

**20 A1 Actuator-BCU Shutter 902802****Use of the application program**

Product family: Input/output  
Product type: Binary/binary  
Manufacturer: Siemens

Name: Shutter switch UP 520/01  
Order no.: 5WG1 520-2AB01

**Functional description**

With the application program "20 A1 Actuator-BCU Shutter 902802", the output of the shutter switch can be used to control a shutter, roller blind or skylight. The following functions can be assigned independently to the four rockers of the 4-fold push button DELTA ambiente that is connected to its physical external interface: switching (on/off/toggle/value), dimming (on/off or brighter/darker), controlling shutters, skylights and security gates etc. or recalling/programming scenes. There is a separate communication object available for each rocker contact. The LEDs can be parameterised for status display or as an orientation light.

**Functions of the push buttons or rockers**

The term "rocker" is currently used here in parallel to the switch rockers. A pair of push buttons, consisting of the upper push button and the push button underneath, always forms a rocker or a switching channel.

**Switching**

A separate communication object is available for each rocker contact of the four rockers. It is therefore possible to switch up to eight different groups of luminaires. It is possible to set via parameters which switch function (on/off/toggle) is carried out when the rocker is pressed or released. An 8-bit value can also be assigned to each rocker contact. The corresponding value is sent immediately once the rocker has been pressed. It is therefore possible for a dimming actuator for example to be set to a defined value.

**Dimming**

A distinction is made between a short and long push button action. A short push button action sends a corresponding switching command (on or off). If the push button is pressed and held down for a longer period (the duration of which can be set), a dimming command is sent. The functions of "Dimming with stop telegram" and "Dimming with cyclical sending" are available. If "Dimming with stop telegram" is selected, a long push button action sends a command to the dimming object to dim by 100%. When the rocker is released, a stop command is sent. If "Dimming with

cyclical sending" is selected, a dimming command is sent at set intervals for the duration of the push button action. It is also possible to assign parameters to the adjustment of the brightness value per dimming command (e.g. adjust by 1/8).

**Shutter control**

A distinction is made between a short and long push button action. If the rocker is pressed briefly, a switching telegram is sent which adjusts the louvres or stops any shutter movement. After a long push button action, the shutters are either raised or lowered. When assigning parameters, it is possible to choose between "Upper contact: Up, Lower contact: Down" or vice versa. Skylights and security gates for example can be controlled in both directions using this parameter. In this case the Up command corresponds to the Off command and the Down command corresponds to the On command.

**Scene**

Using the "Scene" function, users are able to reprogram a scene module themselves without changing the project design in ETS i.e. they can assign other brightness values or switching states to the individual groups of the respective scene. Two scenes can be recalled by pressing the rocker briefly (e.g. upper contact: scene 1, lower contact: scene 2) while a long rocker operation is used to program them. The scene is recalled via a 1 bit switching command, whereby scene 1 is recalled with a "0" telegram and scene 2 is recalled with a "1" telegram. It is possible to specify in the parameters which telegrams are sent by the upper and lower rocker contacts. The scene is saved via a 1 bit switching command, whereby scene 1 is saved with a "0" telegram and scene 2 is saved with a "1" telegram. An application with this type of function must also be used in the scene module. Before programming a scene, the actuators concerned must be set to the required brightness values or switching states using the sensors provided. The scene modules that have been addressed are requested on receipt of a telegram to scan the current brightness values and switching states of the actuators and to store them in the corresponding scene. A long rocker operation is indicated by the LED lighting up. It is possible to specify the period that distinguishes a short and long push button action.

**LED**

The push button has five LEDs. Four communication objects are available for the upper four LEDs of the push button. They can be used either to display the switching states or as an orientation light if the corresponding parameters have been selected. The centre LED serves as an orientation light.

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### Functions of the shutter output

#### Shutter (Roller blind), Up/Down

When the "Up/Down" object receives a telegram, the shutter (roller blind) is moved in the required direction for a set period. The shutter is raised if the object value is "0" and lowered if the object value is "1". The shutter or roller blind can also be controlled via a dimming object. In this setting, the shutter (roller blind) and louvre objects are inverted to achieve a synchronisation with the push buttons that are being used.

The relays are automatically opened once the set period for shutter or roller blind movement has elapsed. If the shutter (blind) is already travelling in a certain direction and "Up/Down" telegrams are received to move the shutter in the opposite direction, the shutter (blind) first stops for a set interval before it changes direction. This "Pause on change in direction" depends on the shutter motor that is being used and information should be obtained from the manufacturer.

When the shutter is lowered, it is completely closed. For this reason, it is possible to set a period ("Delay time on a direction change") which causes the shutter motor to move in another direction and thus leads to louvre adjustment. This is also the case if the lowering of the shutter is interrupted by a stop telegram. The time set for the "Pause on change in direction" is observed.

#### Louvres, Open/Closed

The behaviour of the shutter on receipt of a telegram for louvre adjustment depends on the current status of the shutter. If the shutter is travelling in a specific direction, the shutter movement is stopped. In the case of a roller blind, the receipt of a louvre adjustment telegram functions like a stop telegram. If the roller blind is stationary, it has no effect. During louvre adjustment, if another telegram is received to rotate the louvres in the same direction, the adjustment period is extended. If however a telegram is received to rotate the louvres in the opposite direction, the command is carried out once the pause on change in direction has been observed. If the shutter is stationary, a louvre adjustment telegram leads to shutter movement in the required direction.

