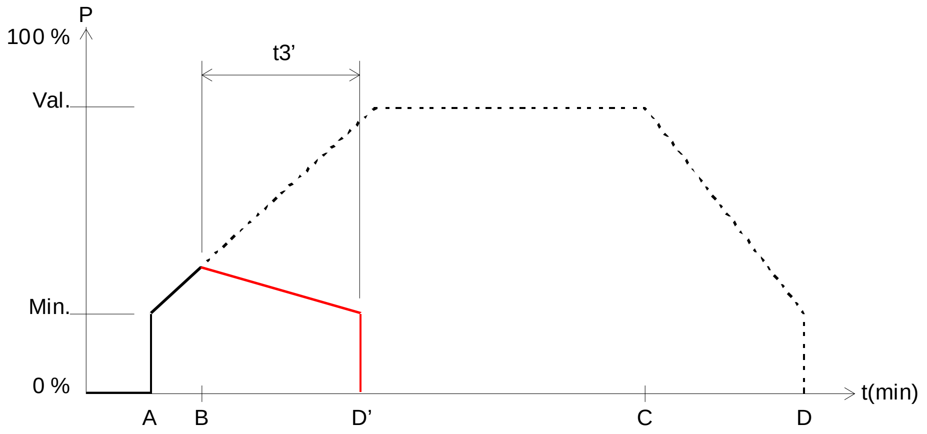
Table 12

Telegram	Response
Soft ON during t1	None
Soft ON during t2	t2 is restarted
Soft ON during t3	A new Soft On process is started. See below.
Soft OFF during t1	The Soft ON process is stopped and the Soft OFF phase started immediately. See below.
Soft OFF during t2	The Soft Off phase starts immediately.
Soft OFF during t3	None

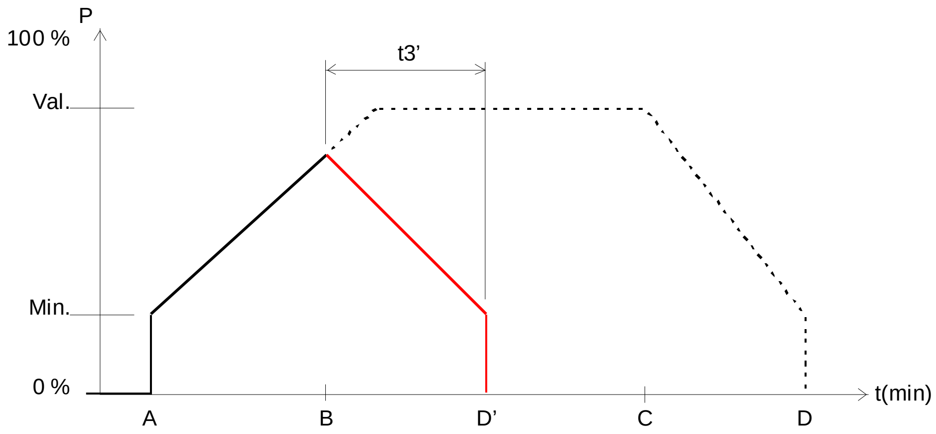


5.2.5.1 Soft Off telegram during a Soft on process

The duration of the Soft Off phase (t3’) is also equivalent to the configured time independent of the current dimming value.



Example 1: Soft Off at the start of the Soft on phase.



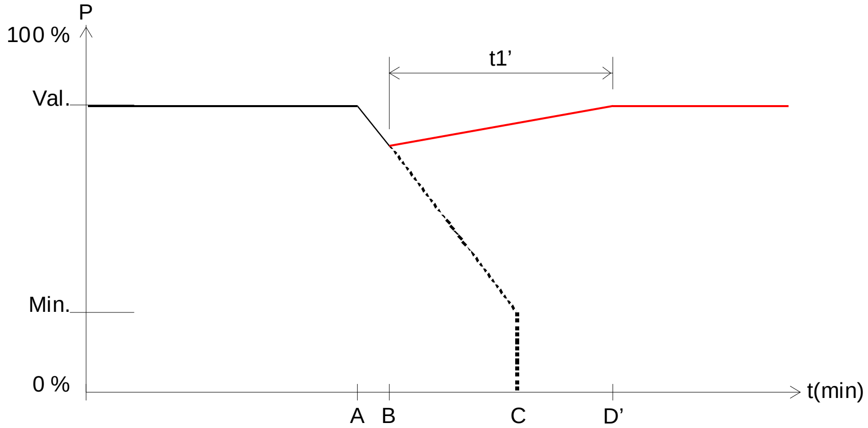
Example 2: Soft Off at the end of the Soft On phase.

