20 A2 Actuator-BCU binary 901002

Use of the application program

Product family: Output
Product type: Binary output, 2-fold
Manufacturer: Siemens

Name: Binary output UP 562/11
Order no.:   5WG1 562-2AB11

Functional description

Using the application program "20 A2 Actuator-BCU binary 901002", it is possible to assign parameters to the 2 outputs of the binary output UP 562/11.
Each binary output can be used for pure switch functions, as a time switch (staircase lighting function) and for switching with time delays, logic operations and positive drive. It is also possible to parameterise the behaviour on bus voltage failure and select the type of relay contact.

Functions of the binary outputs

Switching with On/Off delay (normal mode)
If an On delay has been assigned, the On signal is routed with a delay (to the OR function). If a further On signal is received during the On delay, the period is restarted. In the same way, a specified Off delay causes the Off signal to be routed with a delay. The Off delay is restarted if a further Off signal is received during this period. No changes occur however if an Off signal is received during the On delay or an On signal is received during the Off delay as the delay that is currently active is interrupted.
If no time delays have been assigned, then the On/Off signal is routed immediately.

Switching with On/Off delay (time switch)
If an On delay has been assigned, the On signal is routed with a delay. If a further On signal is received during the On delay, the period is restarted. Once the On delay has elapsed, the On signal is routed and the Off delay is started simultaneously. The Off signal is routed once the period specified for the Off delay has elapsed. If a premature Off signal is received during the Off delay, the delay period is interrupted and the Off signal is routed immediately (=switching off prematurely).

OR function
The OR object input and the output of the time function form the two inputs of the OR function. If the OR function is enabled, both the inputs are linked with an OR logic operation and are available at the internal output of the OR function. If the OR function is disabled, the output of the time function is available directly at the internal output of the OR function.

AND function
The AND object input and the output of the OR function form the two inputs of the AND function. If the AND function is enabled, the two inputs are linked with an AND logic operation and are available at the internal output of the AND function. If the AND function is disabled, the output of the OR function is available directly at the internal output of the AND function.

Positive drive
The input of the positive drive object and the output of the AND function form the two inputs of the positive drive. If the positive drive is enabled, the two inputs are linked as follows and are available at the internal output of the positive drive. The positive drive object is a 2-bit object. If bit 1 has the value 0, then the positive drive is regarded as "passive" and the output of the AND function is available directly at the output of the positive drive. This value is simultaneously loaded into bit 0 of the positive drive object so that the status is <u>always</u> contained in bit 0 of this object. If bit 1 of the positive drive object has the value 1, then the positive drive is regarded as "active" and the output of the AND logic operation has no function. In this case, bit 0 of the positive drive object determines the value of the internal output of the positive drive. If the positive drive is disabled, the output of the AND function is available directly at the internal output of the positive drive.

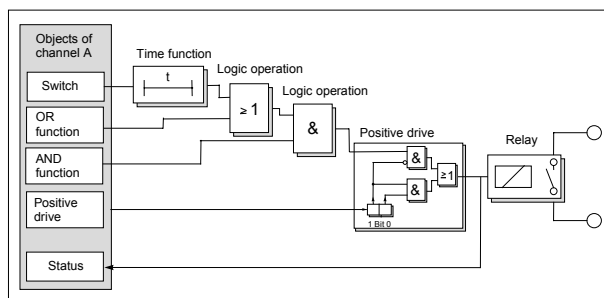| Bit 1	Bit 0	Function
0	0	Disabled positive drive
0	1	Disabled positive drive
1	0	Switch off with positive drive
1	1	Switch on with positive drive

Status object
After each switching operation, the status object is updated accordingly and automatically sent. It is possible to disable the automatic sending of the object via parameters so that the relay state is only achieved by scanning this object specifically.

Bus voltage failure / bus voltage recovery
The program always stores all the object values on bus voltage failure. It is also possible to assign a switching operation to the relay. On bus voltage recovery, these object values are read back first of all. They are then modified according to the parameters selected. The relay state is then produced from the object values and the corresponding system configuration (logic operations....).

