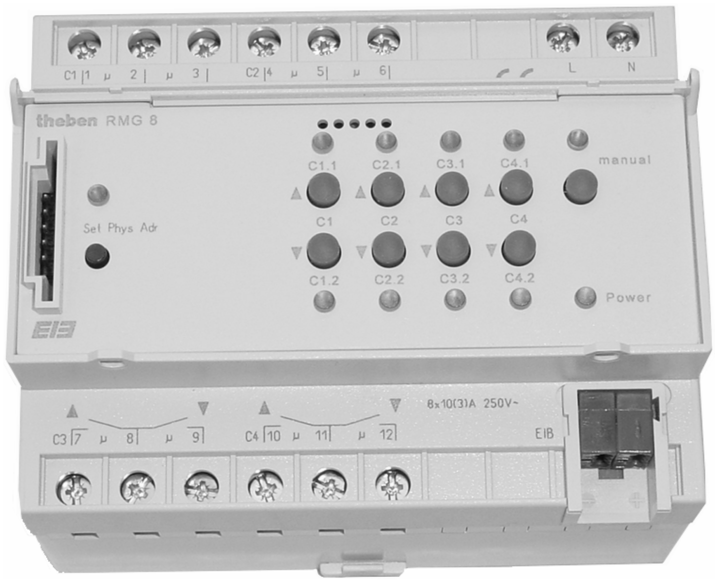
RMG 8 Switch Actuator

RME 8 / RMX 4 Switch Actuator Modules

JMG 4 Blinds Actuator

(for JMG 4 refer to Chapter 1.3)



JMG 4	490 0 250
RMG 8	490 0 251
RME 8	490 0 252
RMX 4	490 0 256
Key for JMG 4 / RMG 8	907 0 304

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1 Function Properties

The RMG 8 EIB blinds and switch actuator and the RME 8 / RMX 4 extension modules can be used as a

- **Drive controller** for blinds, roller shutters and sunshades, and as a
- **Switch actuator**, e.g. for lighting, ventilation and the like.

If used as a lighting controller, the individual channels of the RMG 8 and RME 8 / RMX 4 devices can be parameterised:

- As a **switch actuator** (on/off without delay)
- As a **delay mechanism for on/off operations** (delay times can be individually set)
- As a **pulsing function** (activation restricted by timeout)
- **As an automatic time switch for staircase lighting with cut out early warning** (after the preset time has elapsed, the light is switched off temporarily (for 0.25 s) and then switched on again for 30s).

Several inhibit and control objects enable a remote control of the connected devices, e.g. central raising or lowering of blinds/roller shutters/shading devices or central inhibiting of individual or all switching channels.

Via three safety objects, sunshades or sight protection devices can be retracted/extended to a defined position, for example in the case of a storm or rain.

The application software distinguishes between standard and expert users (refer to the chapter Expert Application).

1.1 Advantages

- Modular device concept with as many as 8 driving or 16 switching channels.
- On-site device operation, e.g. an installation test of the drive mechanisms / lighting for example is also possible without bus voltage.
- LED status indicators of the outputs: Switching status, keyboard lock, higher priority
- Every driving channel can be parameterised to act as two switching channels (except for JMG 4).
- Every switching channel can be programmed to act as a convenient timer.
- The staircase lighting period can be extended by repeated actuation of the switch.
  (when a person has to clean the staircase, etc.). Cut out early warning function in compliance with DIN 18015-2.
- Simple input of the execution times in the ETS.
- Large scope of functions due to 47 objects.
- Even with traditional drive mechanisms any desired position can be approached due to the slippage compensation.
- Forced object (all drives up or down with highest priority) e.g. for cleaning windows or in the case of fire alarms.
- Flexible reaction to security telegrams: Can be set for each drive mechanism individually for the beginning and end of the safety status.
- The behaviour in the case of a bus failure and in the case of a recovery of the bus/mains voltage can be selected.
- Feedback of the position of the drive mechanism and the switching channel status for building visualization.

1.2 Areas of Application

The RMG 8 EIB switch actuator and the RME 8 / RMX 4 switch actuators module are suited for the following applications (examples):

- Control of awnings, blinds, roller shutters as well as various sunshades and sight protection devices
- Control of dormer windows and ventilation flaps
- Shading, lighting and heating greenhouses and winter gardens
- Lighting buildings and staircases
- Delayed activation/deactivation of groups of lights
- Short or long pulses for end-of-break gongs, toilet flushing installations or ventilation systems

1.3 Differences between RMG 8 and JMG 4

As opposed to RMG 8, JMG 4 is a pure drive controller and not a switch actuator.

The drive functions of the JMG 4 are completely identical to those of the RMG 8 but the switching capacity of 8 A of the JMG 4 is lower (refer to the chapter Technical Data).

The two devices can be expanded with an RME 8 or RMX 4 module.

The extension modules can always be parameterised as desired as a drive controller or as a switch actuator for light etc.

2 Technical Data

2.1 General

Voltage supply:	Via bus voltage and a separate A.C. power supply
Connections:	1 bus connection (RMG 8 and JMG 4 only) 1 power connection 4 channels (2 for the RMX 4) consisting of 2 relays each (n.o. contact)
Protection rating:	IP 20 in compliance with DIN EN 60 529
Protection class:	II following proper installation
Permissible ambient temperature:	– 5 °C to + 45 °C (-5T45)
Housing dimensions:	45 x 105 x 60 mm 45x53,5x60mm (RMX 4) v(H/W/D)
Weight:	approx. 450 g