Once the set period for movement has elapsed (normally 150 ms to 200 ms), the shutter motor is automatically switched off. If a shutter is lowered (without reverse step), the louvres remain closed in this direction. If the shutter is stopped and then raised step by step (louvre adjustment), the louvres are opened first of all and then rotated upwards again. If the louvres are completely closed, further telegrams to rotate the louvres in the same direction cause the shutters to be moved step by step in this direction.

#### Safety object (wind alarm)

The safety function can be enabled or disabled. In the event of an alarm signal, a "1" is received by the safety object and the shutters are raised. The safety position of the roller blinds can be selected.

The safety object expects to receive cyclical telegrams from the signalling device (e.g. wind sensor) for monitoring purposes. Even if there is no alarm, the sensor must send telegrams with the value "0" (no alarm) at a set time interval (monitoring time). If the telegrams fail to appear, the shutters are also moved to the safety position. The object value of the safety object is thus set internally to "1" (alarm). The current alarm status can be read out via the safety object (if the safety function is enabled). If the safety position has been activated, the shutters/roller blinds can no longer be controlled via "Up/Down" or louvre adjustment telegrams. If the shutter or roller blind is moved to the safety position, thereby changing direction, the time set in the parameter "Pause on change in direction" is observed. The relays are not opened once the period for shutter or roller blind movement has elapsed. This guarantees that the shutter/roller blind reaches the safety position. The shutter/roller blind can only be operated once the safety object receives a telegram with the value "0" (no alarm).

#### Bus voltage failure and recovery

The shutter or roller blind is switched off on bus voltage recovery.

The shutter and roller blind can be moved up, moved down or stopped on bus voltage failure. In the event of a bus voltage failure, the pause on change in direction that is normally observed is not taken into account. This means for example that if a shutter is currently being lowered, it will change direction after approx. 20 ms. Shutter motors that require a pause are not able to carry out this change in direction. If the relay contacts were already opened before the bus voltage failure, the functionality is not taken into account. When operating heavy roller blind motors, the parameter setting "STOP" should be selected in order to protect the relay contacts.

#### Automatic opening of the relays

It is possible to prevent the relays from opening automatically (via the parameter "Function of louvres" in the "Shutter" parameter window). This deactivation takes effect if the relay has been closed for example by an "Open/Closed" telegram. Once a motor has been set in motion, it can then only be brought to a halt with a stop telegram (necessary for reverse circuits). For this reason, the louvre adjustment telegram is always interpreted as a stop telegram. This is also the case when the shutter is stationary (louvre adjustment telegrams no longer exist).

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### WARNING

When using the shutter switch UP 520/01 for roller blind drive mechanisms, the following should be noted when assigning parameters:

(It can otherwise lead to welding of the contacts).

- The parameter "Pause on change in direction" must be set to the time given by the manufacturer of the roller blind (generally longer than 500 ms).
- The parameter "Behaviour on bus voltage failure" should be set to "STOP".

### Assigning parameters to the rockers

#### Switch

##### Communication objects

Phys.Addr.		Program		
no.	Object name	Function	Type	
01.01.001	20 A1 Actuator-BCU Shutter 902802			
0	Switch, upper small button left	On	1 Bit	
1	Switch, lower small button left	Off	1 Bit	
2	Switch, upper large button left	On	1 Bit	
3	Switch, lower large button left	Off	1 Bit	
4	Switch, upper large button right	On	1 Bit	
5	Switch, lower large button right	Off	1 Bit	
6	Switch, upper small button right	On	1 Bit	
7	Switch, lower small button right	Off	1 Bit	
...	...	...	...	...

Obj	Object name	Function	Type	Flag
0	Switch, upper small button left	On	1 Bit	CT
1	Switch, lower small button left	Off	1 Bit	CT

The switching telegrams of the push buttons are sent via the group addresses in these objects. The switching state which is generated when the push buttons are pressed or released must be set via parameters. In the "Toggle" setting, all the central addresses present in the actuator must be entered here to synchronise the sensor.

#### Note

The "Switch" function of objects 2-7 of the remaining push buttons corresponds to that of objects 0 and 1. These objects are therefore not described in detail.

### Parameters

LED	Small buttons left	Large buttons left	Large buttons right	Small buttons right	Shutter
Function	Switch				
Upper push button	On				
Lower push button	Off				

The function and parameters of the small left push buttons are identical to the other push buttons and are therefore not described in detail.

Parameters	Settings
Function	Switch Shutter Dimming with stop telegram Dimming with cyclical sending Scene (recall / save)

The function of the push buttons is set via these parameters. The parameter window "Small buttons left" changes depending on the function set in this parameter and the associated parameters are displayed with their default settings.

Upper push button	Off On Toggle 8-bit Value press: On, release: Off press: Off, release: On
Lower push button	Off On Toggle 8-bit Value press: On, release: Off press: Off, release: On

This parameter determines which switching value is sent via the corresponding switching object when the upper and lower push buttons are pressed or released.

"On" or "Off": An "On" or "Off" telegram is sent when the push button is pressed. No evaluation occurs when the push button is released.

"Toggle": When the push button is pressed, the value present in the switching object is inverted. No evaluation occurs when the push button is released.

"8-bit Value": Pressing the push button causes a set 8-bit value to be sent. In this setting, a parameter for defining the value is also displayed. No evaluation occurs when the push button is released.

"press: On, release: Off": When the push button is pressed, an "On" telegram is sent while an "Off" telegram is sent when the push button is released (bell function).