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Block diagram of a channel

Maximum number of group addresses: 38
Maximum number of associations: 38

Note:

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

Assigning parameters to the binary outputs

Communication objects

Phys.Addr.		Program		
	no.	Object name	Function	Type
01.01.007		20 A2 Actuator-BCU Binary 901002		
	12	Switch, Channel A	On / Off	1 Bit
	13	Switch, Channel B	On / Off	1 Bit
	14	Status, Channel A	On / Off	1 Bit
	15	Status, Channel B	On / Off	1 Bit
	16	Logic operation, Channel A	OR function	1 Bit
	17	Logic operation, Channel B	OR function	1 Bit
	18	Logic operation, Channel A	AND function	1 Bit
	19	Logic operation, Channel B	AND function	1 Bit
	20	Positive drive, Channel A	On / Off	2 Bit
	21	Positive drive, Channel B	On / Off	2 Bit

Obj	Object name	Function	Type	Flag
12	Switch, Channel A	On / Off	1 Bit	CW
13	Switch, Channel B	On / Off	1 Bit	CW
The switching telegrams that are relayed via the time function to relay channel A or B are received via the group addresses in these objects.				
14	On / Off	Status, Channel A	1 Bit	CRT

Obj	Object name	Function	Type	Flag
15	Status, Channel B	On / Off	1 Bit	CRT
The current switching states of the relay channels are stored in this object. The object value is dependent on the switching telegrams to switching object 12 or 13 as well as on the state of the objects for logic operation and positive drive. The parameter settings "normally open contact" and "normally closed contact" for the relay mode do not influence the object value. No telegrams are sent if there is a change in the object value. The switching state can be read out via the ETS program or a visualisation terminal.				
16	Logic operation, Channel A	OR function	1 Bit	CRW
17	Logic operation, Channel B	OR function	1 Bit	CRW
18	Logic operation, Channel A	AND function	1 Bit	CRW
19	Logic operation, Channel B	AND function	1 Bit	CRW
The switching information for the logic operation inputs of channel A or B is received via the group addresses in these objects. If "no logic operation" is selected in the relevant parameters, these objects have no function.				
20	Positive drive, Channel A	On / Off	2 Bit	CRW
21	Positive drive, Channel B	On / Off	2 Bit	CRW
The switching telegrams for the positive drive of relay channels A and B are received via the group addresses in these objects. The positive drive is not active for the object values "0" and "1". The switching state is assigned by the internal output of the AND function. Object value "2" switches off with positive drive while object value "3" switches on with positive drive. This overrides the state that was set by the output. Disabling the positive drive via a telegram with the value "0" or "1" causes the relay to be operated in the state that was defined by the output.				

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Normal mode: Parameters

Relay A

The function and parameters of channels A and B are identical.

Parameters	Settings
Channel A	**enabled** disabled
The corresponding channel is disabled (not used) or enabled via this parameter. If "disabled" is selected, the following parameters are no longer displayed.	
Operating mode	**Normal mode** Time switch
The function of the channel is set via this parameter. The parameter window "Relay A" changes depending on the function that is selected here and the relevant parameters are displayed with default settings.	
Relay mode	**normally open contact** normally closed contact

This parameter defines the behaviour of the relay contact.
"normally open contact":
      Off telegram = contact open,
      On telegram = contact closed.
"normally closed contact":
      Off telegram = contact closed,
      On telegram = contact open.	

On / Off delay	**enabled** disabled
The On/Off delay can be disabled (not used) or enabled via this parameter. If "disabled" is selected, the parameters that are used for setting the time delays are no longer displayed.	