Sequence:

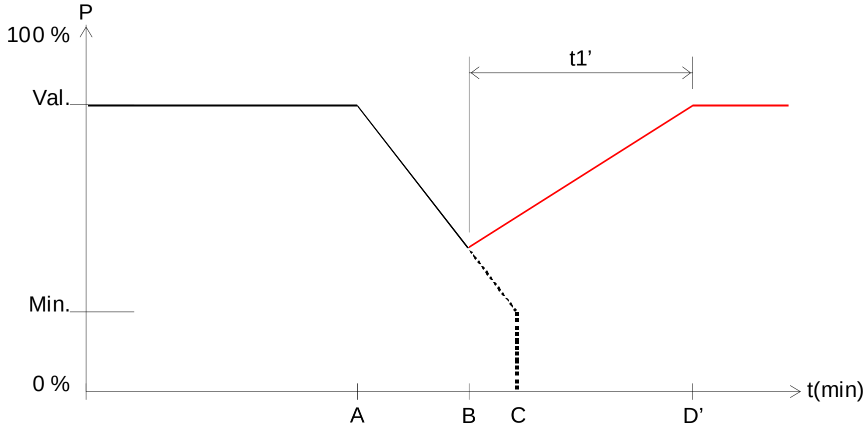
A	A Soft On process is started.
B	A Soft Off telegram is received: The Soft on phase is interrupted and a Soft Off phase starts.
t3	Duration of the Soft Off phase = configured Soft Off time
D	End of the Soft Off phase

5.2.5.2 Soft On telegram during a Soft Off process

The duration of the Soft On phase (t1’) is always equivalent to the configured time regardless of the current dimming value.



Example 3: Soft On at the start of the Soft Off phase.



Example 4: Soft On at the end of the Soft Off phase.

Sequence:

A	A Soft Off process is started.
B	A Soft On telegram is received: The Soft Off phase is interrupted and a Soft On phase starts.
t1	Duration of the Soft On phase = configured Soft On time
D	End of the Soft On phase

5.3 4-bit telegrams (brighter/darker)

5.3.1 4-bit EIS 2 telegram format for relative dimming:

Table 13

Bit 3	Bit 2	Bit 1	Bit 0
Direction	Dimming range divided into increments		
	Code	Increments	
Dim up: Dim 1 down: 0	000 001 010 011 100 101 110 111	**Stop** 1 2 4 8 16 32 64*	

*typical application

Examples: 1111 = increase brightness by 64 increments
0111 = darken by 64 increments
1101 = increase brightness by 16 increments

5.3.2 Parameter: "Switching on/off with a 4-bit telegram"

In general, the setting "Yes" is required.
The setting "No" is available for use with special customer requests, e.g. in conference rooms.
The situation is described below.
A whole group of dimmer channels is operated from a switch (4-bit).
A certain lighting situation has been adjusted by a scene or through other means – e.g. channel 1 OFF, channel 2 40%, channel 3 50%. The requirement is to now dim up and increase the brightness of the entire scene, but the channels which are switched off should remain off.
Parameter: "Switching on/off with a 4-bit telegram"
Switch on/off function of 4-bit telegram.

Table 14

Parameter: "Switching on/off with a 4-bit telegram"	4-bit telegram	Dimmer output status	Response
Yes	Brighter / darker	Switched on (1%...100%)	Channel is dimmed in the normal fashion (to 0%* or 100% if applicable).
	Brighter	Off	Channel is switched on and dimmed
No	Brighter / darker	Off	Dimmer stays switched off
	Brighter / darker	Switched on (1%...100%)	Channel is dimmed in range from min. to 100%

* With the 4-bit telegram "Darker", the channel is switched off if the switch/button is kept depressed for longer than approximately 2s when the minimum brightness is reached.

5.4 Conversion of percentages to hexadecimal and decimal values

Table 15

Percentage value	**0%**	**10%**	**20%**	**30%**	**40%**	**50%**	**60%**	**70%**	**80%**	**90%**	**100 %**
Hexadecimal	00	1A	33	4D	66	80	99	B3	CC	E6	FF
Decimal	00	26	51	77	102	128	153	179	204	230	255

All values from 00 to FF hex. (0 to 255 dec.) are valid.