2.2 Connection Data

	JMG 4	RMG 8	RME 8 / RMX 4
Operating voltage	230 V / 240 V ± 10 %		
Rated frequency	50 Hz		
Own consumption	max. 4 VA		
EIB current consumption	ˆ 8 mA		-
Contact-making material	AgSnO		
Contact type	Potential-free make-contact element		
Switching capacity (250 V~): cos φ = 1 cos φ = 0.6	 8 A 5 A	 10 A 6 A	
Power consumption of the incandescent lamp		1400 W	
Power consumption of the halogen lamp		1400 W	
Conv. tubular fluorescent lamps: uncompensated / compensated in series		19 x 40 W, 13 x 58 W, 8 x 100 W	
compensated in parallel		5 x 40 W (4.7 µF), 3 x 58 W (7.0 µF) 1 x 100 W (18 µF)	
dual switch		6 x (2 x 58 W), 4 x (2 x 100 W)	
Fluorescent flashlights with ECG		4 x 58 W	
Tubular fluorescent lamps with ECG – dual switch	-	2 x (2 x 58 W)	
Mercury discharge lamps: uncompensated compensated in parallel		Use a contactor	
Sodium discharge lamps: uncompensated compensated in parallel		Use a contactor	
Compact fluorescent lamps with ECG		32 x 5 W, 30 x 7 W, 13 x 8 W, 13 x 11 W, 17 x 15 W, 10 x 20 W, 10 x 23 W	
Compact fluorescent lamps with conventional control gear		1200 W	

2.3 Connection Diagram

Connecting the EIB Installation Bus

3 The "8x Switching / 4x Drive + Expansion" Application Program

See chapter 1.3: Differences between RMG 8 and JMG 4

3.1 Function Properties

The application program provides the functions listed below.

Function	Description
General	Basic device settings: Device type, keyboard lock, manual mode
Drives general	Monitoring of the security objects, neutral position of the slats
Function of the channels	This function is used to define which channels are to be parameterised as drive controller and which are to be parameterised as switching channels
Drive 1 to 4 (to 8)	Is displayed when the respective channel is parameterised as a drive controller
Channel 1.1 / 1.2 ... 4.1 / 4.2 (... 8.1 / 8.2)	Is displayed when the respective channel is parameterised as a switching channel

IMPORTANT: After downloading the application or after the bus voltage has been restored, it may take up to 15 seconds until the device is ready again for operation.

3.2 Selecting in the Product Database

Manufacturer:	THEBEN-WERK ZEITAUTOMATIK
Product family	Output
Product type:	Drives and switches; modular
Product name:	RMG 8 / JMG 4 (see 1.3: Differences between RMG 8 and JMG 4)

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

3.3 Communication Objects

3.3.1 Introduction

The basic setting for each channel is the parameterization as a drive controller or as a switching channel with 2 outputs.

The function and thus the type and designation of the individual objects depend on the use of the corresponding channel, i.e. drive, roller shutter, blinds, switching channel, timer and the like.

In this case, we will use channel 1 as an example.

3.3.2 Overview

3.3.2.1 Channel Parameterised as a Drive Mechanism

When the channel is parameterised as a drive mechanism, you can select the type of element that is to be driven (see the table below).

Object no.	Property	Selected type of driven element	
		Roller shutter / textile sunshade	**Blinds**
0	**Name**	Drive 1 up/down	
	Function	up / down	
	Type	1 Bit	
	Reaction	receive	
1	**Name**	Drive 1 stop	Drive 1 step / stop
	Function	Stop roller blind	Step/stop shutter
	Type	1 Bit	
	Reaction	receive	
2	**Name**	Drive 1 height	
	Function	Height [%]	
	Type	1 Byte	
	Reaction	receive / (feedback height)	
3	**Name**	not available	Drive 1 slats
	Function		Position of the slats in %
	Type		1 Byte
	Reaction		receive / (feedback slats position)
4	**Name**	Drive 1 auto comfort	
	Function	Auto comfort	
	Type	1 Bit	
	Reaction	receive	

Channel Parameterised as a Switching Channel with 2 Outputs

If the channel is parameterised as a switching channel with 2 outputs, one of four timing functions can be selected for each channel (see the table below).

<table>
<tr><th rowspan="2">Object no.</th><th rowspan="2">Property</th><th colspan="4">Selected timing function</th></tr>
<tr><th>switch ON/OFF</th><th>staircase time switch with cut out early warning</th><th>impulse function</th><th>ON / OFF delay</th></tr>
<tr><td rowspan="4">0</td><td>Name</td><td>Channel 1.1 switch</td><td>Channel 1.1 staircase time switch</td><td>Channel 1.1 impulse</td><td>Channel 1.1 switch</td></tr>
<tr><td>Function</td><td>ON/OFF</td><td colspan="2">Start / stop</td><td>Delayed ON/OFF</td></tr>
<tr><td>Type</td><td colspan="4">1 Bit</td></tr>
<tr><td>Reaction</td><td colspan="4">receive</td></tr>
<tr><td rowspan="4">1</td><td>Name</td><td colspan="4">Channel 1.1 state</td></tr>
<tr><td>Function</td><td colspan="4">Feedback</td></tr>
<tr><td>Type</td><td colspan="4">1 Bit</td></tr>
<tr><td>Reaction</td><td colspan="4">send</td></tr>
<tr><td rowspan="4">2</td><td>Name</td><td>Channel 1.2 switch</td><td>Channel 1.2 staircase time switch</td><td>Channel 1.2 impulse</td><td>Channel 1.2 switch</td></tr>
<tr><td>Function</td><td>ON/OFF</td><td colspan="2">Start / stop</td><td>Delayed ON/OFF</td></tr>
<tr><td>Type</td><td colspan="4">1 Bit</td></tr>
<tr><td>Reaction</td><td colspan="4">receive</td></tr>
<tr><td rowspan="4">3</td><td>Name</td><td colspan="4">Channel 1.2 state</td></tr>
<tr><td>Function</td><td colspan="4">Feedback</td></tr>
<tr><td>Type</td><td colspan="4">1 Bit</td></tr>
<tr><td>Reaction</td><td colspan="4">send</td></tr>
<tr><td rowspan="4">4</td><td>Name</td><td colspan="4">Inhibit Channels 1.X</td></tr>
<tr><td>Function</td><td colspan="4">Inhibit Channels 1.1 and 1.2</td></tr>
<tr><td>Type</td><td colspan="4">1 Bit</td></tr>
<tr><td>Reaction</td><td colspan="4">receive</td></tr>
</table>

Number of communication objects	47
Number of group addresses:	85
Number of associations:	85

3.3.3 Description of the Objects

- **Object 0**

Name (refer to the overview)	**Function**
Drive 1 up/down	Raise roller shutter/blinds with "0" and lower them with "1"
Channel 1.1 switch	Switch on the relay with "1" and switch it off with "0"
Channel 1.1 staircase time switch	Activate automatic staircase time switch with "1" and deactivate it with "0". As soon as the parameterised time has elapsed or when a "0" is sent to the object, the relay switches off after a cutout early warning. cutout early warning: The relay switches off for ¼ of a second, switches on again for 30 seconds and then switches off completely.
Channel 1.1 impulse	Activate the impulse with "1" and deactivate it with "0". As soon as the parameterised pulse time has elapsed or when a "0" is sent to the object, the relay switches off.
Channel 1.1 delayed ON/OFF	If a "1" is sent to the object, the relay switches on after the parameterised period of delay. If a "0" is sent, the delay refers to the switch-off time. Special cases: A "0" sent during the switch-on delay period or a "1" sent during the switch-off delay period interrupts the procedure.