Parameters	Settings
Base for Off delay	**Time base 130 ms** Time base 260 ms Time base 520 ms Time base 1 sec Time base 2.1 sec Time base 4.2 sec Time base 8.4 sec Time base 17 sec Time base 34 sec Time base 1.1 min Time base 2.2 min Time base 4.5 min Time base 9 min Time base 18 min Time base 35 min Time base 1.2 hr
Factor for Off delay (5-127)	**5**
The time for the "Off delay" is set here. This is calculated from the selected base multiplied by the factor that is entered here. Note: An attempt should always be made to set the required time with the smallest possible base as the base that is selected here also simultaneously specifies the maximum timing error.	
Base for On delay	**Time base 130 ms** Time base 260 ms Time base 520 ms Time base 1 sec Time base 2.1 sec Time base 4.2 sec Time base 8.4 sec Time base 17 sec Time base 34 sec Time base 1.1 min Time base 2.2 min Time base 4.5 min Time base 9 min Time base 18 min Time base 35 min Time base 1.2 hr
Factor for On delay (5-127)	**5**
The time for the "On delay" is set here. This is calculated from the selected base multiplied by the factor that is entered here. Note: An attempt should always be made to set the required time with the smallest possible base as the base that is selected here also simultaneously specifies the maximum timing error.	
OR function (Prio. 3)	**no logic operation** OR function
This parameter defines whether a logic operation should be carried out with the OR function object at the output of the time function.	
Logic operation AND (priority 2)	**no logic operation** AND function
This parameter defines whether a logic operation should be carried out with the AND function object at the output of the OR function.	

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Relay A-2

Parameters	Settings
Positive drive (priority 1)	**no positive drive** Positive drive
Using this parameter, channel A can be controlled via a positive drive object. The positive drive input and the output of the AND function form the two inputs of the positive drive. If the positive drive is enabled, the two inputs are linked and are available at the internal output of the positive drive.	
Behaviour on bus voltage failure	no action **contact opens** contact closes
The behaviour of the relay contact on bus voltage failure can be set here. "no action": The relay contact maintains its current switching state on bus voltage failure. "contact closes": The relay contact is closed on bus voltage failure. This reaction is not dependent on the relay mode that has been selected (normally open or normally closed contact). "contact opens": The relay contact is opened on bus voltage failure. This reaction is not dependent on the relay mode that has been selected (normally open or normally closed contact).	
Initialisation value for switch/OR/AND/positive drive object	**0 / 0 / 0 / 00** 1 / 1 / 1 / 00 1 / 0 / 1 / 00 1 / 0 / 1 / 10 1 / 0 / 1 / 11 1 / 0 / 0 / 00 0 / 1 / 1 / 00 0 / 0 / 1 / 10 0 / 0 / 1 / 11 as before bus voltage failure
This parameter specifies the initialisation values of the objects. The first value (on the left) corresponds to the object value for switching, the second is the object value for the OR function, the third is for the AND function and the final value corresponds to the object value for positive drive.	
Status	**transmit on change of object value** using read request
This parameter defines the behaviour of the status object. (It controls the "transmission flag" of the object parameters). "transmit on change of object value": If the object value has changed, a corresponding telegram is sent. "using read request": The status object only sends the status after a read request.	

Note

If the parameter "On / Off delay" is set to "disabled" while in normal mode, the parameters of parameter window "Relay A-2" are displayed instead in parameter window "Relay A" where they can be set as required. The parameter window "Relay A-2" is not displayed in this case.

Time switch: Parameters

Relay A

The function and parameters of channels A and B are identical.

Parameters	Settings
Channel A	**enabled** disabled
The corresponding channel is disabled (not used) or enabled via this parameter. If "disabled" is selected, the following parameters are no longer displayed.	
Operating mode	Normal mode **Time switch**
The function of the channel is set via this parameter. The parameter window "Relay A" changes depending on the function that is selected here and the relevant parameters are displayed with default settings.	
Relay mode	**normally open contact** normally closed contact

This parameter defines the behaviour of the relay contact.
"normally open contact":
       Off telegram = contact open,
       On telegram = contact closed.
"normally closed contact":
       Off telegram = contact closed,
       On telegram = contact open.	

