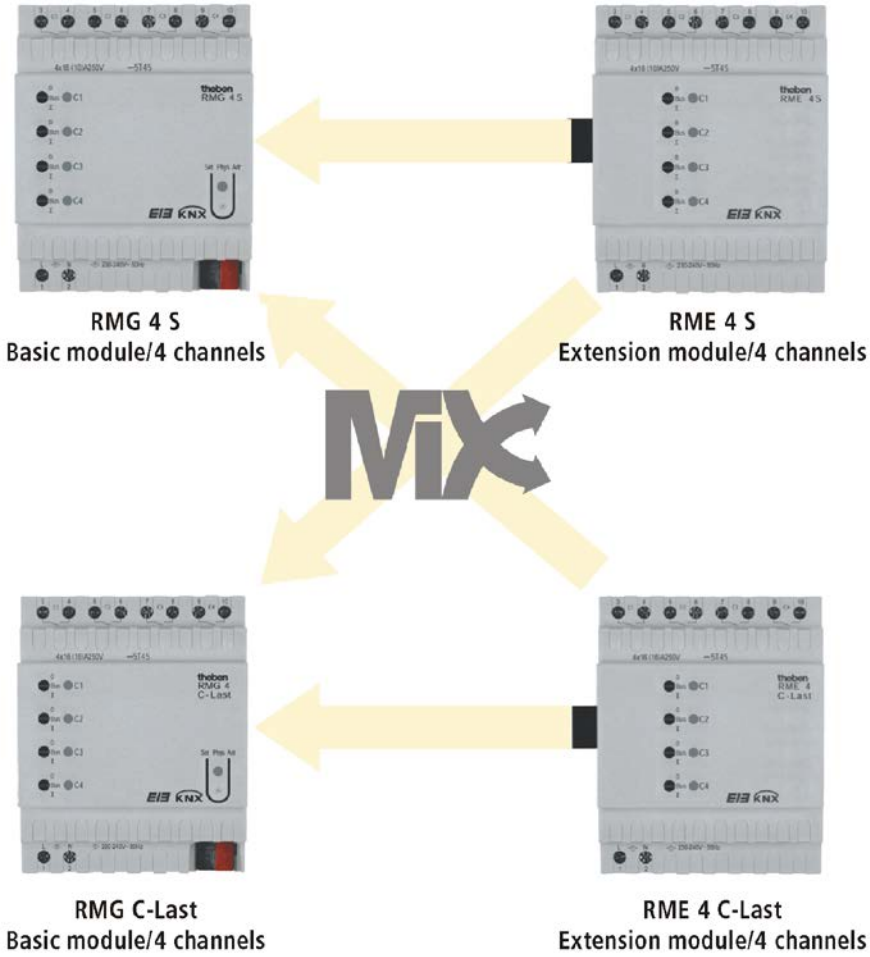
# MX Series Switching Actuators
# RMG 4S
# RME 4 S
# RMG 4 C-Load
# RME 4 C-Load




| | |
|---|---|
| RMG 4 S | 490 0 204 |
| RME 4 S | 490 0 205 |
| RMG 4 C-Last | 490 0 206 |
| RME 4 C-Last | 490 0 207 |

# Contents

# 1 Functional characteristics

The MX Series is a freely configurable range of devices comprising basic modules (e.g. RMG 4 S or RMG 4 C-Load) and extension modules (e.g. RME 4 S or RME 4 C-Load). Up to 2 extension modules of your choice can be connected in series to any of the basic modules in the range.

The **RMG 4 S** basic module is a 4-channel switching actuator with a switching capacity of 16 A per channel for standard load types such as incandescent lamps up to 2300 W, energy saving lamps etc.

The **RME 4 S** extension module is a 4-channel switching actuator with a switching capacity of 16 A per channel for standard load types such as incandescent lamps up to 2300 W, energy saving lamps etc.

The **RMG 4 C-Load** basic module is a 4-channel switching actuator with a switching capacity of 16 A per channel for load types with high switch-on peaks, such as incandescent lamps up to 3680 W, luminous bands, capacitive loads etc.

The **RME 4 C-Load** extension module is a 4-channel switching actuator with a switching capacity of 16 A per channel for load types with high switch-on peaks, such as incandescent lamps up to 3680 W, luminous bands, capacitive loads etc.

Each channel of these switching actuators has an LED which indicates its switching status and a manual switch with the settings ON/OFF/BUS. A mains power supply is required for operation of the manual switch, but the bus voltage does not need to be present. The switching actuators can adopt a parameterized status within 1 second of the mains power being restored, and are therefore suitable for use in installations according to VDE 0108.
Features which can be adjusted via parameter settings including the basic functions of “switching”, “delayed switching" and “pulse function”. In addition, the following can be parameterized for each channel: links, type of contact (NC/NO) and participation in central commands such as continuous ON, continuous OFF, central switching and save/recall scene.

## 1.1 Operation

Turning the manual switch to "0" opens the relay contact irrespective of all other parameters, and the status LED for the channel is switched off.
Turning the manual switch to "1" closes the relay contact irrespective of all other parameters, and the status LED for the channel turns red.
Turning the manual switch to the "Bus" setting allows you to control the relay contact via the bus. The status LED for the channel lights up red if the contact is closed and goes out if the contact is open. A mains power supply is required for operation of the manual switches and the LEDs, but the bus voltage is not required.

## 1.2 Features of the switching actuators

- Manual switch for each channel
- Status LED for each channel
- High switching capacity
- Extensionable modular concept for a variety of applications
- Extensionable to 12 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
- 4 different channel functions can be selected:
  - Switching
  - Switching with ON/OFF time delay
  - Pulse function
  - User-friendly staircase light timer with switch-off pre-warning
- Possible integration of the channels into a maximum of 8 scenes
- Adjustable response to bus failure and restoration of the bus/mains power
- Can be used in installations according to VDE 0108
- Logical functions

# 2 Technical data

## 2.1 Technical data for RMG 4 S and RME 4 S

| | |
|---|---|
| Voltage supply: | Mains voltage 230 V/ 50 Hz +/- 10 %<br>additional bus voltage for RMG4 S |
| Permitted operating temperature: | -10 °C ...+ 50°C |
| Power draw from the mains supply | 2.5 VA |
| Current draw from bus voltage (for RMG4 S) | Max. 10 mA |
| Bus connection (for RMG4 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) |

**Outputs**

| | |
|---|---|
| Quantity: | 4 |
| Type of contact: | Potential-free 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, cos φ = 1)<br>10 A (250 V AC, cos φ = 0.6) |
| Switching of different phases: | possible |
| Switching of SELV voltages: | Yes, if all channels are connected to SELV |