- **Object 1**

Name (refer to the overview)	**Function**
Drive 1 stop	A "1" or a "0" sent to the object stops the raising or lowering operation.
Drive 1 step/stop	If the blind is moving, it will be stopped. Otherwise, a short movement of the slats is performed (step mode). The direction of the "step" is defined by sending either a "0" or a "1" to the object. Steps will not be performed after the maximum possible slat turn position has been reached ("Full Slats turn" parameter).
Channel 1.1 state	Feedback of the current relay status, e.g. for building visualization. Example: A delayed switch-on operation is started, the feedback object is set when the relay is switched on following the elapsed delay period.

- **Object 2**

Name (refer to the overview)	**Function**
Drive 1 height	Raise/lower the roller shutter/blinds to a specific position. The position value is specified in %. 0% ... 3% = upper end of travel 100 % = lower end of travel Can be inhibited by the Auto comfort object (see below). If the target position is too near (i.e. within the turning time of the slats), the command is suppressed. If desired, this object can send the position of the driven element to the bus (refer to the chapter Professional Drive Application).
Channel 1.2 switch, staircase time switch, impulse	Same functions as object 0 for channel 1.1

- **Object 3**

Name (refer to the overview)	**Function**
Drive 1 slats	Presetting of a specific slat turn value in %. Can be inhibited by the Auto comfort object (see below).
Channel 1.2 state	Same function as object 1 for channel 1.1

- **Object 4**

Name (refer to the overview)	**Function**
Drive 1 auto comfort	Sending a "1" to this object inhibits the functions Drive 1 height and Drive 1 slats. This function is used to prevent the manipulation of the blind position by third-party interference and thus to maintain a preferred position of the slats. The up/down functions (objects 0 and 1) remain operational.
Inhibit channels 1.X	Sending a "1" to this object inhibits channel 1.1 and channel 1.2 (see table 1-5, Parameter „Dependence on object Inhibit channels 1.X“)

Annotation:
The reaction of the objects 5 to 39 is identical to that of the objects 0 to 4 and they represent either the drives 2 to 8 or the channels 2.1 to 8.2.

- **Objects 40, 41, 42**

Name (refer to the overview)	Function
Central priority 1, 2 and 3	**Security objects**: A security object enables an aimed reaction of the drives to a specific situation with a high priority (refer to the appendix Priority Order of the Drive Controller). Example: A safety object is connected to a wind sensor. A drive connected to a textile sunshade is parameterised to react to this security object. For as long as a "0" is being sent, the standard operating status is assumed. In the case of a storm, the wind sensor sends a "1" to the security object and the sunshade is immediately retracted to the parameterised safety position.

IMPORTANT: A security object may be controlled by one device only. Otherwise different commands may cancel each other.

Annotation: Reading the security objects i.e. with “read value” function of ETS software: If the security status was initiated by cyclical monitoring, the value of this object will remain 0

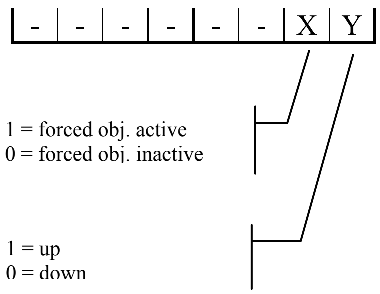
- **Object 43**

Name (refer to the overview)	Function
Drives central	Using this object, all the drive mechanisms parameterised accordingly can be controlled from one central point. With this function, all the roller shutters of a building front, for example, can be raised or lowered simultaneously by pressing one button. 0 = raise 1 = lower

- **Object 44**

Name (refer to the overview)	**Function**
Drives central priority	Forced up/down (2-bit object) The function corresponds to that of the Drives central object (see above) but this object has the **highest priority** and overrides all the other objects for as long as it is set. Areas of application: e.g. when cleaning the windows, in the case of fire fighting actions etc. Recommendation: If used, always send cyclically. Refer to the appendix Priority Order of the Drive Controller.

Data format:



- **Object 45**

Name (refer to the overview)	**Function**
Central permanent ON	For controlling switching outputs. Using this object, all the switching channels parameterised accordingly can be controlled from one central point. In this case, for example, all the lights on one floor with the highest priority can be switched on simultaneously by pressing one button (refer to the appendix Priority Order – Switching Output Controller).

- **Object 46**

Name (refer to the overview)	**Function**
Central permanent OFF	For controlling switching outputs. Using this object, all the switching channels parameterised accordingly can be controlled from one central point. In this case, for example, all the lights on one floor with the highest priority can be switched off simultaneously by pressing one button (refer to the appendix Priority Order – Switching Output Controller).

3.4 The Parameters

3.4.1 General

The "General" tab is used for setting the basic parameters.

The parameters that can be set are listed in the table below.