5.5 Application of the forced mode function

Example: Lighting with brightness control during the daytime and minimum lighting during the night.
The brightness controller continuously measures the brightness of the room and actuates the dimmer as required to keep the brightness constant.
A dimming value of 20% is parameterized for forced mode.

In the evening at the close of work, the timer activates forced mode, as a result of which the brightness is dimmed down to 20%.
During the night, the lighting is switched on for a certain period of time by the nightwatchmen via the central continuous ON function.
In the morning at the start of work, the timer cancels the forced mode again and the dimmer is actuated via the brightness control.

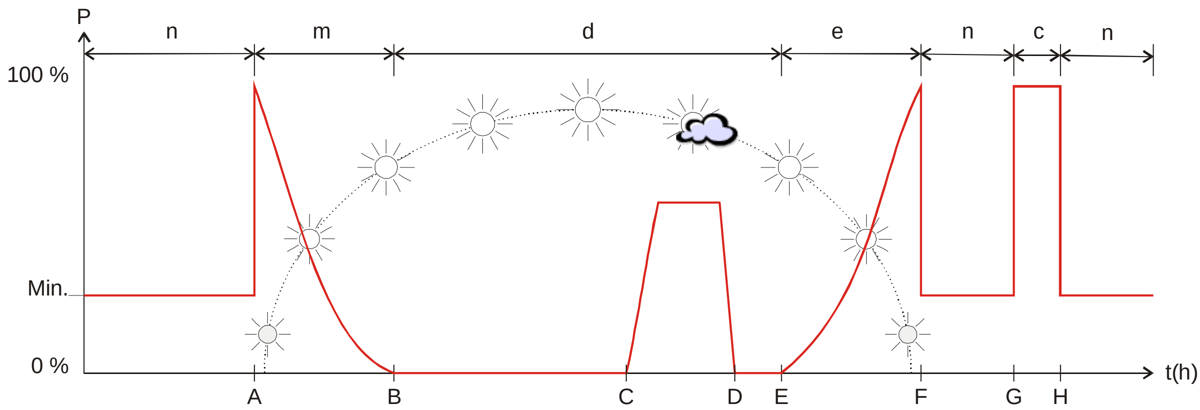


Table 16

A	Forced mode is cancelled by the timer. As the daylight is not yet bright enough the brightness control actuates the dimmer.
B	The daylight is now bright enough to illuminate the room and the dimmer is switched off.
C	Heavy cloud cover, the dimmer compensates for the lack of bright daylight.
D	Clear sunshine, the dimmer is turned back down.
E	Late afternoon, the dimmer gradually replaces the receding daylight.
F	Forced mode is activated by the timer. The dimmer reduces the light to 20%.
G	Central continuous ON = 1
H	Central continuous ON = 0
n	During the night time, the parameterized value for forced mode applies.
c	For the walk around of the nightwatchmen: the lighting is switched on via central continuous ON.
m	Morning: Daylight increases and the brightness control slowly reduces the dimming value.
e	Evening: Daylight decreases and the brightness control slowly increases the dimming value.
d	During the daytime, the dimmer is actuated by the brightness control according to the brightness of the sunlight.

5.6 Store light scenes in one switch

Scenes are normally stored in the SMG 2 S.
Object 63 (scenes) is used for this.

However, if the light scenes ate to be stored **externally**, i.e., for example with a scene-capable switch (e.g. Busch&Jäger Triton), the following steps should be taken:
The SMG2 has one dimming object (dimming value) and one feedback object (feedback in %) per channel.
2 group addresses are used here; hereafter referred to as “Gr.adr.1” and “Gr.adr.2”.

5.6.1 Assignment of group addresses and setting for the object flag

<table>
<tr><th rowspan="2"></th><th rowspan="2">Object</th><th rowspan="2">Connect with</th><th rowspan="2">set to sending</th><th colspan="5">Flags*</th></tr>
<tr><th>K</th><th>L</th><th>S</th><th>T</th><th>A</th></tr>
<tr><td rowspan="2">PUSH BUTTON</td><td rowspan="2">Brightness value telegrams</td><td>Gr.adr.1</td><td>Yes</td><td rowspan="2">✓</td><td rowspan="2">-</td><td rowspan="2">✓</td><td rowspan="2">✓</td><td rowspan="2">x</td></tr>
<tr><td>Gr.adr.2</td><td>No</td></tr>
<tr><td rowspan="3">DIMMER</td><td>Dimming value</td><td>Gr.adr.1</td><td>x</td><td>✓</td><td>-</td><td>✓</td><td>x</td><td>x</td></tr>
<tr><td rowspan="2">Feedback in %</td><td>Gr.adr.1</td><td>No</td><td rowspan="2">✓</td><td rowspan="2">✓</td><td rowspan="2">-</td><td rowspan="2">x</td><td rowspan="2">x</td></tr>
<tr><td>Gr.adr.2</td><td>Yes</td></tr>
</table>