**Switching capacity**

| | |
|---|---|
| Resistive load: | 3680 W |
| Capacitive load: | max. 42 µF |
| Incandescent lamps: | 2300 W |
| High-voltage halogen lamps | 2300 W |
| Fluorescent lamps, uncorrected: | 26 x 40W, 20 x 58W, 10 x 100W |
| Fluorescent lamps, parallel-corrected: | 10 x 40W (4.7µF), 6 x 58W (7.0µF), 2 x 100W (18µF) |
| Fluorescent lamps, DUO switching (conventional ballast): | 10 x (2 x 58 W), 5 x (2 x 100 W) |
| Energy saving fluorescent lamps: | |
| - with electronic ballast QTEC 1 x 58 (Osram) | 12 x 58 W |
| - with electronic ballast QTEC 1 x 36 (Osram) | 9 x 36 W |
| - with electronic ballast QTEC 2 x 58 (Osram) | 7 x (2 x 58W) |
| - with electronic ballast QTEC 2 x 36 | 5 x (2 x 36W) |

| | |
|---|---|
| (Osram) | |
| - with electronic ballast HF 450-1 1 x 58 (Osram) | 7 x 58 W |
| - with electronic ballast HF 432-1 1 x 36 (Osram) | 13 x 36 W |
| - with electronic ballast HF 450-2 2 x 58 (Osram) | 4 x (2 x 58W) |
| - with electronic ballast HF 432-2 2 x 36 (Osram) | 9 x (2 x 36W) |
| Energy saving compact fluorescent lamps: | |
| - Opal type (conventional ballast) (Osram) | 2300 W |
| - Dulux EL type (electronic ballast) (Osram) | 8 x 7W, 7 x 11W, 7 x 15W, 7 x 20W, 7 x 23W |
| - PLCE type (electronic ballast) (Philips) | 14 x 9W, 13 x 11W, 7 x 23W |
| Mercury vapour lamps: | |
| - Uncorrected: | 6 x 125 W, 3 x 250W |
| - Parallel-corrected: | 4 x 70W (12µF), 4 x 150W (12µF), ), 1 x 250W (30µF |
| Sodium vapour lamps: | |
| - Uncorrected: | 3 x 250W, 1 x 500W |
| - Parallel-corrected: | 2 x 150W (20µF), 1 x 250W (37µF) |

**Response to failure of the voltage supply**

| | |
|---|---|
| Mains voltage: | Relay contacts return to rest position |
| Bus voltage only: | Adjustable |

| | |
|---|---|
| **Response to restoration of the voltage supply** | Adjustable |

## 2.2 Technical data for RMG 4 C-Load and RME 4 C-Load

| | |
|---|---|
| Voltage supply: | Mains voltage 230 V/ 50 Hz +/- 10 %<br>additional bus voltage for RMG4 C-Load |
| Permitted operating temperature: | -10 °C ...+ 50°C |
| Power draw from the mains supply: | 2.5 VA |
| Current draw from bus voltage:<br>(for RMG4 C-Load) | Max. 10 mA |
| Bus connection (for RMG4 SC-Load): | 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) |

**Outputs**

| | |
|---|---|
| Quantity: | 4 |
| Type of contact: | potential-free, normally open |
| 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, cos φ = 1)<br>16 A (250 V AC, cos φ = 0.6) |
| Switching of different phases: | possible |
| Switching of SELV voltages: | Possible provided all 4 outputs can switch SELV |

**Switching capacity**

| | |
|---|---|
| Resistive load | 3680 W |
| Capacitive load | max. 200 µF |
| Incandescent lamps: | 3680 W |
| Fluorescent lamps, uncorrected | 3680 W |
| Fluorescent lamps, parallel-corrected | 2500 W /200 µF |
| Fluorescent lamps, DUO switching | 3680 W |
| Halogen lamps, 230 VAC | 3680 W |
| Low-voltage halogen lamps with transformer | 2000 W |
| Mercury/Sodium vapour lamps uncorrected | 3680 W |
| Mercury/Sodium vapour lamps parallel-corrected | 3680 W/ 200 µF |
| Dulux lamps, uncorrected | 3680 W |
| Dulux lamps, parallel-corrected | 3000 W / 200 µF |

**Response to failure of the voltage supply**

| | |
|---|---|
| Mains voltage: | Relay contacts remain unchanged |
| Bus voltage only: | Adjustable |
| **Response to restoration of the voltage supply** | Adjustable |

# 3 The application program “RMG 4 S MiX”

## 3.1 Selection in the product database

| | |
|---|---|
| **Manufacturer** | THEBEN AG |
| **Product family** | Output |
| **Product type** | MiX Series |
| **Program name** | RMG 4 MiX |

Download the application from: http://www.theben.de

**Table 1**

| | |
|---|---|
| Number of communication objects: | Max. 64 |
| Number of group addresses: | 110 |
| Number of assignments: | 111 |

## 3.2 Communication objects

**Table 2**

| No. | Function | Object name | Type | Behaviour |
|---|---|---|---|---|
| 0 | Switching ON/OFF | BM RMG4 Channel 1 | EIS 1 | Receive |
| 1 | Depending on the function and the linking of the channel<br>• Disable<br>• Input in AND gate<br>• Input 2 in OR gate<br>• Override | BM RMG4 Channel 1 | EIS 1 | Receive |
| 2 | With OR link selected:<br>Input 3 in OR gate | BM RMG4 Channel 1 | EIS 1 | Receive |
| 3 | With OR link selected:<br>Input 4 in OR gate | BM RMG4 Channel 1 | EIS 1 | Receive |
| 4 | Feedback | BM RMG4 Channel 1 | EIS 1 | Send |
| 5- 59 | …. for all channels and modules according to channel 1 of the basic module, see table 3. | | | |
| 60 | Switching ON/OFF | Central continuous ON | EIS 1 | Receive |
| 61 | Switching ON/OFF | Central continuous OFF | EIS 1 | Receive |
| 62 | Switching ON/OFF | Central switching | EIS 1 | Receive |
| 63 | Recall/save scene | Scene | EIS 1 | Receive |

**Table 3**

Comparison table for the individual objects (object numbers) of the channels

| Function of the object | BM ch. 1 | BM ch. 2 | BM ch. 3 | BM ch. 4 | EM1 ch. 1 | EM1 ch. 2 | EM1 ch. 3 | EM1 ch. 4 | EM2 ch. 1 | EM2 ch. 2 | EM2 ch. 3 | EM2 ch. 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Switching ON/OFF | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 |
| Depending on the function and the logic of the channel<br>-Disable<br>-Input in AND gate<br>-Input 2 in OR gate<br>-Override | 1 | 6 | 11 | 16 | 21 | 26 | 31 | 36 | 41 | 46 | 51 | 56 |
| With OR function:<br>Input 3 in OR gate | 2 | 7 | 12 | 17 | 22 | 27 | 32 | 37 | 42 | 47 | 52 | 57 |
| With OR function:<br>Input 4 in OR gate | 3 | 8 | 13 | 18 | 23 | 28 | 33 | 38 | 43 | 48 | 53 | 58 |
| Feedback | 4 | 9 | 14 | 19 | 24 | 29 | 34 | 39 | 44 | 49 | 54 | 59 |

### 3.2.1 Object description

- **Object 0 "Switch ON/OFF"**

This object is the actual input object for channel 1 of the basic module.
It acts on the function selected in the parameter page of the channel.

- **Object 1 "input in AND gate" / "input in OR gate" / “lock” / “enable”**

This object is the second input object for the logic gate of channel 1 of the basic module and acts on the selected logic function.

- **Object 2 "input in OR gate"**

This object is the third input object for the logic gate of channel 1 of the basic module. It only appears if an OR function is selected.

- **Object 3 "input in OR gate"**

This object is the fourth input object for the logic gate of channel 1 of the basic module. It only appears if an OR function is selected.

- **Object 4 "RMG4 channel 1 feedback"**

This object is the output object of channel 1 of the basic module. This object returns the switching status of the channel.

- **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" then all of the channels "participating" in this object are switched on.
If this object is set to "0" then 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" then all of the channels "participating" in this object are switched off.
If this object is set to "0" then 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 5, Object 10 ...). 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 assignments.

- **Object 63 "Recall/save scene"**

This object can be used to save and subsequently recall "Scenes".
The save process stores the status of the channel, regardless of how the status was brought about (e.g. via switching commands, central objects or the manual switches). The saved status is re-established when it is recalled.
Each channel can participate in a maximum of 8 scenes.