Table 1-1: Parameters on the "General" tab

Designation	Values	Description
Used device(s)	only RMG 8 RMG 8 and RME 8 RMG 8 and RMX 4	Select whether only the basic device (4 drives) or the basic device + an extension (a total of 8 or 6 drives) is/are available
Device keys are	always enabled only enabled if theben-key for JMG 4 / RMG 8 (item no. 907 0 304) is plugged	Key lock deactivated If the option "only enabled if key is plugged" is selected, the device keyboard is locked and manual operation is possible only if a key is inserted in the interface on the front of the device.
Manual mode	 automatically cleared after 30 min permanent !	Function of the "manual" button on the device. The time limit of 30 minutes prevents a permanent disturbance of the system if the "manual" button was pressed e.g. by unauthorized persons. If a time limit is not selected, the manual mode is exited only if the following events occur: • the button is pressed once more • the bus voltage is restored • the mains voltage is interrupted • the device is reprogrammed

3.4.2 Drives General

Table 1-2: Parameters on the "Drives general" tab

Designation	Values	Description
Security 1 – 3 (objects)	without cyclical monitoring with cyclical monitoring	The last telegram always determines the security status. If a security object has been assigned an important alarming function, a check is performed whether the alarm sensor sends data periodically. If the sender fails, the security status is taken up. Example (see below).
Cyclical monitoring of all 3 Objects 1 ... 255 [x 1min]	Input: 1 to 255	If the sensors connected to the security objects send cyclically, the cycle time, i.e. the time interval between 2 telegrams must be entered here. Recommendation: The monitoring time of the actuator must be twice as long as the cycle time of the device to be monitored. Example: If the air speed meter sends to the security object 1 every 5 minutes, set the monitoring time to 10 minutes.
Allocation of the 0% Position to the objects Slats [%]	0% corresponds to travel down position 0% corresponds to travel up position	Input of the reference position for calculating the slats turn.
User level for drives	Standard Expert	Only standard parameters for standard use. On the expert level, the blinds actuator can be precisely adjusted in relation to the drives. Thus, utmost positioning accuracy can be attained.
Standard parameters for the "expert" user level (Descriptions: refer to the chapter Expert Application).		
Wait time at changing direction	0,5 s	
Slippage compensation of the drives	0,6%	
Automatic execution of object value "slats [%]" after object "height [%]"	enabled	
Stretch-out time at lower end of travel (for secure closing)	2 s	

3.4.3 Function of the Channels

Table 1-3: Parameters on the "Function of the channels" tab

Designation	Values	Description
Function of channel 1, 2, 3, 4 ... 8	Drive 2 switching outputs	Each channel can either be parameterised as a drive controller or as a controller for 2 switching outputs.

IMPORTANT: When changing the function of channels from switching channel to drive (or vice versa), the device must be reset by interrupting the power supply (for at least 2 s).

3.4.4 Drive x (Channel as Drive Controller)

Table 1-4: Parameters on the "Drive 1, Drive 2 ... Drive 8" tab

Designation	Values	Description
Drive application	Shutter / awning Blind	The type of device that is to be driven.
Full running time "down" 50 ... 10.000 [x 0.1s]	Keyboard input 50 to 10,000	Enter the measured runtime in 10th of a second. 10 = 1 s, 100 = 10 s etc.
Full Slats turn* 20 ... 200 [x 20 ms]	Keyboard input 20 to 200	Enter the measured turning time of the slats in steps of 20 ms. 100 = 100 x 20 ms = 2 s
Step time for object "step/stop shutter* 3 ... 55 [x 20 ms]	Keyboard input 3 to 55	Desired pulse length for step/stop mode. 10 = 10 x 20 ms = 0.2 s
Position at security begin / end	no reaction upper end of travel / unchanged upper end of travel / lower end of travel lower end of travel / unchanged lower end of travel / upper end of travel	Reaction of the driven element when the "Security" status is enabled and disabled. In the case of the standard application "upper end of travel / unchanged" the drive moves the driven element to the upper end of travel as soon as the security status is enabled (e.g. due to a storm) and remains in this position when the security status is disabled.

Table 1-4: continued

Designation	Values	Description
Which security objects have to act (logical "OR" combination)	security 1 security 2 security 3 security 1 and 2 security 1 and 3 security 2 and 3 security 1, 2 and 3	Setting that defines to which security object the drive is to respond. If several are selected, such as 1 and 3, these are linked by a logical OR operation. Example: Security 1 and 3 are to cause a reaction. As soon as one of the two security objects is addressed, the status „Security“ is active and the drive moves the driven element to the parameterised security position.
Dependence on object "Drives central up/down"	no yes	Is this drive to react to the "Drives central up/down" object?
Behaviour after BUS voltage loss	upper end of travel lower end of travel unchanged	After a bus failure (with existing power supply), the drive move the driven element to a preferred position (e.g. open the roller shutter)
Behaviour after BUS voltage recovery**	upper end of travel lower end of travel unchanged	Refer to the row above
Behaviour at mains voltage recovery without BUS voltage	upper end of travel lower end of travel unchanged	Even after a recovery of the mains voltage, the drive can move the driven element to a "starting position".

* For blinds ONLY

** In typical applications, the reaction after a recovery of the bus voltage is set identical to the reaction after a recovery of the mains voltage without bus voltage.

3.4.5 Channel X.Y (Parameterised for 2 Switching Outputs)

Table 1-5: Parameters on the "Channel X.Y" tabs

Designation	Values	Description
Timer functions	switch ON/OFF staircase time switch with cut out early warning impulse function ON / OFF delay	Selection of a timer function from 4 options for each of the switching outputs.
Dependence on object "Central permanent ON"	no yes	Is the Central permanent ON object to switch this channel as well?
Dependence on object "Central permanent OFF"	no yes	Is the Central permanent OFF object to switch this channel as well?
Dependence on object "Inhibit channels 1.X"	no yes	Is the inhibit object to have influence over this channel?
Behaviour after BUS voltage loss	unchanged switch ON switch OFF	Serves for taking on a defined status after a bus failure, This is important for consumers, e.g. that must not continue operation without control.
Behaviour after BUS recovery*	unchanged switch ON switch OFF trigger timer**	Similar to the previous row. Important for consumers, e.g. that must not start operating again without control.
Behaviour at mains voltage recovery without BUS voltage	switch ON remain OFF restore previous relay state	Refer to the rows above
Parameters for the staircase time switch		
Time base for staircase timer	1 sec, 10 sec, 30 sec, 1 min	To attain a maximum of flexibility, the staircase lighting time is calculated from a time base and a factor
Factor for staircase timer 1 ... 255 x Time base	Keyboard input 1 to 255	The staircase lighting time is equal to the time base multiplied by the factor. Example: Time base 10 s x factor 2 is 2 x 10 s = 20 s As soon as this time has elapsed, a cutout early warning is issued, i.e. the light is switched off for 0.25 s and then switched on again for 30s. After this, the feedback is sent (obj. 1). (The cutout early warning intervals (0.25 s and 30s) are preprogrammed and cannot be changed).