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Parameters	Settings
Base for Off delay	**Time base 130 ms** Time base 260 ms Time base 520 ms Time base 1 sec Time base 2.1 sec Time base 4.2 sec Time base 8.4 sec Time base 17 sec Time base 34 sec Time base 1.1 min Time base 2.2 min Time base 4.5 min Time base 9 min Time base 18 min Time base 35 min Time base 1.2 hr
Factor for Off delay (5-127)	**5**
The time for the "Off delay" is set here. This is calculated from the selected base multiplied by the factor that is entered here. Note: An attempt should always be made to set the required time with the smallest possible base as the base that is selected here also simultaneously specifies the maximum timing error.	
Base for On delay	**Time base 130 ms** Time base 260 ms Time base 520 ms Time base 1 sec Time base 2.1 sec Time base 4.2 sec Time base 8.4 sec Time base 17 sec Time base 34 sec Time base 1.1 min Time base 2.2 min Time base 4.5 min Time base 9 min Time base 18 min Time base 35 min Time base 1.2 hr
Factor for On delay (0-127)	**0**
The time for the "On delay" is set here. This is calculated from the selected base multiplied by the factor that is entered here. Note: An attempt should always be made to set the required time with the smallest possible base as the base that is selected here also simultaneously specifies the maximum timing error.	
OR function (Prio. 3)	**no logic operation** OR function
This parameter defines whether a logic operation should be carried out with the OR function object at the output of the time function.	

Parameters	Settings
Logic operation AND (priority 2)	**no logic operation** AND function
This parameter defines whether a logic operation should be carried out with the AND function object at the output of the OR function.	
Positive drive (priority 1)	**no positive drive** Positive drive
Using this parameter, channel A can be controlled via a positive drive object. The positive drive input and the output of the AND function form the two inputs of the positive drive. If the positive drive is enabled, the two inputs are linked and are available at the internal output of the positive drive.	

Relay A-2

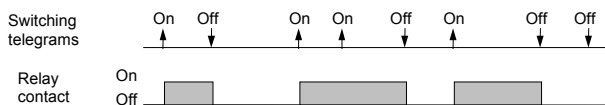| Parameters	Settings
Behaviour on bus voltage failure	no action **contact opens** contact closes
The behaviour of the relay contact on bus voltage failure can be set here. "no action": The relay contact maintains its current switching state on bus voltage failure. "contact closes": The relay contact is closed on bus voltage failure. This reaction is not dependent on the relay mode that has been selected (normally open or normally closed contact). "contact opens": The relay contact is opened on bus voltage failure. This reaction is not dependent on the relay mode that has been selected (normally open or normally closed contact).	
Initialisation value for switch/AND/OR/positive drive object	**0 / 0 / 0 / 00** 1 / 1 / 1 / 00 1 / 0 / 1 / 00 1 / 0 / 1 / 10 1 / 0 / 1 / 11 1 / 0 / 0 / 00 0 / 1 / 1 / 00 0 / 0 / 1 / 10 0 / 0 / 1 / 11 as before bus voltage failure
This parameter specifies the initialisation values of the objects. The first value (on the left) corresponds to the object value for switching, the second is the object value for the OR function, the third is for the AND function and the final value corresponds to the object value for positive drive.	

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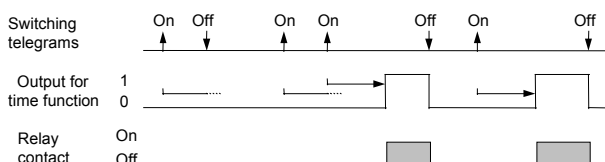| Parameters	Settings
Status	**transmit on change of object value** using read request
This parameter defines the behaviour of the status object. (It controls the "transmission flag" of the object parameters). "transmit on change of object value": If the object value has changed, a corresponding telegram is sent. "using read request": The status object only sends the status after a read request.	

The function and parameters of relay B are identical to those of relay A.