Table 4. The following messages need to be sent in order to recall or save scenes:

| Function | Hexadecimal value | Decimal value | Function |
|---|---|---|---|
| Save scene 1 | $80 | 128 | Each channel saves its current status 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 | |
| Recall scene 1 | $00 | 0 | Each channel adopts the status stored in the scene memory under the sent scene memory, provided the channel is intended to take part in this scene. |
| Recall scene 2 | $01 | 1 | |
| Recall scene 3 | $02 | 2 | |
| Recall scene 4 | $03 | 3 | |
| Recall scene 5 | $04 | 4 | |
| Recall scene 6 | $05 | 5 | |
| Recall scene 7 | $06 | 6 | |
| Recall scene 8 | $07 | 7 | |

## 3.3 Parameters

### 3.3.1 Parameter pages

| Function | Description |
|---|---|
| ***General*** | Selection of the connected extension modules and the general parameter for the cyclic sending of feedback |
| ***RMG 4 channel 1*** | Parameter for channel 1 of the basic module. |
| ***RMG 4 channel 2*** | Parameter for channel 2 of the basic module. |
| ***RMG 4 channel 3*** | Parameter for channel 3 of the basic module. |
| ***RMG 4 channel 4*** | Parameter for channel 4 of the basic module. |
| ***EM 1 RME 4 channel 1*** | Parameter for channel 1 of the first extension module. |
| ***EM 1 RME 4 channel 2*** | Parameter for channel 2 of the first extension module. |
| ***EM 1 RME 4 channel 3*** | Parameter for channel 3 of the first extension module. |
| ***EM 1 RME 4 channel 4*** | Parameter for channel 4 of the first extension module. |
| ***EM 2 RME 4 channel 1*** | Parameter for channel 1 of the second extension module. |
| ***EM 2 RME 4 channel 2*** | Parameter for channel 2 of the second extension module. |
| ***EM 2 RME 4 channel 3*** | Parameter for channel 3 of the second extension module. |
| ***EM 2 RME 4 channel 4*** | Parameter for channel 4 of the second extension module. |

Each channel has a parameter page. All pages (and channels) have an identical structure.

The first and most important parameter on a page is the parameter “Function”. This defines the function of the channel.

Possible functions include:

- Switching on/off
- On/off time delay
- Pulse function
- Staircase light timer with pre-warning function

Depending on the function, the parameters listed below may change.

### 3.3.2 The function "Switching on/off"

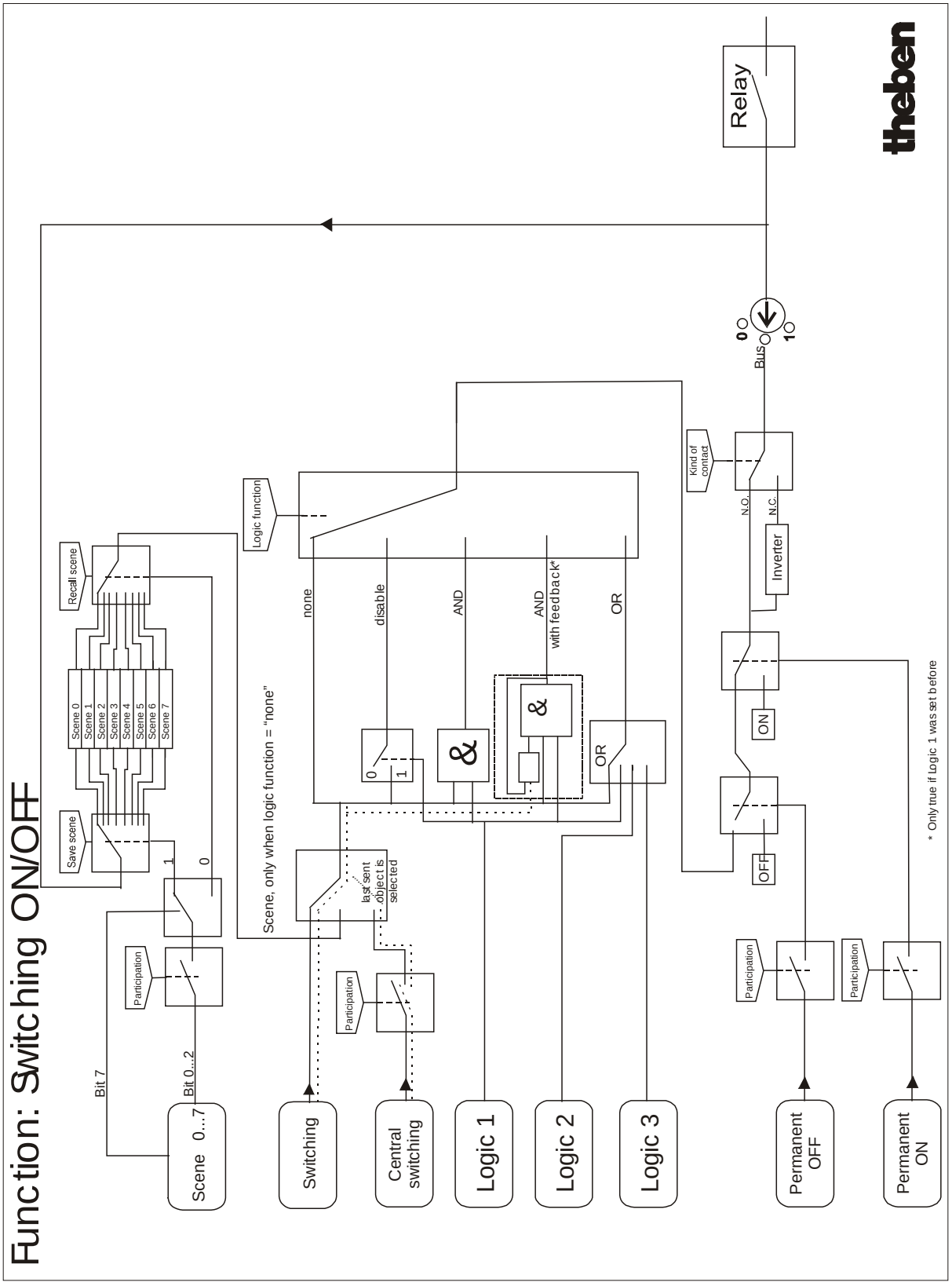
Basic functionality:
If the switching object is set to "1" then the channel is switched on.
If the switching object is set to "0" then the channel is switched off.
If the function "Switching on/off" is selected then the following parameters are available:

**Table 5**

| Designation | Values | Meaning |
|---|---|---|
| Type of contact | **NO contact**<br>NC contact | NO contact: the contact is closed when a switch-on command is present.<br>NC contact: the contact is opened when a switch-on command is present.<br>This parameter only applies to the operation of the bus – the function of the manual switch is not affected by it. |
| Input logic | **None**<br>Disable<br>OR<br>AND<br>Enable | None: The channel has the status according to the switching object.<br>Disable: If the linking object is set to 0 then the contact is in the position according to the switching object. If the linking object is set to "1" then the channel is OFF.<br>OR: If the switching object or at least one of the 3 linking objects is set to "1" then the contact is ON. If none of the 4 input objects are set then the channel is OFF.<br>AND: If the switching object and the linking object are set to "1" then the channel is ON.<br>Enable: If the linking object is set to "1" and **afterwards** the switching object is set to "1" then the channel switches ON. If one of the objects is set to "0" or the switching object is set to "1" first (before the linking object) then the channel is OFF. |

Continued

| Designation | Values | Meaning |
|---|---|---|
| Participation in central objects | **Yes, in all central objects**<br>No, in no central object<br>Only in central continuous ON<br>Only in central continuous OFF<br>Only in central switching and continuous ON<br>Only in central switching and continuous OFF<br>Only in continuous OFF and continuous ON | Defines which central objects the channel responds to. The central objects have the following priority:<br>If continuous ON is set to “1” then the channel is switched on regardless of the other objects.<br>If continuous ON is set to "0" and continuous OFF is set to "1" then the channel is switched off regardless of the other objects.<br>Central switching does not take priority over the switching object – the last command to be sent applies.<br>The manual switches on the device take priority over all bus commands. |
| Participation in scenes | **Yes: in the scenes 1-8**<br>No<br>Yes: in the scenes 1-4<br>Yes: in the scenes 5-8<br>Yes: in the scenes 3-6<br>Yes: in the scenes 1-2<br>Yes: in the scenes 3-4<br>Yes: in the scenes 5-6<br>Yes: in the scenes 7-8<br>Yes: in the scenes 1,2,5,6<br>Yes: in the scenes 1,2,7,8<br>Yes: in the scenes 1-6<br>Yes: in the scenes 3-8 | Defines which scenes the channel is integrated in.<br>If a scene in which the channel is participating is learned via the scene object ($80 = scene 1, $81 = scene 2 etc.), then the current status of the channel is saved. In the process it is irrelevant whether the status was brought about via the rotary switch or via bus messages.<br>If a scene in which the channel is participating is recalled via the scene object (0 = scene 1, 1 = scene 2 etc.) , then the channel reverts to the saved status.<br>This status can be changed again at any time by sending to the switching object or by sending to the central switching object. |
| Sending feedback | **On change only**<br>Cyclically and in the event of change | Defines whether the status of the channel is only sent after a change in the switching status, or whether it is also sent at regular intervals within the cycle time specified on the “General” page. After restoration of the mains supply every status is resent; after restoration of the bus supply every changed status is resent. |
| Behaviour in the event of bus failure | **Unchanged**<br>ON<br>OFF | If the bus voltage has failed for more than 6 seconds then the channel adopts the status defined here. The same applies to a complete or partial download of the application. |
| Behaviour after restoration of the mains supply or bus supply | **Same as before failure**<br>ON<br>OFF | After restoration of the mains supply or restoration of the bus supply with the mains voltage present, the channels revert to the status defined here within a time frame of 1 second.<br>When mains power is restored, the relays on the RMG4 S are briefly activated (approx. 50 ms) before the configured status is adopted. |


Function: Switching ON/OFF
theben
Relay
Bus
0
1
Kind of contact
N.O.
N.C.
Inverter
ON
OFF
Logic function
none
disable
AND
AND with feedback*
OR
Recall scene
Save scene
Scene 0
Scene 1
Scene 2
Scene 3
Scene 4
Scene 5
Scene 6
Scene 7
Scene, only when logic function = "none"
last sent object is selected
Participation
Bit 7
Bit 0...2
Scene 0...7
Switching
Central switching
Logic 1
Logic 2
Logic 3
Permanent OFF
Permanent ON
* Only true if Logic 1 was set before

### 3.3.3 The function "On/off time delay"

Basic functionality:
If the channel is switched off and a "1" is sent to the switching object then the switch-on delay time starts. The switch-on takes place once the switch-on delay time has elapsed.
If the channel is switched on and a "0" is sent to the switching object then the switch-off delay time starts. The switch-off takes place once the switch-off delay has elapsed.
If while a delay time is running the inverse status is sent then the delay time stops. There is then no switchover.
If while a delay time is running the same status is sent again then this has no effect on the current delay time.

If the function "On/off time delay" is selected then the following parameters are available:

**Table 6**

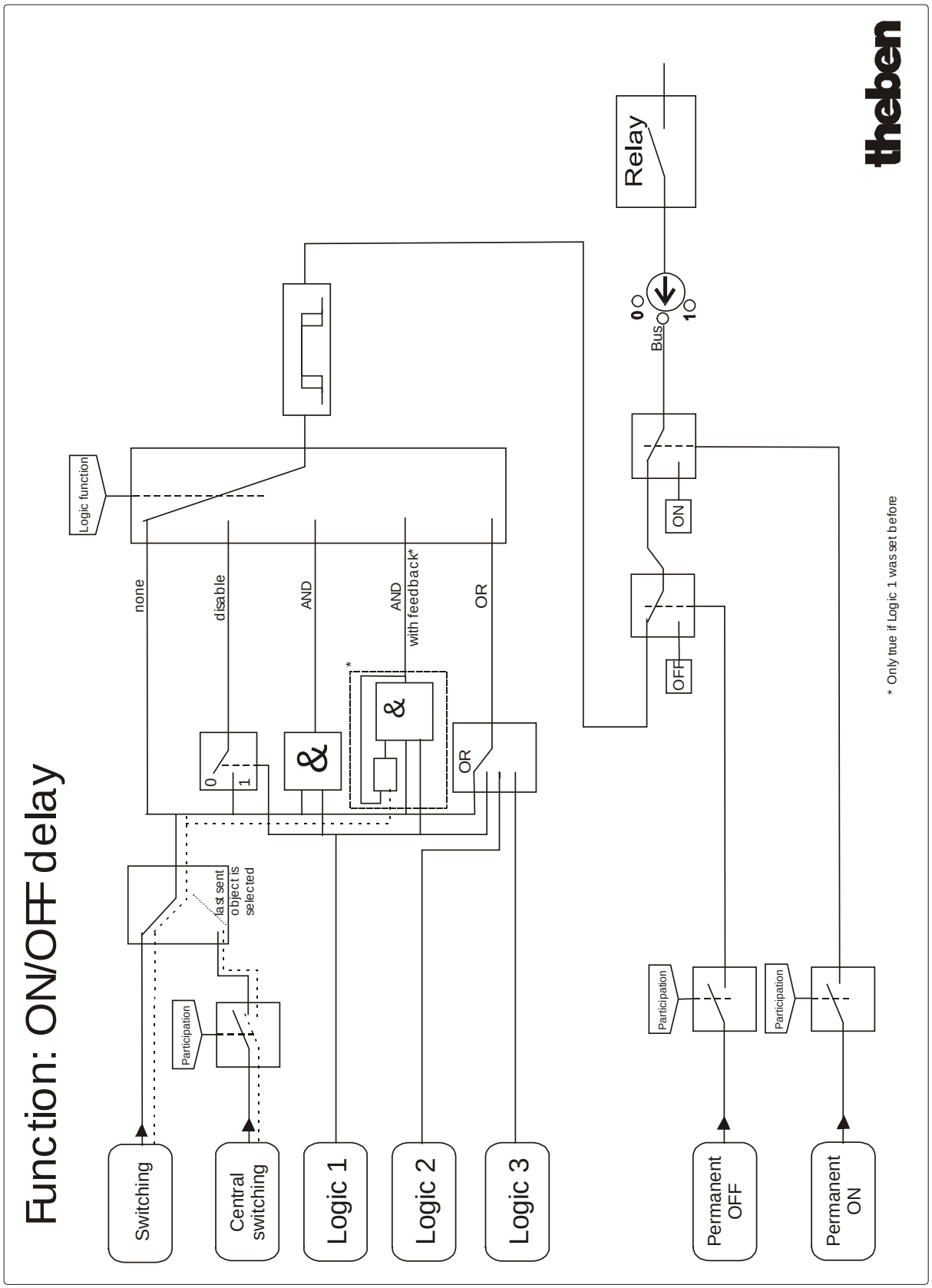
| Designation | Values | Meaning |
|---|---|---|
| Basis for on or off time delay | 1s<br>10 s<br>30 s<br>**1 min.** | Defines the switch-on time delay and the switch-off time delay in conjunction with the "switch-on time delay factor" and the "switch off time delay factor". |
| Switch-on time delay factor | 0-255 | Defines the switch-on time delay in conjunction with the "basis for on and off time delay".<br>Switch-on time delay = basis * factor<br>The factor 0 means that the switching operation is performed without delay. The maximum error on the timer is 5% of the basis.<br>Example: Basis = 10 s, any factor<br>Error: max. 0.5 sec |
| Switch-off time delay factor | 0-255 | Defines the switch-off time delay in conjunction with the "basis for on and off time delay".<br>Switch-off time delay = basis * factor<br>The factor 0 means that the switching operation is performed without delay. The maximum error on the timer is 5% of the basis.<br>Example: Basis = 10 s, any factor<br>Error: max. 0.5 sec |

Continued

| Designation | Values | Meaning |
|---|---|---|
| Link | **None**<br>Disable<br>OR<br>AND<br>Enable | None: The channel has the function described at the beginning.<br>Disable: If the linking object is set to "1" then no switch-on is possible via the switching object. If the channel is switched on then it will switch off again after the switch-off delay time.<br>If the linking object is set to "0" then the channel has the function described at the beginning.<br>OR: If the switching object or at least one of the 3 linking objects is set to "1" then a switch-on is performed after the switch-on delay time. If all objects are set to "0" then a switch-off is performed after the switch-off delay time.<br>AND: If the linking object is set to "0" then no switch-on is possible via the switching object. If the channel is switched on then it will switch off again after the switch-off delay time.<br>If the linking object is set to "1" then the channel has the function described at the beginning.<br>Enable: If the linking object is set to "1" and **afterwards** the switching object is set to "1" then the channel switches ON after the switch-on delay time. If at least one of the objects is set to "0" or the switching object is set to "1" first (before the linking object) then the channel switches off after the switch-off time delay. |
| Participation in central objects | **Yes, in all central objects**<br>No, in no central object<br>Only in central continuous ON<br>Only in central continuous OFF<br>Only in central switching and continuous ON<br>Only in central switching and continuous OFF<br>Only in continuous OFF and continuous ON | Defines which central objects the channel responds to. The central objects have the following priority:<br>If continuous ON is set to “1” then the channel is switched on without a delay, regardless of the other objects.<br>If continuous ON is set to "0" and continuous OFF is set to "1" then the channel is switched off without a delay, regardless of the other objects.<br>Central switching does not take priority over the switching object – the last command to be sent applies.<br>The manual switches on the device take priority over all bus commands. |
| Sending feedback | **On change only**<br>Cyclically and in the event of change | Defines whether the status of the channel is only sent after a change in the switching status, or whether it is also sent at regular intervals within the cycle time specified on the “General” page.<br>After restoration of the mains supply every status is resent; after restoration of the bus supply every changed status is resent. |

Continued

| Designation | Values | Meaning |
|---|---|---|
| Behaviour in the event of bus failure | **Unchanged**<br>ON<br>OFF | If the bus voltage has failed for more than 6 seconds then the channel adopts the status defined here. The same applies to a complete or partial download of the application. If the value is "unchanged" then the channel status is retained and the timers are deleted. |
| Behaviour after restoration of the mains supply or bus supply | **Same as before failure**<br>ON<br>OFF | After restoration of the mains supply or restoration of the bus supply with the mains voltage present, the channels revert to the status defined here within a time frame of 1 second.<br>When mains power is restored, the relays on the RMG4 S are briefly activated (approx.<br>50 ms) before the configured status is adopted. |


Function: ON/OFF delay
theben
Relay
0
Bus
1
Logic function
none
disable
AND
AND
with feedback*
OR
ON
OFF
&
&
OR
0
1
last sent object is selected
Participation
Participation
Participation
* Only true if Logic 1 was set before
Switching
Central switching
Logic 1
Logic 2
Logic 3
Permanent OFF
Permanent ON

### 3.3.4 The "Pulse function"

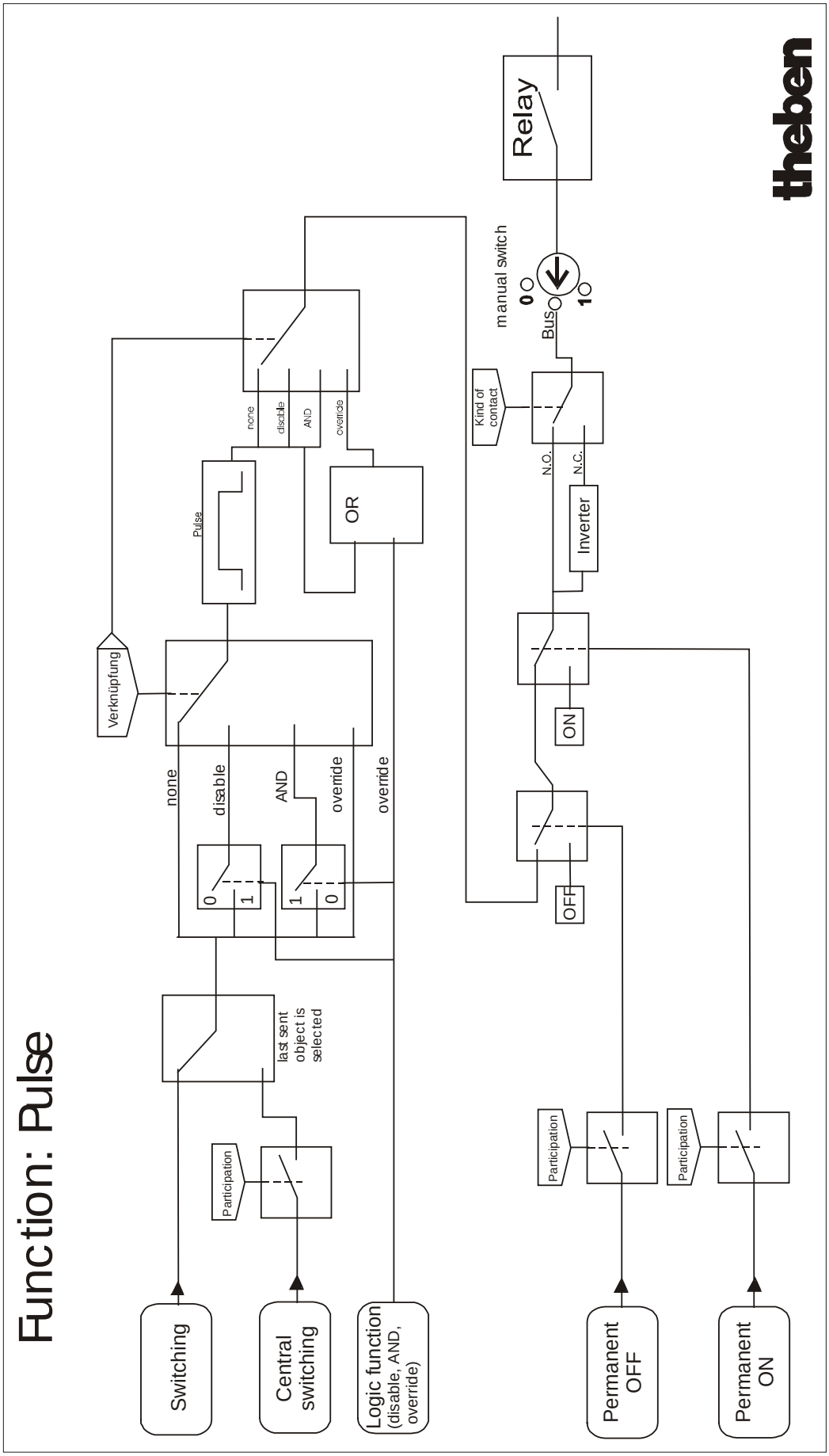
Basic functionality:
A "1" on the switching object switches the channel on for the duration of a pulse length.
If a "1" is sent again during this switch-on phase then the channel remains switched on for the duration of a further pulse length.
If a "0" is sent during this switch-on phase then the channel switches off immediately.
If the function "Pulse function" is selected then the following parameters are available:

**Table 7**

| Designation | Values | Meaning |
|---|---|---|
| Type of contact | **NO contact**<br>NC contact | NO contact: the contact is closed when a switch-on command is present.<br>NC contact: the contact is opened when a switch-on command is present.<br>This parameter only applies to the operation of the bus – the function of the manual switch is not affected by it. |
| Basis for pulse length | 1s<br>10 s<br>30 s<br>**1 min.** | Defines the pulse length together with the “pulse length factor”. |
| Pulse length factor | 1-255 | Defines the pulse length together with the “basis for pulse length”.<br>Pulse length = basis * factor<br><br>The maximum error on the timer is 5% of the basis. Example: Basis = 10 s, any factor<br>Error: max. 0.5 sec. |
| Link | **None**<br>Disable<br>AND<br>Override | None: The channel only reacts to the switching object in the way described at the beginning.<br>Disable: If the linking object is set to "1" then no pulse can be started. The linking object has no meaning for pulses which are already running.<br>AND: If the linking object is set to "0" then no pulse can be started. The linking object has no meaning for pulses which are already running.<br>Override: If the linking object is set to "1" then the channel is switched on regardless of the switching object.<br>Any waiting pulses are deleted during an override. |

Continued

| Designation | Values | Meaning |
|---|---|---|
| Participation in central objects | **Yes, in all central objects**<br>No, in no central object<br>Only in central continuous ON<br>Only in central continuous OFF<br>Only in central switching and continuous ON<br>Only in central switching and continuous OFF<br>Only in continuous OFF and continuous ON | Defines which central objects the channel responds to. The central objects have the following priority:<br>If continuous ON is set to “1” then the channel is switched on regardless of the other objects.<br>If continuous ON is set to "0" and continuous OFF is set to "1" then the channel is switched off regardless of the other objects.<br>Pulses are not deleted by the continuous objects, instead they continue to run in the background.<br>Central switching does not take priority over the switching object – the last command to be sent applies.<br>The manual switches on the device take priority over all bus commands. |
| Sending feedback | **On change only**<br>Cyclically and in the event of change | Defines whether the status of the channel is only sent after a change in the switching status, or whether it is also sent at regular intervals within the cycle time specified on the “General” page.<br>After restoration of the mains supply every status is resent; after restoration of the bus supply every changed status is resent. |
| Behaviour in the event of bus failure | **Unchanged**<br>ON<br>OFF | If the bus voltage has failed for more than 6 seconds then the channel adopts the status defined here. The same applies to a complete or partial download of the application. If the value is "unchanged" then any pulses which are still running are still executed. |
| Behaviour after restoration of the mains supply or bus supply | **Start pulse**<br>OFF | After restoration of the mains supply or restoration of the bus supply with the mains voltage present, the channels revert to the status defined here within a time frame of 1 second.<br>When mains power is restored, the relays on the RMG4 S are briefly activated (approx.<br>50 ms) before the configured status is adopted. |


Function: Pulse
theben
Relay
manual switch
0
1
Bus
Kind of contact
N.O.
N.C.
Inverter
ON
OFF
none
disable
AND
override
OR
Pulse
Verknüpfung
last sent object is selected
Participation
Switching
Central switching
Logic function (disable, AND, override)
Permanent OFF
Permanent ON

### 3.3.5 The function "Staircase light timer with pre-warning function"

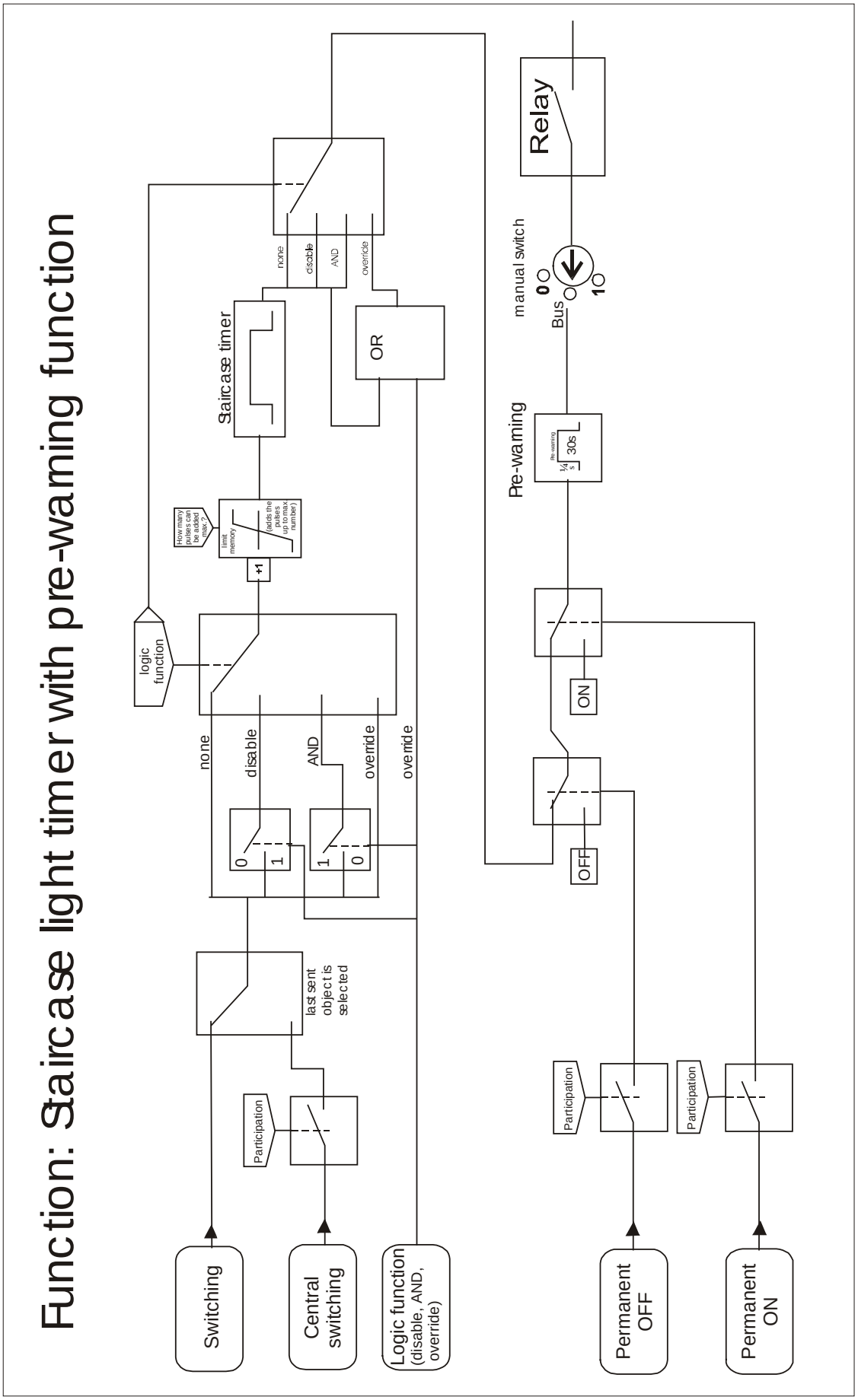
Basic functionality:
A "1" on the switching object switches the channel on for the duration of the staircase light time.
If another "1" is sent during this switch-on time then a further staircase light time is added to the staircase light time which is already running. If a "0" is sent during this switch-on phase then the channel switches off after a 30-second pre-warning.
The light flickers briefly at the start of the pre-warning period.
If the function "Staircase light timer with pre-warning function" is selected then the following parameters are available:

**Table 8**

| Designation | Values | Meaning |
|---|---|---|
| Basis for staircase light time | 1s<br>10 s<br>30 s<br>**1 min.** | Defines the staircase light time together with the "staircase light time factor". |
| Staircase light time factor | 1-255 | Defines the staircase light time together with the "basis for staircase light time".<br>Staircase light time = basis * factor<br><br>The maximum error on the timer is 5% of the basis. Example: Basis = 10 s, any factor<br>Error: max. 0.5 sec |
| How many pulses max add (1..40) | 1-40 | Defines how many times the timer can be retriggered. |
| Link | **None**<br>Disable<br>AND<br>Override | None: The channel only reacts to the switching object in the way described at the beginning.<br>Disable: If the linking object is set to "1" then no staircase lighting can be started. The linking object has no meaning for staircase lighting times which are already running.<br>AND: If the linking object is set to "0" then no staircase lighting can be started. The linking object has no meaning for staircase lighting times which are already running.<br>Override: If the linking object is set to "1" then the channel is switched on regardless of the switching object.<br>Any waiting staircase lighting times are deleted during an override. |

Continued

| Designation | Values | Meaning |
|---|---|---|
| Participation in central objects | **Yes, in all central objects**<br>No, in no central object<br>Only in central continuous ON<br>Only in central continuous OFF<br>Only in central switching and continuous ON<br>Only in central switching and continuous OFF<br>Only in continuous OFF and continuous ON | Defines which central objects the channel responds to. The central objects have the following priority:<br>If continuous ON is set to “1” then the channel is switched on regardless of the other objects.<br>If continuous ON is set to "0" and continuous OFF is set to "1" then the channel is switched off regardless of the other objects.<br>There is a switch-off pre-warning if there is a switch-off due to the continuous objects.<br>Staircase light times are not deleted by the continuous objects, instead they continue to run in the background.<br>Central switching does not take priority over the switching object – the last command to be sent applies.<br>The manual switches on the device take priority over all bus commands. |
| Sending feedback | **On change only**<br>Cyclically and in the event of change | Defines whether the status of the channel is only sent after a change in the switching status, or whether it is also sent at regular intervals within the cycle time specified on the “General” page.<br>After restoration of the mains supply every status is resent; after restoration of the bus supply every changed status is resent. |
| Behaviour in the event of bus failure | **Unchanged**<br>ON<br>OFF | If the bus voltage has failed for more than 6 seconds then the channel adopts the status defined here. The same applies to a complete or partial download of the application. If the value is "unchanged" then any pulses which are still running are still executed. |
| Behaviour after restoration of the mains supply or bus supply | **Start pulse**<br>OFF | After restoration of the mains supply or restoration of the bus supply with the mains voltage present, the channels revert to the status defined here within a time frame of 1 second.<br>When mains power is restored, the relays on the RMG4 S are briefly activated (approx.<br>50 ms) before the configured status is adopted. |


Function: Staircase light timer with pre-warning function
Switching
Central switching
Logic function (disable, AND, override)
Permanent OFF
Permanent ON
Participation
Participation
last sent object is selected
logic function
none
disable
AND
override
override
How many pulses can be added max.?
limit memory
adds the pulses up to max. number
+1
Staircase timer
none
disable
AND
override
OR
Relay
manual switch
0
1
Bus
Pre-warning
Pre-warning
1/4 s
30s
ON
OFF

# 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 9**

| No. | *Function* | *Object name* | Type | Response |
|---|---|---|---|---|
| 80 | *Switching ON/OFF* | *EM1 RME 4 S / C-load channel C1* | EIS 1 | Receive |
| 81 | *Depending on the function and the linking of the channel*<br>• *Lock*<br>• *Input in AND gate*<br>• *Input 5.08 cm OR gate*<br>• *Override* | *EM1 RME 4 S / C-load channel C1* | EIS 1 | Receive |
| 82 | *With OR link selected: Input 7.62 cm OR gate* | *EM1 RME 4 S / C-load channel C1* | EIS 1 | Receive |
| 83 | *With OR link selected: Input 4 in OR gate* | *EM1 RME 4 S / C-load channel C1* | EIS 1 | Receive |
| 84 | *Feedback* | *EM1 RME 4 S / C-load channel C1* | EIS 1 | Send |
| 85-179 | …. For all additional channels incl. second RME 4 S / C-load module | | | |
| 240 | *Switching ON/OFF* | *Central continuous ON* | EIS 1 | Receive |
| 241 | *Switching ON/OFF* | *Central continuous OFF* | EIS 1 | Receive |
| 242 | *Switching ON/OFF* | *Central switching* | EIS 1 | Receive |
| 243 | *Call/save scene* | *Scene* | EIS 1 | Receive |

## 4.2 Description of objects

- **Object 80, 85, 90, 95, 160, 165, 170, 175** *"Switching RMG4 channel 1"*

This object is the actual input object for channel 1.
It acts on the function selected in the parameter page of the channel.

- **Object 81, 86, 91, 96, 161, 166, 171, 176** *"Input 2 in OR gate / input in AND gate / lock"*

This object is an input object for the linking of channel 1 and acts on the selected link.

- **Object 82, 87, 92, 97, 162, 167, 172, 177** *"Input 3 in OR gate"*

This object is an input object for the linking of channel 1. It only appears if an OR link is selected.

- **Object 83, 88, 93, 98, 163, 168, 173, 178** *"Input 10.16 cm OR gate"*

This object is an input object for the linking of channel 1. It only appears if an OR link is selected.

- **Object 84 , 89, 94, 99, 164, 169, 174, 179** *"Feedback RMG4"*

This object is the output object for channel 1. This object reports the switching status of the channel.

- **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" then all of the channels "participating" in this object are switched on.
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" then all of the channels "participating" in this object are switched off.
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 "80" is sent to the switching objects of the channels (Object 0, Object 85, 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 status of the channel, regardless of how the status was brought about (e.g. via switching commands, central objects or the manual switches). The saved status is re-established when it is called.
Each channel can participate in a maximum of 8 scenes.

## 4.3 Parameter overview

**Table 10**

| Function | Description |
|---|---|
| ***RME 4 channel C1: Function selection*** | Set basic functions of channel. |
| ***Contact characteristics*** | Set type of contact. |
| ***On/off time delay*** | Set delays. |
| ***Pulse function*** | Set pulse length. |
| ***Staircase light time switch with pre-warning function*** | Set delay. |

### 4.3.1 The *"RME 4 channel C1: Function selection"* parameter page

**Table 11**

| Designation | Values | Application |
|---|---|---|
| *Channel function* | *Switching On/Off*<br>*On/off time delay*<br>*Pulse function*<br>*Staircase light time switch with pre-warning function* | Basic function of channel.<br>Determines the basic function and brings up the relevant parameter page. |
| *Link* | *None* | Channel status conforms with switching object. |
| | *Lock* | If the linking object is set to 0 then the contact is in the position according to the switching object. If the linking object is set to "1" then the channel is OFF. |
| | *OR* | If the switching object or at least one of the 3 linking objects is set to "1" then the contact is ON. If none of the 4 input objects are set then the channel is OFF. |
| | *AND* | If the switching object and the linking object are set to "1" then the channel is ON. |
| | *Override* | Only with staircase light timer:<br>1 = Switch light on permanently without considering time function. |
| | *Enable* | If the linking object is set to "1" and **afterwards** the switching object is set to "1" then the channel switches ON. If one of the objects is set to "0" or the switching object is set to "1" first (before the linking object) then the channel is OFF. |

Continuation:

| Designation | Values | Application |
|---|---|---|
| *Participation in central objects* | ***Yes, in all central objects***<br>*No, in no central object*<br>*Only in central continuous ON*<br>*Only in central continuous OFF*<br>*Only in central switching and continuous ON*<br>*Only in central switching and continuous OFF*<br>*Only in permanent OFF and permanent ON* | Defines which central objects the channel responds to. The central objects have the following priority:<br>If continuous ON is set to “1” then the channel is switched on regardless of the other objects.<br>If permanent ON is set to "0" and permanent OFF is set to "1" then the channel is switched off regardless of the other objects.<br>Central switching does not take priority over the switching object – the last command to be sent applies.<br>The manual switches on the device take priority over all bus commands. |
| *Send feedback cyclically* | *No*<br>*Yes* | Should the feedback object send cyclically?<br><br>The cycle time is set on the first parameter page (→*General)*:<br>*Time for cyclical sending of feedback object (MIX series, order no.491...)* |

## 4.3.2 The *"Contact characteristics"* parameter page

This page is only available with *Switching ON/OFF* and *pulse function*.

**Table 12**

| Designation | Values | Application |
|---|---|---|
| *Type of contact* | ***NO contact***<br>*NC contact* | NO contact: the contact is closed when a switch-on command is present.<br>NC contact: the contact is opened when a switch-on command is present.<br>This parameter only applies to the operation of the bus – the function of the manual switch is not affected by it. |

### 4.3.3 The *"On/Off delay"* parameter page

**Table 13**

| Designation | Values | Application |
|---|---|---|
| *Basis for on or off time delay* | *1s*<br>*10 s*<br>*30 s*<br>***1 min*** | Defines the switch-on delay and the switch-off delay in conjunction with the "switch-on delay factor" and the "switch-off delay factor". |
| *Switch-on time delay factor* | *0-255* | Switch-on time delay = basis * factor<br>Factor 0 means that the switching operation is performed without delay.<br>The maximum error on the time switch is 5% of the basis.<br>Example: Basis = 10 s, any factor<br>Error: max. 0.5 sec |
| *Switch-off delay factor* | *0-255* | Switch-off delay = basis * factor<br>Factor 0 means that the switching operation is performed without delay.<br>The maximum error on the time switch is 5% of the basis.<br>Example: Basis = 10 s, any factor<br>Error: max. 0.5 sec |

### 4.3.4 The *"Pulse function"* parameter page

**Table 14**

| Designation | Values | Application |
|---|---|---|
| *Basis for pulse length* | *1s*<br>*10 s*<br>*30 s*<br>***1 min*** | Defines the pulse length together with the “pulse length factor”. |
| *Factor for pulse length 1..255 x base* | *1-255* | Pulse length = basis * factor<br><br>The maximum error on the timer is 5% of the basis. Example: Basis = 10 s, any factor<br>Error: max. 0.5 sec. |

### 4.3.5 The staircase time switch with pre-warning

**Table 15**

| Designation | Values | Application |
|---|---|---|
| *Basis for staircase light time* | *1s*<br>*10 s*<br>*30 s*<br>***1 min*** | Defines the staircase light time together with the "staircase light time factor". |
| *Pulse length factor* | *1-255* | Staircase light time = basis * factor<br><br>The maximum error on the timer is 5% of the basis. Example: Basis = 10 s, any factor<br>Error: max. 0.5 sec |
| *Maximum number of pulses counted up 1..40* | *1-40* | determines how long the staircase light time can be extended by pressing the push button again. |

### 4.3.6 The power loss and restoration parameter page

The parameters depend on the selected channel function.

**Table 16**

| Designation | Values | Description |
|---|---|---|
| *Channel function: Switching On/Off..* | | |
| *Response in the event of bus failure* | ***Unchanged***<br>*ON*<br>*OFF* | If the bus voltage has failed for more than 6 seconds then the channel adopts the status defined here. The same applies to a complete or partial download of the application. |
| *Behaviour after restoration of the mains supply or bus supply* | ***Same as before failure***<br>*ON*<br>*OFF* | After restoration of the mains supply or restoration of the bus supply with the mains voltage present, the channels revert to the status defined here within a time frame of 1 second. |
| *Channel function: Switching On/Off delay..* | | |
| *Response in the event of bus failure* | ***Unchanged***<br>*ON*<br>*OFF* | If the bus voltage has failed for more than 6 seconds then the channel adopts the status defined here. The same applies to a complete or partial download of the application. If the value is "unchanged" then the channel status is retained and the timers are deleted. |
| *Behaviour after restoration of the mains supply or bus supply* | ***Same as before failure***<br>*ON*<br>*OFF* | After restoration of the mains supply or restoration of the bus supply with the mains voltage present, the channels revert to the status defined here within a time frame of 1 second. |
| *Channel function: Pulse function..* | | |
| *Response in the event of bus failure* | ***Unchanged***<br>*ON*<br>*OFF* | If the bus voltage has failed for more than 6 seconds then the channel adopts the status defined here. The same applies to a complete or partial download of the application. If the value is "unchanged" then any pulses which are still running are still executed. |
| *Behaviour after restoration of the mains supply or bus supply* | ***Start pulse***<br>*OFF* | After restoration of the mains supply or restoration of the bus supply with the mains voltage present, the channels revert to the status defined here within a time frame of 1 second. |

Continuation:

| Designation | Values | Description |
|---|---|---|
| *Channel function: Staircase light time switch with pre-warning function..* | | |
| *Response in the event of bus failure* | ***Unchanged***<br>*ON*<br>*OFF* | If the bus voltage has failed for more than 6 seconds then the channel adopts the status defined here. The same applies to a complete or partial download of the application. If the value is "unchanged" then any pulses which are still running are still executed. |
| *Behaviour after restoration of the mains supply or bus supply* | ***Start pulse***<br>*OFF* | After restoration of the mains supply or restoration of the bus supply with the mains voltage present, the channels revert to the status defined here within a time frame of 1 second. |

# 5 Appendix

## *5.1 The scenes*

### 5.1.1 Principle

The scene function allows the current switching condition or dimming value for one or more channels to be saved.
All possible lighting situations can thus be easily and comfortably restored at any time by calling a scene.

- Up to 8 different scenes can be defined.
- Participation in one or more scenes can be individually selected for each channel.
- The scenes are permanently stored and remain intact even after the application has been downloaded again.

### 5.1.2 Saving scenes (teach in)

To teach in a scene, the associated scene code is sent to the scene object.

**Saving codes for scenes**

| Scene number | Saving code | |
|---|---|---|
| | Hex. | Dec. |
| 1 | $80 | 128 |
| 2 | $81 | 129 |
| 3 | $82 | 130 |
| 4 | $83 | 131 |
| 5 | $84 | 132 |
| 6 | $85 | 133 |
| 7 | $86 | 134 |
| 8 | $87 | 135 |

If a scene in which the channel is participating is taught in via the scene object, the current condition of the channel is saved. It does not matter whether the condition was established via the rotary switch or by bus telegram.

### 5.1.3 Calling scenes

Just as with teaching in, scenes are called by sending a code to the scene object.

**Calling codes for scenes:**

| Scene number | Calling code Hex. / Dec. |
|---|---|
| 1 | 0 |
| 2 | 1 |
| 3 | 2 |
| 4 | 3 |
| 5 | 4 |
| 6 | 5 |
| 7 | 6 |
| 8 | 7 |

If a scene in which the channel is participating is called via the scene object, the channel assumes the saved condition.

This status can be changed again at any time by sending to the switching object or by sending to the central switching object.

Channels **not** participating in scenes are not affected by this.