Table 1-5: continued

Designation	Values	Description
How many impulses can be added max. 1 ... 40	Keyboard input 1 to 40	A summing function enables the user to extend the programmed staircase lighting time by multiples by repeatedly actuating the light switch. Actuating it twice = double time. Here you can set, how many of these repetitions are to be permissible. It is possible at any time to start the extension sequence all over.
Parameters for the impulse function		
Time base for impulse width	1 sec, 10 sec, 30 sec, 1 min	A 1 sent to the object initiates an impulse. The length of the impulse is composed of a time base and a factor (refer to the description of the parameters for the staircase time switch)
Factor for impulse width 1 ... 255 x Time base	Keyboard input 1 to 255	The impulse width is equal to the time base multiplied by the factor. Example: Time base 10 s x factor 2 is 2 x 10 s = 20 s
Parameters for ON/OFF delay		
Time base for ON and OFF delay	1 sec, 10 sec, 30 sec, 1 min	The two delay times (ON and OFF) can be defined separately but reference the same time base.
Factor for ON-delay	Keyboard input 1 to 255	Due to the separate factors, the delay time can be set individually for the OFF and for the ON delay. Example: Time base 10 s x factor 2 is 2 x 10 s = 20 s
Factor for OFF-delay	Keyboard input 1 to 255	Example: Time base 10 s x factor 2 is 2 x 10 s = 20 s

* In typical applications, the behaviour after a recovery of the bus voltage is set identical to the behaviour after a recovery of the mains voltage without bus voltage.

**staircase timer and impulse only

4 Commissioning

The ETS database can be found at www.theben.de/downloadseite.htm#g.

4.1 Reaction without ETS Programming

Without ETS programming, all the channels are set to the "drive" mode.
Immediately after the power supply has been switched on, the outputs for upward movements are active for approx. 4 minutes.

4.2 ETS Programming without Mains Voltage

Basically, you do not need a connection to the mains voltage to program the device using the ETS. The new parameters, however, come into force only after bus as well as mains voltage was jointly present at least once.

4.3 Standard Drive Application

Enter the running time in the ETS with some reserve (stop-watch time + 20 %). Roller shutters in particular require more time for travelling up than they do for travelling down.

Standard settings recommended for the Expert functions on the "Drives general" tab for blinds.

Wait time at changing direction	0,5 s
Slippage compensation of the drives	0,6%
Automatic execution of object value "slats [%]" after object "height [%]"	enabled
Stretch-out time at lower end of travel (for secure closing)	2 s

Determining the complete slat turn for blinds:

- Set the parameters on the "Drives general" ETS tab as follows:

Allocation of the 0% Position to the objects slats [%]	0% corresponds to travel up position

- Lower the blinds until the slats no longer turn.
- Start the slat turn with the telegram "Slat [%]" with 100 % (= FF hex). The upward travel must end simultaneously with the slat turning motion.

- **Check 1**:
  The slats do not turn when the next "Up" command is issued.

- **Check 2:**
  Raise the blinds until the slats no longer turn.
  Start the slat turn with the telegram "Slat [%]" with 0 % (= 00 hex).
  The downward travel must end simultaneously with the slat turning motion.
  The slats do not turn when the next "Down" command is issued.

4.4 Expert drive application

Special procedural strategies have been set up for applications placing higher demands on accuracy. When observing the setting instructions and using high-quality blinds, identical height and angle positions can be reached directly from any position without unnecessary travel times.

4.4.1 Determining the Exact Full Running Time "Down"

The pure running time of the drive from the upper to the lower end of travel is determined.

1. Parameter settings

Automatic execution of object value "slats [%]" after object "height [%]"	disabled (for measuring the slippage)
Stretch-out time at lower end of travel (for secure closing)	0 s (to evaluate the real travel time)

- Enter a slightly lower value for Full running time "down" than required (or than the time taken using the stop-watch).

2. Perform a complete lowering operation until the LED on the controller is off.
(using the button on the device, object 0 (value 1) or object 2 (value 100 %)).

3. Perform a complete raising operation until the "Up" LED on the controller is off.
(using the button on the device, object 0 (value 0) or object 2 (value 0%)).

4. Perform a complete lowering operation until the "Down" LED on the controller is off.
(using the button on the device, object 0 (value 1) or object 2 (value 100 %)).
If the distance from the lower end of travel is substantial ⇒ increase the running time considerably
Reload the application and repeat the procedure as of item 3.

5. Otherwise issue a "down" command once more.
If the drive performs a stepwise lowering operation with further "down" commands (steps of 100 ms)
⇒ Extend the running time accordingly (if, for example, the lower end of travel is reached in 5 steps, the full running time "down" should be increased by 5).
Reload the application.

6. Perform a complete raising operation until the "Up" LED on the controller is off.

7. Perform a complete lowering operation until the "Down" LED on the controller is off.

8. Issue a "down" command once more.

8.1. If the distance from the lower end of travel is substantial ⇒ increase the running time considerably
Reload the application and repeat the procedure as of item 3.

8.2. If the drive performs a stepwise lowering operation with further "down" commands (steps of 100 ms)
⇒ extend the running time accordingly
Reload the application and repeat the procedure as of item 3.

8.3. The setting is valid if the end of travel has been reached or has been only slightly overrun.

Table 1-6: Expert parameters on the "Drives general" tab

Designation	Values	Description
Wait time at changing direction	0.3 s, 0.5 s, 0.7 s, 1 s, 1.27 s	Interval to treat the motor drive motor with care in the case of opposite commands (e.g. if a "down" command is received while travelling upward). This setting depends on the specifications of the drive manufacturer.
Slippage compensation of the drives	none, 0.2%, 0.4%, 0.6%, 0.8%, 1%, 1.5%, 2%, 3.5%, 5%, 6.2%, 8%, 12.5%	The slippage causes differing upward and downward travel times of the drive mechanism and thus prevents precise positioning to a predefined position from either direction. The slippage compensation eliminates this difference to a large extent.
Automatic execution of object value Slats [%] after object Height [%]	enabled disabled (for measuring the slippage)	Selection as to whether the height adjustment is to be restored to the slats position (according to the Slats [%]) object via the Height [%] object. This function must be inhibited when determining the slippage.
Stretch-out time at lower end of travel	0s (to evaluate the real travel time) 2 s, 6 s, 30 s	0 s for determining the real travel time. To ensure that a roller shutter is really closed, for example, a follow-on time after the lower end of travel has been reached can be parameterised. Recommendation: Short blinds/roller shutters: short time Long blinds/roller shutters: longer time

4.4.2 Determining the Slippage Compensation of the Drive Mechanisms

Refer to table 1-6: Expert parameters on the "Drives general" ETS tab

Due to the increased drive load, the asynchronous motor can perform lowering operations faster than raising operations. In the field of electrical engineering, this effect is referred to as slippage.

To be able to calculate the exact position, this slip must be entered in the ETS on the "Drives general" tab.

When observing the setting instructions and using high-quality blinds, identical height and angle positions can be reached directly from any position without unnecessary travel times.

For correctly determining the slippage, the parameter Full running time "down" (see top of page) must be set as accurately as possible.

Procedure:

- Set the following parameters in the ETS on the "Drives general" tab:

Slippage compensation of the drives	none
Automatic execution of object value "slats [%]" after object "height [%]"	disabled (for measuring the slippage)

- Have the drive mechanism travel to the top position until the LED on the actuator goes out.
- Lower the drive mechanism to the 20 % position using the Height [%] object.
- Mark the position reached or measure the height.
- Have the drive mechanism travel to the 80 % position using the Height [%] object.
- Have the drive mechanism travel repeatedly between the 20 % and the 80 % positions using the Height [%] object.
- Finally, set the drive mechanism to the 20 % position again.
- The difference in height / the offset between the marked position and the last position attained is an indicator of the slippage.

The evaluation can be performed either by way of mathematics or empiricism:

- In the case of the **empirical method**, the slippage is repeatedly adjusted and the drive mechanism raised/lowered between the 20 % and 80 % positions (see procedure described above) until the offset is minimized.

- In the case of the **mathematical evaluation**, the offset is related to the single travel distance with a percentage:

  Slippage [%] = $(L_v * 100) / (L_{total} * n)$

  where n = the number of raising operations
  L_v = the measured offset
  L_{total} = the distance between the 20 % and 80 % positions

Example: travel distance from 20% to 80%: 200 cm, offset: 4.8 cm, number of raising operations from 80% to 20%: 3

Slippage [%] = (4.8 * 100) / (200 * 3) = 0.8 %

Annotation:
The mechanical properties of blinds may change due to ageing, thus requiring an adjustment of the settings.

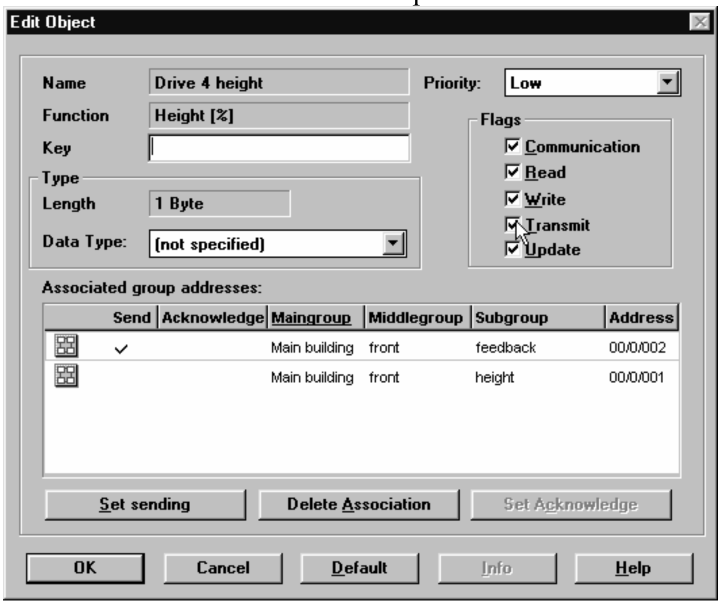
4.4.3 Feedback of the Drive Mechanism Height and Slat Positions

In the ETS, the Height [%] object can additionally be parameterised as a feedback object that sends a new position to the bus as a percentage.
The value sent refers to the parameterised total running time of the drive mechanism.

Procedure (ETS projection):
- Highlight the object
- Open the "Edit Object" window (double-click on the object)
- Highlight the desired group address
- click on the "Set sending" button and activate the "Transmit" checkbox
- confirm your input

The same procedure can be used for the Slats [%] object.

Example:
Address 02/0/051 Control of the drive mechanism height for several drive mechanisms
Address 02/0/052 Feedback of the position of drive 4



IMPORTANT:
A feedback address must never be connected to another actuator input!

Annotation:
- A noticeable deviation between the value sent and the nominal value is attributable to conversion and rounding.
- For height and position objects polling:
  If a new value is transmitted to one of those objects during auto comfort or safety mode, the old value will be cleared by the new one, but the drive will remain in its prior position.
  In this case, the object value will not display the real drive position.

5 Operation

5.1 Operating Controls

5.1.1 Buttons

The buttons are used to switch the relays on and off.
Via an ETS parameter on the General tab you can lock the keyboard to protect it against unauthorized use.

If a channel is parameterised as a drive mechanism, the up and down relays are locked relative to each other, i.e. they cannot be switched on at the same time.

5.1.2 Light Emitting Diodes

Functions:

- Display of the relay statuses.
- Flashing upon actuation when the keyboard is locked or a priority is active. (Also refer to the appendices "Priority Order of the Switching Output Controller / of the Drive Controller").

5.2 Manual Mode

The manual mode is selected by pressing the manual key on the device.
The conditions for exiting this mode can be parameterised (refer to Table 1-1: Parameters on the "General" tab).

5.2.1 Manual Mode for Drive Channels

In this mode, the drives can be moved manually via the device.
All the bus telegrams not relevant for security aspects are locked, i.e.:
only the security instructions (sent to obj. 40...42) and the forced up/down commands will still be executed.