* Object flags: Communication, read, write, transfer, update
x = user-defined

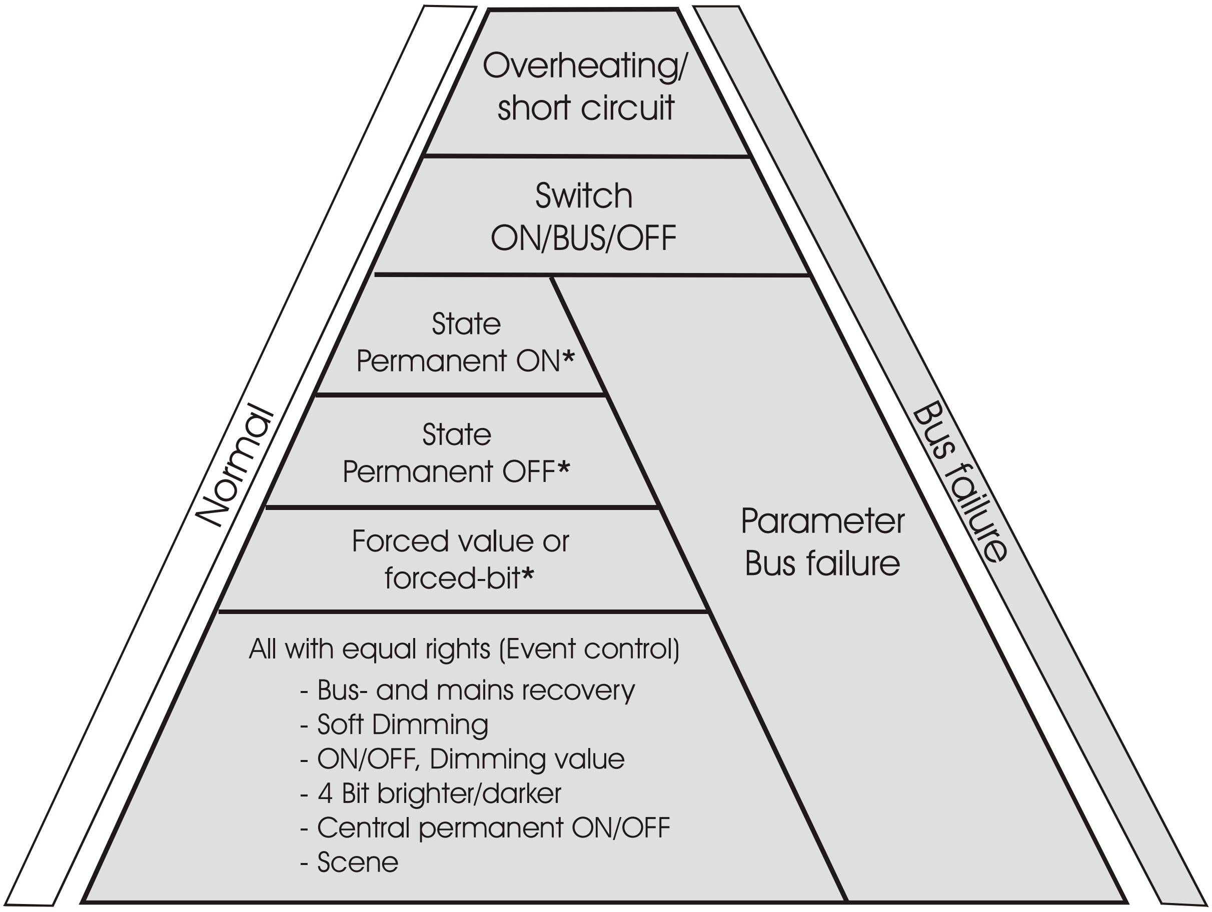
Feedback to the dimmer should **not** be configured for cyclical sending.

5.6.2 Functional description

Saving a scene:
The touch sensor sends a read request to Gr.adr.1 which is only answered by "Feedback in %" object and with Gr.adr.2.
Gr.Adr.2 is not processed by the object "dimming value".
In contrast, the touch sensor receives the value and saves it for the appropriate scene.

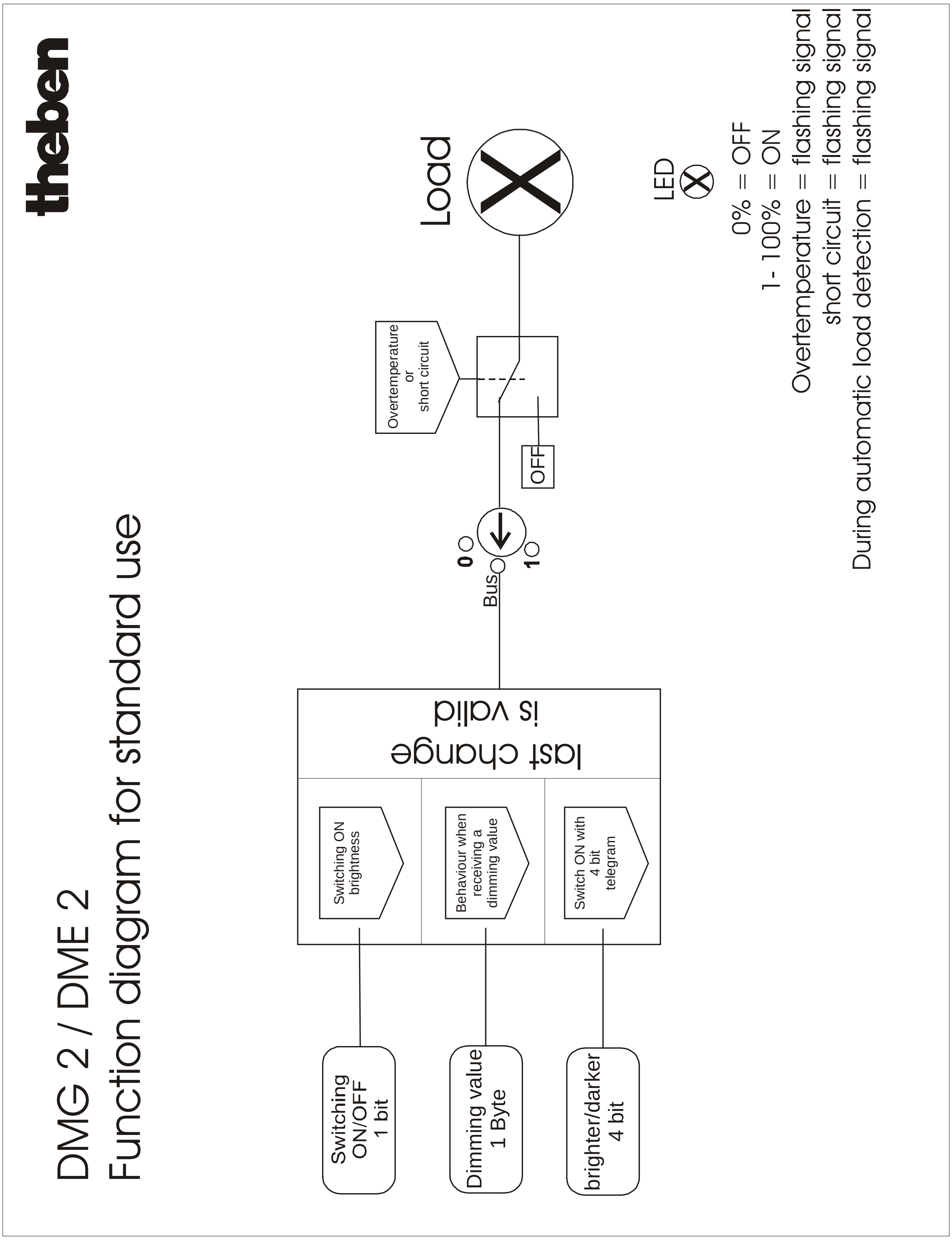
Calling a scene:
The touch sensor sends the value saved for the scene to the % object with the sending address Gr.Adr.1.
The value of the object “dimming value” is further processed to set the output brightness.
Once the dimmer has set the requested value, it sends feedback to the object “Feedback in %” depending on the configuration.

5.7 Dimmer actuator priority sequence



* if parameterized

5.8 Function diagram for standard applications



5.9 General function diagram