20 A1 Actuator-BCU Shutter 902002

Use of the application program

Product family: Shutter
Product type: Switch
Manufacturer: Siemens

Name: Shutter switch UP 520/11
Order no.:   5WG1 520-2AB11

Functional description

The application program "20 A1 Actuator-BCU Shutter 902002" enables the output of the shutter switch to be used to control a shutter, roller blind or skylight.

Shutter, Up/Down (Roller blind)

When the "Up/Down" object receives a telegram, the shutter 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 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 is already travelling in a certain direction and "Up/Down" telegrams are received to move the shutter in the opposite direction, the shutter 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.

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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).

⚠ **WARNING**

When using the shutter switch UP 520/11 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 shutter (generally longer than 500 ms).
- The parameter "Behaviour on bus voltage failure" must be set to "STOP".

Maximum number of group addresses: 12
Maximum number of associations: 12

Note

The view of the communication objects can be arranged individually i.e. this view can vary depending on the parameters selected.

Shutter

Communication objects

	no.	Object name	Function	Type
		Phys.Addr.	Program	
⧉		01.01.007	20 A1 Actuator-BCU Shutter 902002	
◨	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 serves for louvre adjustment. The louvres are rotated downwards on receipt of a logic "0" and rotated upwards on receipt of a logic "1".				
14	Wind alarm	Shutter 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 a wind alarm, it sends a logic "1". In this case, the shutter switch moves the shutter into the safety position and blocks the operation of the shutter. The same 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	Shutter using dimming	Up/Down using Brighter/Darker	4 Bit	CW
A dimming sensor can control a shutter via this object, whereby dimming brighter raises the shutter and dimming darker lowers the shutter. 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 only advisable to configure the dimming sensor for "Dimming with stop telegram". This object is only available if the parameter "Shutter control using dim. command" has been set to "enabled". The object values of "Shutter" and "Louvres" are also inverted. This means that the object for the shutter that is controlled by a short push button action can be linked with the "Louvres" object. The louvres are thus opened by a short push button action of the upper contact (upper -> brighter; lower -> darker).				

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Parameters

Parameters	Settings
Function	**Shutter** Roller blinds
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.	
Function of louvres (step)	**using object, without reverse step after stop** 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 using 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 louvre adjustment command is carried out with a reverse step and the relay is opened once the period for louvre adjustment has elapsed. In this setting, the parameter for setting the delay time is displayed. "using shutter up/down with stop telegram": The louvre adjustment telegram is interpreted as a stop telegram for halting the shutter movement. The automatic opening of the relays is deactivated. In this setting, the louvre object changes and is displayed as a stop object.	
Time for shutter movement	10; 30 seconds 1; 2; 3; 4; 5; 6; 7; 8; 10; **12;** 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".	

Parameters	Settings
Time for louvres adjustment	50; 80; 100; 120; 140; 160; 180; **200;** 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".	
Delay time on a direction change	50; 80; 100; 120; 140; 160; 180; **200;** 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".	
Pause on change in direction	10 milliseconds 40 milliseconds 70 milliseconds 100 milliseconds 200 milliseconds 400 milliseconds **700 milliseconds** 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 this period. Note: The parameter must be set to the time given by the manufacturer (generally longer than 500 ms).	
Shutter control using dim. command	disabled (standard) **enabled (Up/Down are changed)**
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 only advisable to configure the dimming sensor for "Dimming with stop telegram". If the setting "enabled" is selected, the corresponding object is displayed in the object list.	
Behaviour on bus voltage failure	**move shutter up** 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 roller blind motors, the setting "STOP" should be selected in order to protect the relay contacts.	

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Parameters	Settings
Safety (e.g. wind alarm)	disabled **enabled**
The safety function can be disabled or enabled via this parameter. This parameter must be enabled when a wind sensor is being used.	
Safety position of shutter	**Up**
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.	
Monitoring time	**12 minutes**
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.	

Roller blind

Communication objects

Phys.Addr.	Program		
no.	**Object name**	**Function**	**Type**
01.01.007	20 A1 Actuator-BCU Shutter 902002		
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 roller blind into the safety position (Up or Down) and blocks the operation of the roller blind. The same 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".				

Obj	Object name	Function	Type	Flag
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 only advisable to configure the dimming sensor 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

Roller blinds	
Function	Roller blinds
Automatically stop roller blinds movement	enabled
Time for roller blinds movement	12 minutes
Pause on change in direction	700 milliseconds
Roller blinds control using dim. command	disabled (standard)
Behaviour on bus voltage failure	move shutter up
Safety (e.g. wind alarm)	enabled
Safety position of roller blinds	Up
Monitoring time	12 minutes

Parameters	Settings
Function	Shutter **Roller blinds**
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.	
Automatically stop roller blinds movement	disabled **enabled**
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.	
Time for roller blinds movement	10; 30 seconds 1; 2; 3; 4; 5; 6; 7; 8; 10; **12;** 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 "Automatic stop roller blinds movement" is set to "disabled".	

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Parameters	Settings
Pause on change in direction	**700 milliseconds**
The pause on change in direction is set via this parameter. The shutter remains stationary for the duration of this period. Note: The parameter must be set to the time given by the manufacturer (generally longer than 500 ms).	
Roller blinds control using dim. command	disabled (standard) enabled (Up/Down are changed)
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 displayed in the object list.	
Behaviour on bus voltage failure	**move shutter up** 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 "STOP" setting should be used if possible to protect the relay contacts.	
Safety (e.g. wind alarm)	disabled **enabled**
The safety function can be disabled or enabled via this parameter. This parameter must be enabled if a wind sensor is being used.	
Safety position of roller blinds	**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.	
Monitoring time	**12 minutes**
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.	

Time periods

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 direction of movement

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

Time for louvre adjustment

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

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Travel time for shutters and roller blinds

Time [min]	Time [ms]	Time [ms] from	-	to	Time [min] 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

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