5.2.2 Manual Mode for Switching Channels

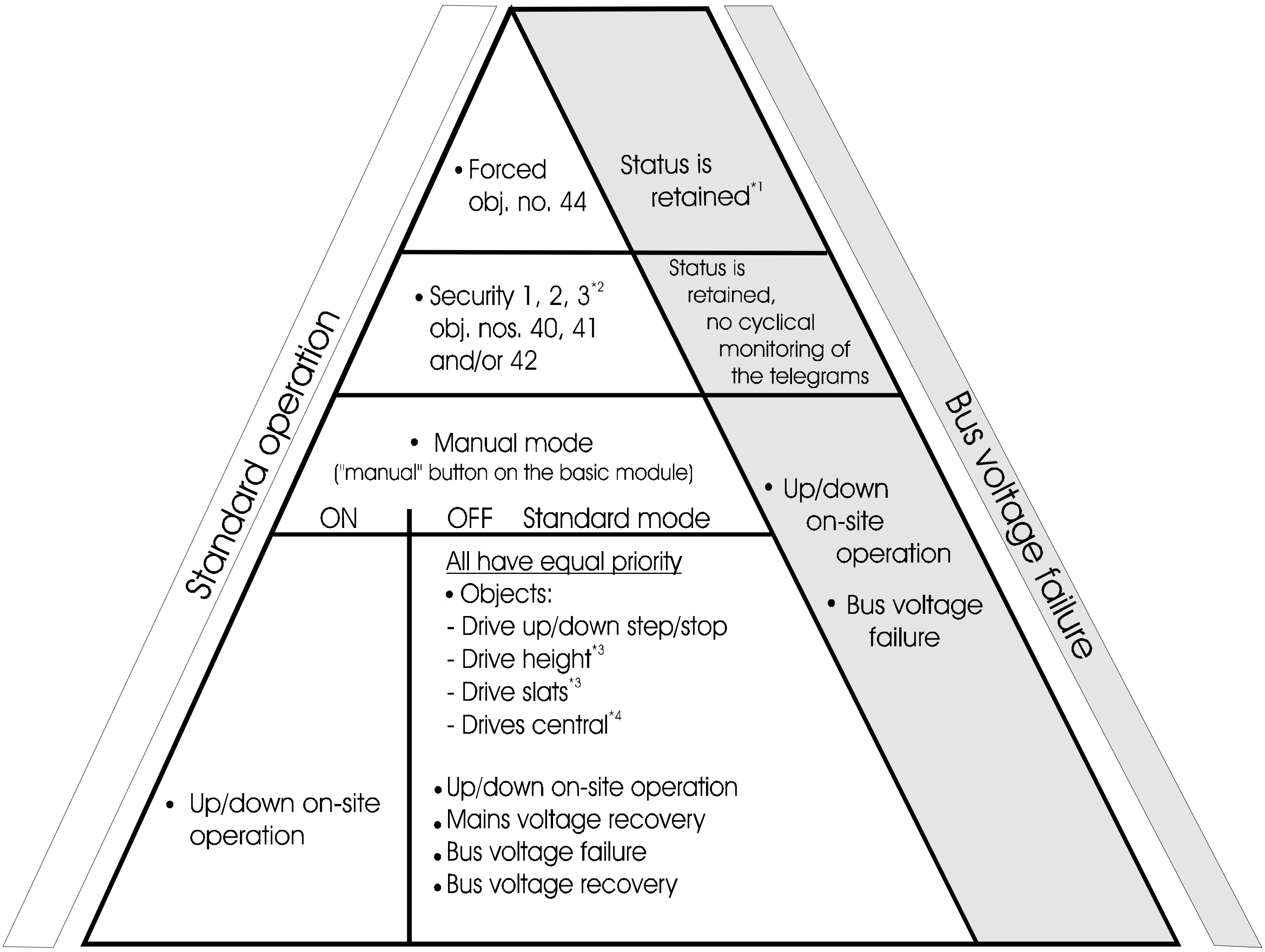
In manual mode, the individual switching channels can only be switched on and off manually at the device.
All the bus telegrams are inhibited, i.e. bus commands will not be executed.

5.3 Important Note

Element / operating condition	Note
Bus connection without ETS programming	Without ETS programming, the channels are set to the "drive" application Immediately after the power supply has been switched on, the outputs for upward movements are active for approx. 4 minutes.
Change of channel functions	When changing the function of channels from switching channel to drive (or vice versa), the device must be reset by interrupting the power supply (for at least 2 s).
Operation without EIB voltage	The actuator stores the position of the driven element after each stop. This enables precise travelling to a new position from any other position. To be able to perform the store the position correctly, bus voltage and the application program must be present. If the position of the drive is manually changed during a bus voltage failure, any deviation will be compensated at the latest after the next complete movement to the upper end of travel.
Forced object	If a forced object is used, data should always be sent to it cyclically.
Cyclic sending time to the objects security 1 3	Should be half of the monitoring time parameterised for the actuator.
Use of the security objects 1, 2 and 3 (objects 40, 41, 42)	A security object may be controlled by one device only. Otherwise different commands may cancel each other.

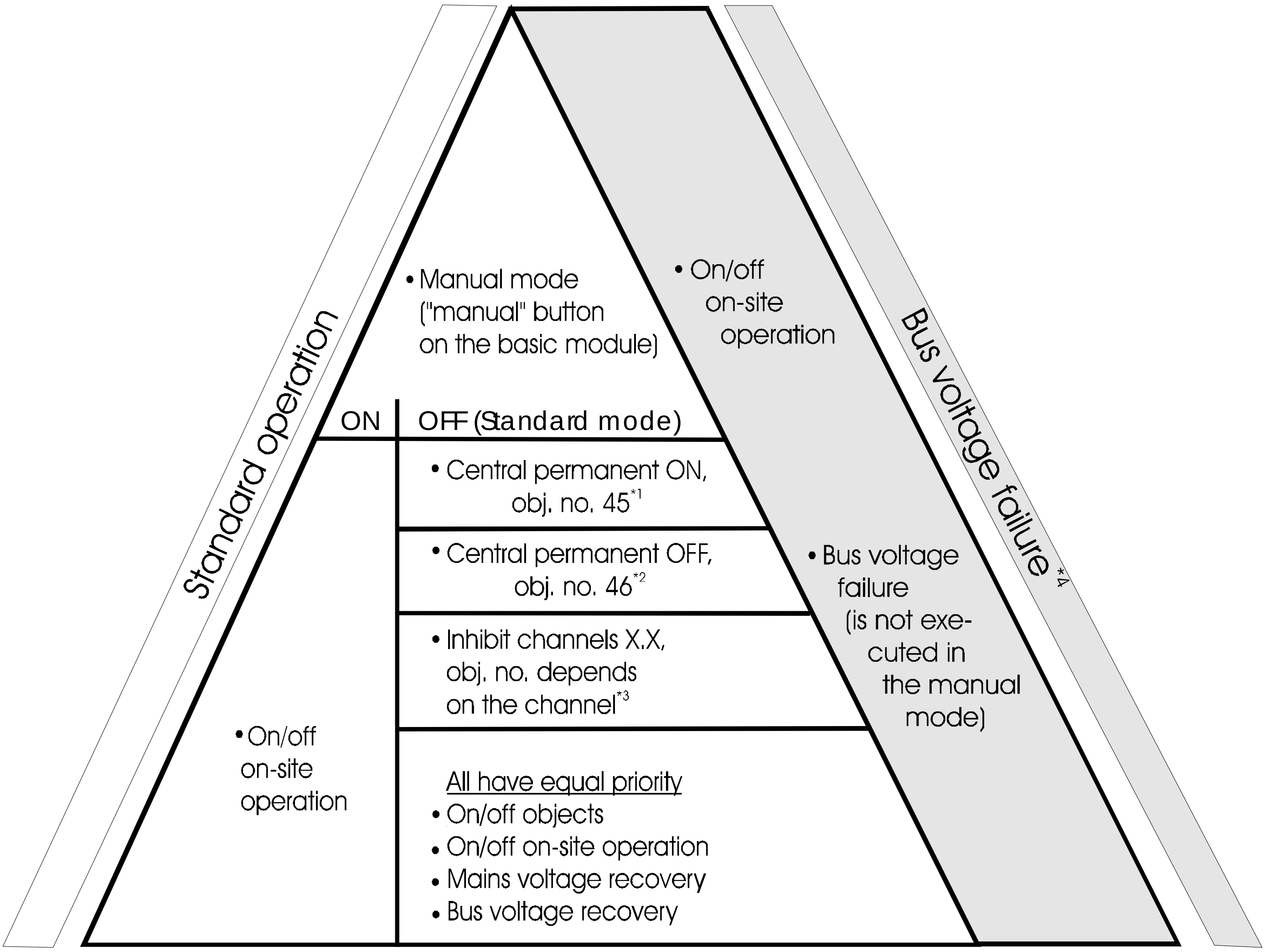
6 Appendices

6.1 Priority Order of the Drive Controller



*1 and is stored in the case of a mains voltage failure
*2 If ETS parameter "Security" is selected accordingly
*3 If the associated "Auto comfort" object = 0 is active
*4 If the ETS parameter Dependence on object "drives central up/down" is set to "yes"

6.2 *Priority Order of the Switching Output Controller*



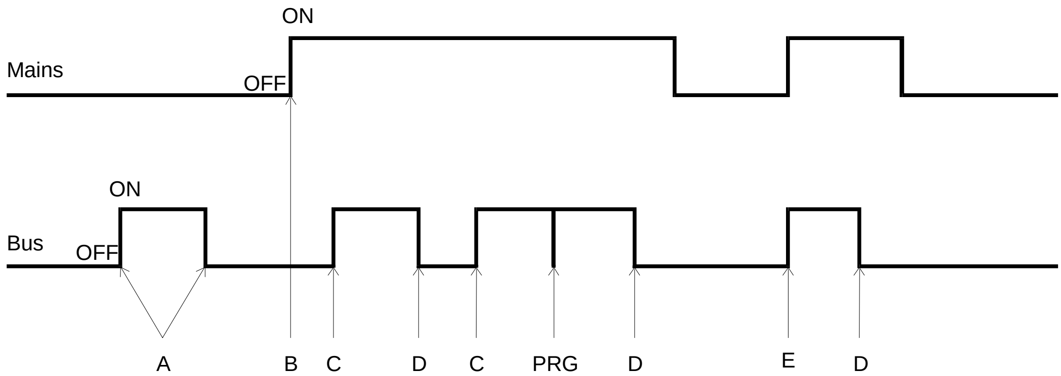
*1 If the ETS parameter Dependence on object "Central permanent ON" is set to "yes"
*2 If the ETS parameter Dependence on object "Central permanent OFF" is set to "yes"
*3 If the ETS parameter Dependence on object "inhibit channels X.X" is set to "yes"
*4 Relay statuses are retained or already issued commands are executed or replaced with the ETS settings for bus voltage failure

Converting Percentages to Hexadecimal and Decimal Values

Percentage	**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 the values from hex 00 to FF (decimal 0 to 255) are valid.

6.3 Definition: Mains Voltage Recovery and Bus Voltage Failure



Case	Designation	active parameter or reaction
A	Bus voltage recovery and failure without mains voltage	No reaction, relay is always off
B	Mains voltage recovery without bus voltage	Behaviour at mains voltage recovery without bus voltage
C	Bus voltage recovery	Behaviour after bus voltage recovery
D	Bus voltage failure	Behaviour after bus voltage loss
PRG	Programming with ETS: Corresponds to bus voltage failure + bus voltage recovery	Behaviour after bus voltage loss Behaviour after bus voltage recovery
E	Bus and mains voltage failure simultaneously	Behaviour after bus voltage recovery*

* if the parameter “unchanged” is selected, the relay will remain OFF.

6.4 Troubleshooting

Indicator / Error	Possible cause / Remedy
Power LED flashes	Indicates that the Key has been plugged
	An RME 8 or RMX 4 extension module was parameterised but is either defective or not available.
	No EIB connection, no bus voltage
	ETS application not loaded or device is being programmed.
Communication problems with the ETS	1. Disconnect the EIB from the actuator 2. Press the programming button and keep it depressed 3. Connect the EIB again 4. As soon as the programming LED lights up, the button can be released again
Manual mode LED flashes with the Key plugged after actuating the manual button.	Remove the Key briefly.

6.5 Block Diagram of the Switching Output Controller