"press: Off, release: On": When the push button is pressed, an "Off" telegram is sent while an "On" telegram is sent when the push button is released.

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## Dimming with stop telegram

## Communication objects

Phys.Addr.		Program		
no.	Object name	Function	Type	
01.01.001	20 A1 Actuator-BCU Shutter 902802			
0	Dimming On / Off, small buttons left	On / Off	1 Bit	
1	Dimming, small buttons left	Brighter / Darker	4 Bit	
2	Dimming On / Off, large buttons left	On / Off	1 Bit	
3	Dimming, large buttons left	Brighter / Darker	4 Bit	
4	Dimming On / Off, large buttons right	On / Off	1 Bit	
5	Dimming, large buttons right	Brighter / Darker	4 Bit	
6	Dimming On / Off, small buttons right	On / Off	1 Bit	
7	Dimming, small buttons right	Brighter / Darker	4 Bit	
...	...	...	...	...

Obj	Object name	Function	Type	Flag
0	Dimming On / Off, small buttons left	On / Off	1 Bit	CT
1	Dimming, small buttons left	Brighter / Darker	4 Bit	CT

The switching telegrams of the small left buttons are sent via the group addresses in this object. The switching state which is generated when the upper or lower push buttons are pressed must be set via parameters. In the "Toggle" setting, all the central addresses present in the actuator must be entered here to synchronise the sensor.

This object is used as a dimming object for the small left buttons and sends a dimming telegram after a long push button action. The dimming telegrams that are sent when the upper or lower push buttons are pressed must be set via parameters.

## Note

The function "Dimming with stop telegram" of objects 2-7 of the remaining push buttons corresponds to that of objects 0 and 1. These objects are therefore not described in detail.

## Parameters

LED	Small buttons left	Large buttons left	Large buttons right	Small buttons right	Shutter
Function	Dimming with stop telegram				
Upper / Lower push button	On / Off				
Long switch operation min.	0.5 seconds				

The functions and parameters of all the push buttons are identical.

Parameters	Settings
Function	Switch Shutter <b>Dimming with stop telegram</b> Dimming with cyclical sending Scene (recall / save)
Upper / Lower push button	On / Off Toggle / Toggle
Long switch operation min.	0.3; 0.4; <b>0.5</b> ; 0.6; 0.8; 1.0; 1.2; 1.5; 2.0; 2.5; 3.0; 4.0; 5.0; 6.0; 7.0 seconds
	This parameter defines the time period for a short/long push button action. If a push button is pressed for longer than the set time, it is evaluated by the push button as a long switch operation and dimming telegrams are sent.

## Dimming with cyclical sending

## Communication objects

Phys.Addr.		Program		
no.	Object name	Function	Type	
01.01.001	20 A1 Actuator-BCU Shutter 902802			
0	Dimming On / Off / Toggle, small buttons left	On / Off / Toggle	1 Bit	
1	Dimming, small buttons left	Brighter / Darker	4 Bit	
2	Dimming On / Off / Toggle, large buttons left	On / Off / Toggle	1 Bit	
3	Dimming, large buttons left	Brighter / Darker	4 Bit	
4	Dimming On / Off / Toggle, large buttons right	On / Off / Toggle	1 Bit	
5	Dimming, large buttons right	Brighter / Darker	4 Bit	
6	Dimming On / Off / Toggle, small buttons right	On / Off / Toggle	1 Bit	
7	Dimming, small buttons right	Brighter / Darker	4 Bit	
...	...	...	...	...

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Obj	Object name	Function	Type	Flag
0	Dimming On / Off / Toggle, small buttons left	On / Off / Toggle	1 Bit	CWT
1	Dimming, small buttons left	Brighter / Darker	4 Bit	CT

The switching telegrams of the small left push buttons are sent via the group addresses in this object. The switching state which is generated when the upper or lower push buttons are pressed must be set via parameters. In the "Toggle" setting, all the central addresses present in the actuator must be entered here to synchronise the sensor.

This object is used as a dimming object for the small left buttons and sends a dimming telegram after a long push button action. The dimming telegrams that are sent when the upper or lower push buttons are pressed must be set via parameters.

### Note

The function "Dimming with cyclical sending" of objects 2-7 of the remaining push buttons corresponds to that of objects 0 and 1. These objects are therefore not described in detail.

### Parameters

LED	<b>Small buttons left</b>	Large buttons left	Large buttons right	Small buttons right	Shutter
Function			<b>Dimming with cyclical sending</b>		
Upper / Lower push button				<b>On / Off, Step=1/8</b>	
Long switch operation min.					<b>0.5 seconds</b>
Interval for cyclical sending					<b>0.5 seconds</b>

The functions and parameters of all the push buttons are identical.

Parameters	Settings
<b>Function</b>	Switch Shutter Dimming with stop telegram <b>Dimming with cyclical sending</b> Scene (recall / program)

The function of the push button is specified via this parameter. The parameter window "Small buttons left" changes depending on the function set in this parameter and the associated parameters are displayed with default settings.

Parameters	Settings
<b>Upper / Lower push button</b>	On / Off, Step = 1/1 On / Off, Step = 1/2 On / Off, Step = 1/4 <b>On / Off, Step = 1/8</b> On / Off, Step = 1/16 On / Off, Step = 1/32 On / Off, Step = 1/64 Toggle / Toggle, adjustment = 1/1 Toggle / Toggle, adjustment = 1/4 Toggle / Toggle, adjustment = 1/8 Toggle / Toggle, adjustment = 1/16 Toggle / Toggle, adjustment = 1/32 Toggle / Toggle, adjustment = 1/64

This parameter determines which switching value is sent when the upper and lower push buttons are pressed briefly and which brightness adjustment is carried out by a dimming telegram on detection of a long push button action. For example, in the setting "adjustment = 1/8", 8 dimming telegrams must be sent in order to dim from 0% to 100%.

"On / Off, Step = x": A short operation of the upper push button sends an "On" telegram while an "Off" telegram is sent when the lower push button is pressed briefly. "Dim brighter" telegrams are sent after a long operation of the upper push button while "Dim darker" telegrams are sent when the lower push button is pressed for a longer period.

"Toggle / Toggle, Step = x": After a short push button action, the value present in the switching object is inverted. The dimming function is maintained as in the setting "On / Off, Step = x".

<b>Long switch operation min.</b>	0.3; 0.4; <b>0.5</b> ; 0.6; 0.8; 1.0; 1.2; 1.5; 2.0; 2.5; 3.0; 4.0; 5.0; 6.0; 7.0 seconds
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This parameter defines the time period for a short/long push button action. If a push button is pressed for longer than the set time, it is evaluated by the push button as a long switch operation and dimming telegrams are sent.

<b>Interval for cyclical sending</b>	0.3; 0.4; <b>0.5</b> ; 0.6; 0.8; 1.0; 1.2; 1.5; 2.0; 2.5; 3.0; 4.0; 5.0; 6.0; 7.0 seconds
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This parameter specifies the interval for cyclical sending after a long push button action. The bus load must be taken into consideration when setting the cyclical interval.

**Application program description**

January 2002

**20 A1 Actuator-BCU Shutter 902802****Shutter****Communication objects**

Phys.Addr.		Program		
no.	Object name	Function	Type	
<b>01.01.001</b> 20 A1 Actuator-BCU Shutter 902802				
0	Louvres, small buttons left	Open / Closed	1 Bit	
1	Shutter, small buttons left	Up / Down	1 Bit	
2	Louvres, large buttons left	Open / Closed	1 Bit	
3	Shutter, large buttons left	Up / Down	1 Bit	
4	Louvres, large buttons right	Open / Closed	1 Bit	
5	Shutter, large buttons right	Up / Down	1 Bit	
6	Louvres, small buttons right	Open / Closed	1 Bit	
7	Shutter, small buttons right	Up / Down	1 Bit	
...	...	...	...	...

Obj	Object name	Function	Type	Flag
0	Louvres, small buttons left	Open / Closed	1 Bit	CT
This object sends a switching command for louvre adjustment after a short push button action. The switching command that is generated when the push button is pressed must be set via parameters.				
1	Shutter, small buttons left	Up / Down	1 Bit	CT

This object sends a switching command to raise or lower the shutter after a long operation of the push buttons. The switching command that is generated when the upper or lower push buttons are pressed must be set via parameters.

**Note**

The "Shutter" function of objects 2-7 of the remaining push buttons corresponds to that of objects 0 and 1. These objects are therefore not described in detail.

**Parameters**

LED	Small buttons left	Large buttons left	Large buttons right	Small buttons right	Shutter
Function	Shutter				
Upper / Lower push button	Up / Down				
Long switch operation min.	0.5 seconds				

The function and parameters of all the push buttons are identical.

Parameters	Settings
Function	Switch Shutter Dimming with stop telegram Dimming with cyclical sending Scene (recall / program)
The function of the push button is specified via this parameter. The parameter window "Small buttons left" changes depending on the function set in this parameter and the associated parameters are displayed with default settings.	
Upper / Lower push button	Up / Down Down / Up
This parameter defines the switching command for the upper and lower push buttons. In the default setting, a short operation of the upper push button opens the louvre by a step with an "Off" telegram. A short operation of the lower push button closes the louvre by a step with an "On" telegram. A long operation of the upper push button raises the shutter with an "Off" telegram and a long operation of the lower push button closes the shutter with an "On" telegram.	
Long switch operation min.	0.3; 0.4; 0.5; 0.6; 0.8; 1.0; 1.2; 1.5; 2.0; 2.5; 3.0; 4.0; 5.0; 6.0; 7.0 seconds
This parameter defines the time period for a short/long push button action. If a push button is pressed for longer than the set time, it is evaluated by the push button as a long switch operation.	

**Scene****Communication objects**

Phys.Addr.		Program		
no.	Object name	Function	Type	
<b>01.01.001</b> 20 A1 Actuator-BCU Shutter 902802				
0	Scene, small buttons left	Recall	1 Bit	
1	Scene, small buttons left	Save	1 Bit	
2	Scene, large buttons left	Recall	1 Bit	
3	Scene, large buttons left	Save	1 Bit	
4	Scene, large buttons right	Recall	1 Bit	
5	Scene, large buttons right	Save	1 Bit	
6	Scene, small buttons right	Recall	1 Bit	
7	Scene, small buttons right	Save	1 Bit	
...	...	...	...	...

Obj	Object name	Function	Type	Flag
0	Scene, small buttons left	Recall	1 Bit	CT
The telegrams for recalling the scene are sent via the group address in this object. On receipt of the telegram, the scene module sends the stored brightness values of the scene to the addressed switch/dimming actuators via the group objects.				

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Obj	Object name	Function	Type	Flag
1	Scene, small buttons left	Save	1 Bit	CT
The save telegrams are sent to the corresponding scene module via the group address in this object.				

### Note

The "Scene" function of objects 2-7 of the remaining push buttons corresponds to that of objects 0 and 1. These objects are therefore not described in detail.

### Parameters

LED	Small buttons left	Large buttons left	Large buttons right	Small buttons right	Shutter
Function	Scene (recall / save)				
Upper / Lower push button	0 / 1				
Start to save scene at	5.0 seconds				

The function and parameters of all the push buttons are identical.

Parameters	Settings
Function	Switch Shutter Dimming with stop telegram Dimming with cyclical sending Scene (recall / save)
Upper / Lower push button	0 / 1 1 / 0
This parameter defines the sending signal when the push buttons are pressed. "0 / 1": After a short operation of the upper push button, scene 1 is set with a "0" telegram from the addressed scene modules. Scene 2 is set with a "1" telegram from the addressed scene modules after a brief operation of the lower push button. After a long operation of the push buttons, the scene modules are requested to scan the current brightness values and switching states of the actuators and to store them in the corresponding scenes. "1 / 0": The assignment of the scenes to the push buttons is exchanged in this setting.	

Parameters	Settings
Start to save scene at	0.3; 0.4; 0.5; 0.6; 0.8; 1.0; 1.2; 1.5; 2.0; 2.5; 3.0; 4.0; <b>5.0</b> ; 6.0; 7.0 seconds

This parameter indicates the operating time of the rocker which distinguishes between the recalling of the scene and the transfer to memory.

Push button action shorter than the set time: The scene is recalled.

Push button action longer than the set time: Operation is switched to the save mode of the scene.

### LED

#### Communication objects

no.	Phys.Addr.	Program		
		Object name	Function	Type
01.01.001	20 A1 Actuator-BCU Shutter	902802		
...	...	...	...	...
8	LED (upper small button left)		Status	1 Bit
9	LED (upper large button left)		Status	1 Bit
10	LED (upper large button right)		Status	1 Bit
11	LED (upper small button right)		Status	1 Bit
...	...	...	...	...

Obj	Object name	Function	Type	Flag
8	LED (upper small button left)	Status	1 Bit	CRW
9	LED (upper large button left)	Status	1 Bit	CRW
10	LED (upper large button right)	Status	1 Bit	CRW
11	LED (upper small button right)	Status	1 Bit	CRW
The switching telegrams are received via the group addresses in these objects when the 4 LEDs are used for status display. If the setting "On" or "Off" is selected for the corresponding LED in the parameter window "LED", the associated object is not displayed and therefore has no function.				

### Parameters

LED	Small buttons left	Large buttons left	Large buttons right	Small buttons right	Shutter
Orientation light (LED)	Off				
LED placed by upper small button left	Off				
LED placed by upper large button left	Off				
LED placed by upper large button right	Off				
LED placed by upper small button right	Off				

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Parameters	Settings
Orientation light (LED)	Off On
	With this parameter, the lower LED can be switched off or used as an orientation light.
LED placed by upper small button left	Off On Status (via separate object) Inverted (via separate object)
LED placed by upper large button left	Off On Status (via separate object) Inverted (via separate object)
LED placed by upper large button right	Off On Status (via separate object) Inverted (via separate object)
LED placed by upper small button right	Off On Status (via separate object) Inverted (via separate object)
	The LEDs can be parameterised as an orientation light or for status display. When the LEDs are used for status display, a separate object is available for each LED. The status can likewise be shown as inverted.

Obj	Object name	Function	Type	Flag
14	Wind alarm	Shutter Up	1 Bit	CRW
	This object can be linked with a safety address e.g. from an anemometer. The anemometer sends a logic "0" at cyclic intervals in the idle state and sends a logic "1" in the event of a wind alarm. After a wind alarm, the shutter switch moves the shutter into the safety position and disables operation. The same occurs if the wind sensor fails and is no longer able to send cyclical "0" signals. This object is only available if the parameter "Safety" has been set to "enabled"			
15	Shutter using dimming	Up/Down using Brighter/Darker	4 Bit	CW
	A dimming sensor can control a shutter via this object, whereby the shutter is raised when dimming brighter and lowered when dimming darker. All the dimming telegrams are interpreted as an adjustment by 100%, as the actuator does not know the current position. For this reason, it is advisable to only select the configuration "Dimming with stop telegram" for the dimming sensor.			
	This object is only available if the parameter "Shutter control using dim. command" has been set to "enabled". The object value of "Shutter" and "Louvre" is likewise inverted. This enables the object of the short push button action for the shutter to be linked with the "Louvre" object. The louvre thus opens / closes after a short push button action (upper -> brighter; lower -> darker).			

## Assigning parameters to the shutter output

## Communication objects

Phys.Addr.		Program		
no.	Object name	Function	Type	
01.01.001	20 A1 Actuator-BCU Shutter 902802			
...	...	...		
12	Shutter	Down / Up	1 Bit	
13	Louvres	Open / Closed	1 Bit	
14	Wind alarm	Shutter Up	1 Bit	
15	Shutter using dimming	Up/Down using Brighter/Darker	4 Bit	
...	...	...		

Obj	Object name	Function	Type	Flag
12	Shutter	Up / Down	1 Bit	CW
	Shutter movement (Up / Down) is initiated with this object. The shutter is raised on receipt of a logic "0" and lowered on receipt of a logic "1".			
13	Louvres	Open / Closed	1 Bit	CW
	This object is used for louvre adjustment. The louvre is rotated in the "Open" direction on receipt of a logic "0" and rotated in the "Closed" direction on receipt of a logic "1".			

## Parameters

LED	Small buttons left	Large buttons left	Large buttons right	Small buttons right	Shutter
Function	Shutter				
Function of louvres (step)	using object, without reverse step after stop				
Time for shutter movement	12 minutes				
Time for louvres adjustment	200 milliseconds				
Pause on change in direction	700 milliseconds				
Shutter control using dim. command	enabled (Up/Down are changed)				
Behaviour on bus voltage failure	move shutter up				
Safety (e.g. wind alarm)	enabled				
Safety position of shutter	Up				
Monitoring time	12 minutes				

**20 A1 Actuator-BCU Shutter 902802**

Parameters	Settings
<b>Function</b>	<b>Shutter</b> Roller blind
The function of the shutter switch is set via this parameter. The parameter window changes depending on the function selected and the relevant parameters are displayed with default settings.	
<b>Function of louvres (step)</b>	<b>using object, without reverse step after stop</b> using object, with reverse step after stop using shutter up/down with stop telegram
The reaction to the receipt of a louvre adjustment telegram at the louvre object is set via this parameter. “using object, without reverse step after stop”: The louvre adjustment command is carried out without a reverse step and the relay is opened once the period for louvre adjustment has elapsed. “using object, with reverse step after stop”: The same as “using object, without reverse step after stop” except that when lowering the shutter, a louvre step is carried out in the “Up” direction after the stop, so that the louvres can be opened. In this setting, the parameter for defining the duration of the reverse step is displayed. “using shutter up/down with stop telegram”: The louvre adjustment telegram is interpreted as a stop telegram to halt the shutter movement. The automatic relay disconnection is deactivated. In this setting, the louvre object is modified and displayed as a stop object.	
<b>Time for shutter movement</b>	10; 30 seconds 1; 2; 3; 4; 5; 6; 7; 8; 10; <b>12</b> ; 15; 20; 25; 30; 35; 40; 60; 90; 120 minutes
This parameter indicates the duration of the shutter movement before the shutter is automatically switched off. It is not displayed if the parameter “Function of louvres (step)” is set to “using shutter up/down with stop telegram”.	
<b>Time for louvres adjustment</b>	50; 80; 100; 120; 140; 160; 180; <b>200</b> ; 220; 240; 260; 280; 300; 360; 400; 500; 700; 800; 1000 milliseconds
This parameter defines the period for louvre adjustment. It is not displayed if the parameter “Function of louvres (step)” is set to “using shutter up/down with stop telegram”.	
<b>Delay time on a direction change</b>	50; 80; 100; 120; 140; 160; 180; <b>200</b> ; 220; 240; 260; 280; 300; 360; 400; 500; 700; 800; 1000 milliseconds
The duration of a reverse step is defined using this parameter. It is not displayed if the parameter “Function of louvres (step)” is set to “using shutter up/down with stop telegram”.	

Parameters	Settings
<b>Pause on change in direction</b>	10 milliseconds 40 milliseconds 70 milliseconds 100 milliseconds 200 milliseconds 400 milliseconds <b>700 milliseconds</b> 1 second 2 seconds 4 seconds
The pause on change in direction is set via this parameter. The shutter remains stationary for the duration of the period. Note: The parameter should be set to the time given by the manufacturer of the shutter (generally longer than 500 ms).	
<b>Shutter control using dim. command</b>	<b>disabled (standard)</b> <b>enabled (Up/Down are changed)</b>
This parameter controls whether a 4-bit object is made available for shutter control. It is therefore possible for a dimming sensor to control a shutter, whereby dimming brighter raises the shutter and dimming darker lowers the shutter. All the dimming telegrams are interpreted as an adjustment by 100% since the actuator does not know the current position. For this reason, it is advisable to configure the dimming sensor only for “Dimming with stop telegram”. If the setting “enabled” is selected, the corresponding object is displayed in the object list. The shutter continues to move for the duration of the push button action.	
<b>Behaviour on bus voltage failure</b>	<b>move shutter up</b> move shutter down STOP
This parameter indicates the behaviour of the shutter on bus voltage failure. In the event of bus voltage failure, the pause on change in direction that is normally observed is not taken into consideration. Note: When operating heavy shutter motors, the setting “STOP” should be selected in order to protect the relay contacts.	
<b>Safety (e.g. wind alarm)</b>	<b>disabled</b> <b>enabled</b>
The safety function is enabled or disabled via this parameter. The parameter must be set to enabled when a wind sensor is being used.	
<b>Safety position of shutter</b>	<b>Up</b>
This parameter indicates the limit position of the shutter in the event of a safety alarm. The parameter only appears if the safety function has been enabled. The safety position cannot be changed.	
<b>Monitoring time</b>	<b>12 minutes</b>
The monitoring time is specified with this parameter. The safety object expects to receive cyclical telegrams (“0” signals). If the shutter actuator does not receive a signal within the monitoring period, the safety function is initiated.	

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## Roller blind

## Communication objects

Phys.Addr.		Program		Type
no.	Object name	Function		
12	01.01.001	20 A1	Actuator-BCU Shutter	902802
12	Roller blinds	Up / Down		1 Bit
13	Roller blinds	STOP		1 Bit
14	Wind alarm	Roller blinds up		1 Bit
15	Roller blinds using dim. command	Up/Down using Brighter/Darker		4 Bit

Obj	Object name	Function	Type	Flag
12	Roller blinds	Up / Down	1 Bit	CW
The movement of the roller blind (Up / Down) is initiated with this object. The blind is raised on receipt of a logic "0" and lowered on receipt of a logic "1".				
13	Roller blinds	STOP	1 Bit	CW
This object serves as a receiving object for stopping the movement of the roller blind.				
14	Wind alarm	Roller blinds up	1 Bit	CW
This object can be linked with a safety address e.g. from a wind sensor. In the idle state, the sensor sends a logic "0" at cyclic intervals. In the event of wind alarm, it sends a logic "1". In this case, the shutter switch moves the roller blind into the set safety position (Up or Down) and blocks the operation of the roller blind. This also happens if the wind sensor fails and is therefore no longer able to send cyclical "0" signals. This object is only available if the parameter "Safety (e.g. wind alarm)" is set to "enabled".				
15	Roller blinds using dim. command	Up/Down using Brighter/Darker	4 Bit	CW
A dimming sensor can control a roller blind via this object, whereby dimming brighter raises the blind and dimming darker lowers the blind. All the dimming telegrams are interpreted as an adjustment by 100%, as the actuator does not know the current position. For this reason, it is advisable to configure the dimming sensor only for "Dimming with stop telegram".				
This object is only available if the parameter "Roller blinds control using dim. command" has been set to "enabled". The object value of the "Roller blinds" object is also inverted. This means that the object for the roller blind that is controlled by a short push button action can be linked with the "Roller blinds" object. The roller blind is thus raised by a short push button action of the upper contact (upper -> brighter; lower -> darker).				

## Parameters

LED	Small buttons left	Large buttons left	Large buttons right	Small buttons right
<b>Roller blinds</b>				
<b>Function</b>		<b>Roller blinds</b>		
<b>Automatically stop roller blinds movement</b>		<b>enabled</b>		
<b>Time for roller blinds movement</b>		<b>12 minutes</b>		
<b>Pause on change in direction</b>		<b>700 milliseconds</b>		
<b>Roller blinds control using dim command</b>		<b>enabled (Up/Down are changed)</b>		
<b>Behaviour on bus voltage failure</b>		<b>move shutter up</b>		
<b>Safety (e.g. wind alarm)</b>		<b>enabled</b>		
<b>Safety position of roller blinds</b>		<b>Up</b>		
<b>Monitoring time</b>		<b>12 minutes</b>		

Parameters	Settings
<b>Function</b>	Shutter <b>Roller blind</b>
The function of the shutter switch is set via this parameter. The parameter window changes depending on the function selected and the relevant parameters are displayed with default settings.	
<b>Automatically stop roller blinds movement</b>	disabled <b>enabled</b>
This parameter indicates whether the relay is automatically opened once the travel time for the roller blinds has elapsed. If "enabled" is selected, the parameter "Time for roller blinds movement" appears for setting the travel time.	
<b>Time for roller blinds movement</b>	10; 30 seconds 1; 2; 3; 4; 5; 6; 7; 8; 10; <b>12</b> ; 15; 20; 25; 30; 35; 40; 60; 90; 120 minutes
This parameter indicates the duration of the roller blind movement before the blind is automatically switched off. It is not displayed if the parameter "Automatically stop roller blinds movement" is set to "disabled".	
<b>Pause on change in direction</b>	10 milliseconds 40 milliseconds 70 milliseconds 100 milliseconds 200 milliseconds 400 milliseconds <b>700 milliseconds</b> 1 second 2 seconds 4 seconds
The pause on change in direction is set via this parameter. The roller blind remains stationary for the duration of the period.	
Note: The parameter should be set to the time <u>given by the manufacturer of the roller blind</u> (generally longer than 500 ms).	

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Parameters	Settings
<b>Roller blinds control using dim. command</b>	disabled (standard) <b>enabled (Up/Down are changed)</b>
This parameter controls whether a 4-bit object is made available for controlling the roller blind. It is therefore possible for a dimming sensor to control a roller blind, whereby dimming brighter raises the blind and dimming darker lowers the blind. All the dimming telegrams are interpreted as an adjustment by 100% since the actuator does not know the current position. For this reason, it is only advisable to configure the dimming sensor for "Dimming with stop telegram". If the setting "enabled" is selected, the corresponding object is also displayed in the object list.	
<b>Behaviour on bus voltage failure</b>	<b>move shutter up</b> move shutter down STOP
This parameter indicates the behaviour of the roller blind on bus voltage failure. Note: When operating heavy roller blind motors, the setting "STOP" should be selected in order to protect the relay contacts.	
<b>Safety (e.g. wind alarm)</b>	disabled <b>enabled</b>
The safety function is enabled or disabled via this parameter. The parameter must be set to enabled when a wind sensor is being used.	
<b>Safety position of roller blinds</b>	Up Down
This parameter indicates the limit position of the roller blind in the event of a safety alarm. The parameter only appears if the safety function has been enabled.	
<b>Monitoring time</b>	<b>12 minutes</b>
The safety object expects to receive cyclical telegrams ("0" signals). If these telegrams fail to appear, the safety function is triggered and the roller blind is moved to the safety position. The monitoring time is specified with this parameter. If the shutter actuator does not receive a signal within the monitoring period, the safety function is initiated.	

**Times**

The times cannot be kept to exactly for reasons associated with the internal operating system. The following tables indicate the time bands that are applied.

**Reversal in change of direction**

Time [ms]	Time from [ms]		Time to [ms]
10	9.5	-	10.0
20	19.5	-	20.0
40	39.5	-	40.0
70	69.5	-	70.0
100	99.5	-	100.0
200	192.0	-	200.0
400	392.0	-	400.0
700	696.0	-	704.0
1.000	992.0	-	1000.0
2.000	1992.0	-	2000.0
4.000	3900.0	-	4030.0

**Louvre adjustment time**

Time [ms]	Time from [ms]	Time to [ms]
50	49.5	- 50.0
60	59.5	- 60.0
70	69.5	- 70.0
80	79.5	- 80.0
100	99.5	- 100.0
120	119.5	- 120.0
140	136.0	- 144.0
160	152.0	- 160.0
180	176.0	- 184.0
200	192.0	- 200.0
220	216.0	- 224.0
240	232.0	- 240.0
260	256.0	- 264.0
280	272.0	- 280.0
300	296.0	- 304.0
330	320.0	- 328.0
360	352.0	- 360.0
400	392.0	- 400.0
500	496.0	- 504.0
600	592.0	- 600.0
700	696.0	- 704.0
800	792.0	- 800.0
1.000	992.0	- 1000.0

## 20 A1 Actuator-BCU Shutter 902802

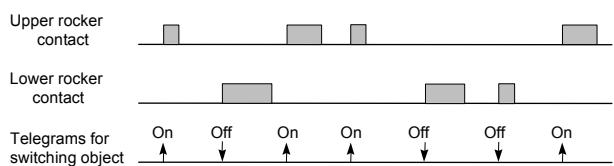
## Travel time for shutters and blinds

Time [min]	Time [ms]	Time [ms]		Time [min]	
		from	- to	from	- to
	10,000	9880.0	- 10010.0	0.2	- 0.2
	30,000	29900.0	- 30030.0	0.5	- 0.5
1	60,000	58800.0	- 60900.0	1.0	- 1.0
2	120,000	117600.0	- 119700.0	2.0	- 2.0
3	180,000	178500.0	- 180600.0	3.0	- 3.0
4	240,000	237300.0	- 239400.0	4.0	- 4.0
5	300,000	298200.0	- 300300.0	5.0	- 5.0
6	360,000	357000.0	- 359100.0	6.0	- 6.0
7	420,000	417900.0	- 420000.0	7.0	- 7.0
8	480,000	478800.0	- 480900.0	8.0	- 8.0
10	600,000	561000.0	- 594000.0	9.4	- 9.9
12	720,000	693000.0	- 726000.0	11.6	- 12.1
15	900,000	858000.0	- 891000.0	14.3	- 14.9
20	1,200,000	1155000.0	- 1188000.0	19.3	- 19.8
25	1,500,000	1452000.0	- 1485000.0	24.2	- 24.8
30	1,800,000	1782000.0	- 1815000.0	29.7	- 30.3
35	2,100,000	2079000.0	- 2112000.0	34.7	- 35.2
40	2,400,000	2376000.0	- 2409000.0	39.6	- 40.2
60	3,600,000	3564000.0	- 3597000.0	59.4	- 60.0
90	5,400,000	5379000.0	- 5412000.0	89.7	- 90.2
120	7,200,000	7161000.0	- 7194000.0	119.4	- 119.9

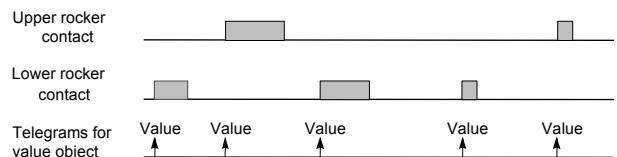
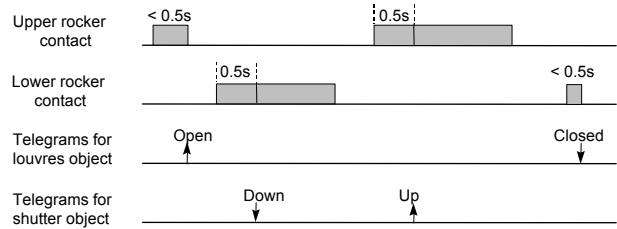
## Safety times

Time [min]	Time [ms]	Time from [ms]	Time to [ms]	Time from [min]	Time to [min]
2	120,000	132000.0	- 165000.0	2.2	- 2.8
4	240,000	264000.0	- 297000.0	4.4	- 5.0
8	480,000	495000.0	- 528000.0	8.3	- 8.8
12	720,000	726000.0	- 759000.0	12.1	- 12.7
20	1,200,000	1221000.0	- 1254000.0	20.4	- 20.9
30	1,800,000	1815000.0	- 1848000.0	30.3	- 30.8
45	2,700,000	2706000.0	- 2739000.0	45.1	- 45.7
60	3,600,000	3630000.0	- 3663000.0	60.5	- 61.1

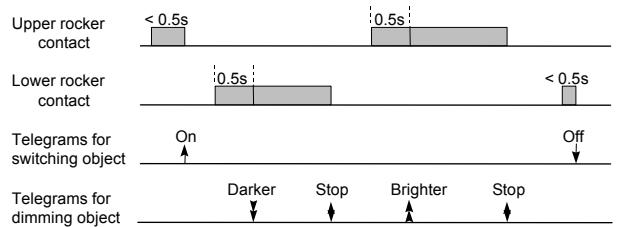
## Timing diagrams: Examples for a rocker

Configured for switch function:  
upper "On", lower "Off"

## Configured for switch function: "8-bit Value"

Configured for shutter:  
upper "Up", lower "Down"

## Configured for dimming with stop telegram



## Configured for dimming with cyclical sending