Timing diagrams: Examples for a channel

1. Switching without time delays, logic operation or positive drive

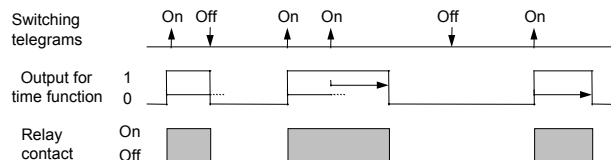### 2. Switching with On delay, without logic operation

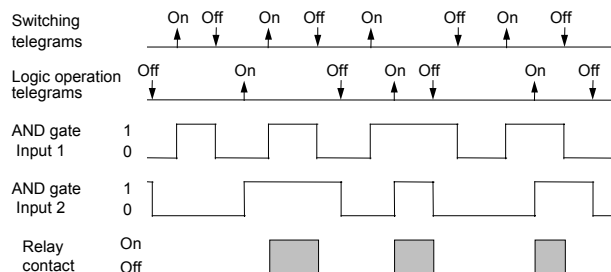### 3. Switching with Off delay, without logic operation

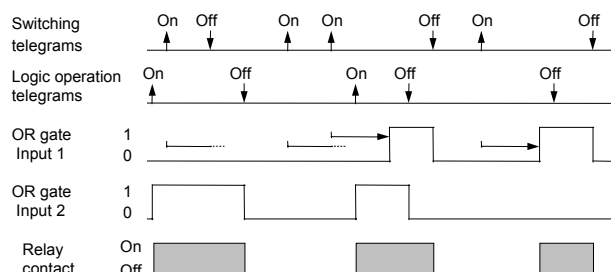### 4. Switching with On and Off delay, without logic operation

5. Switching with time switch function, without logic operation

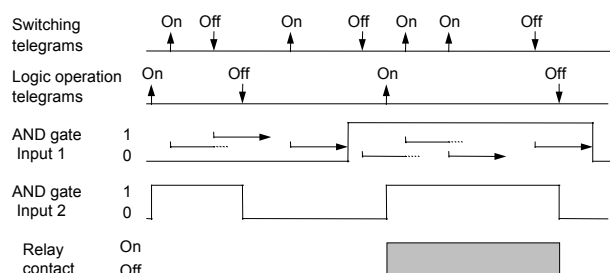
6. Switching with AND function, without time delays

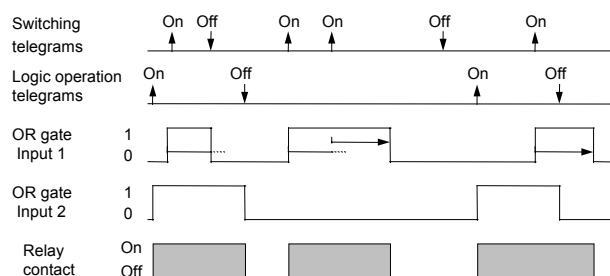### 7. Switching with OR function and On delay

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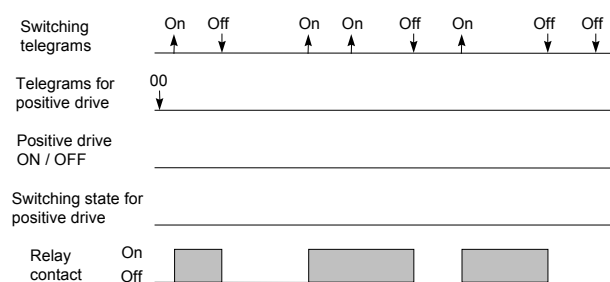
20 A2 Actuator-BCU binary 901002
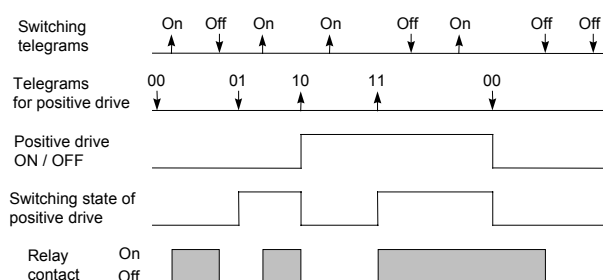
8. Switching with AND function, with On and Off delay

9. Switching with OR function and time switch function

10. Switching without positive drive

11. Switching with positive drive

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Notes: