20 A2 Actuator-BCU Motion detector 913001

Use of the application program

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

Name: Binary output UP 562/01
Catalogue no.: 5WG1 562-2AB01

Functional description

The application program "20 A2 Actuator-BCU Motion detector 913001" enables motions sensed by a motion detector of the UP 255, UP 256, UP 257 or UP 258H type plugged into the peripheral external interface (PEI) of a flush-mounted UP 562/01 actuator both to send via the bus and to control one (or both) of the actuator outputs.
Each actuator output can be set for a pure switching function, timer operation (stairway automatic cut out), relay mode (NO contact, NC contact), switching with delays, logic operation and forced control. In addition a cyclic transmission and the behaviour at bus voltage failure can be configured.

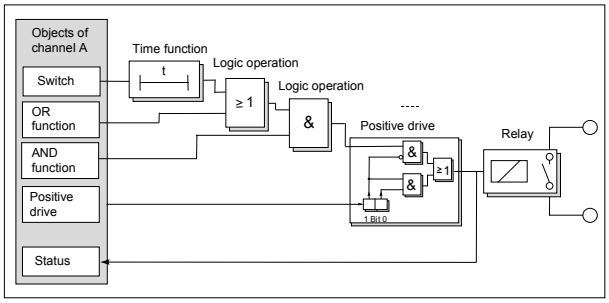
Function of the motion sensor

The motion sensor works in stand-alone mode, records motions in its surroundings and sends appropriate switching telegrams via the bus.
After sensing a motion, an ON telegram is sent. If for at least 10 seconds, motion is no longer sensed in the sensor's detection area, then an OFF telegram is sent (this almost equals a minimum overtravel time of 10 seconds).
The time prior to sending the OFF telegram can be extended using the ETS parameter "Overtravel Time" (default value 0 seconds). When detecting a new motion, a started overtravel time is re-triggered, i.e. the set overtravel time is re-started after the end of the motion. The ON telegram is also re-sent in this case.
With longer-lasting motions or within the overtravel time, ON telegrams can be sent repeatedly using the "Cyclical sending at motion detection" parameter with a configurable cycle time (minimum value 10 seconds).
After triggering the OUT telegram at the end of the delay time, the sensor can be disabled for a configurable dead time (default value 3 seconds).
Cyclic sending ceases after the minimum delay time (10 seconds) has elapsed.

An adjustable brightness level enables that the sensor records the beginning of motions only below this environmental brightness level and sends ON telegrams.
You use a separate object to block the sensing mode. After finishing the blocking mode, the sensor is immediately capable of sensing; no dead time is started.
After bus voltage recovery, the sensor is blocked for a period of 80 seconds, since during this time the amplifier stage of the motion sensor must adjust itself to a defined initial state.

Functions of the binary outputs

Block diagram of a channel



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 delay 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 delay 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 signal is routed immediately (=switching off prematurely).

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

Bit 1	Bit 0	Function
0	0	Disabled positive guide
0	1	Disabled positive guide
1	0	Switch off with positive guide
1	1	Switch on with positive guide

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.

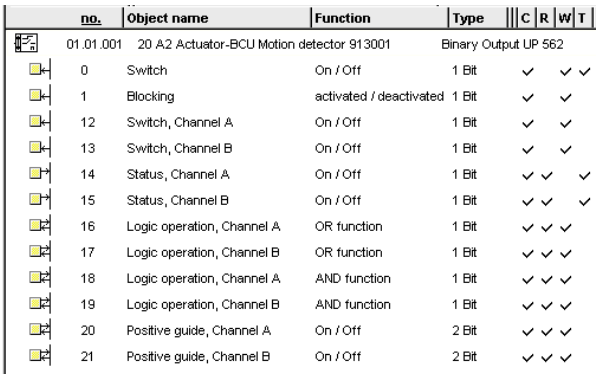
Bus voltage failure / bus voltage recovery
The program always stores all the object values on bus voltage failure. It is also possible to assign a switching operation to the relay. On bus voltage recovery, these object values are read back first of all. They are then modified according to the parameters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

Communication objects

Maximum number of group addresses: 38
Maximum number of assignments: 38

Note:

The view of the communication objects can be arranged individually, i.e. the view can vary according to the configuration.



no.	Object name	Function	Type	C	R	W	T
01.01.001	20 A2 Actuator-BCU Motion detector 913001		Binary Output UP 562				
0	Switch	On / Off	1 Bit	✓		✓	✓
1	Blocking	activated / deactivated	1 Bit	✓		✓	
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 guide, Channel A	On / Off	2 Bit	✓	✓	✓	
21	Positive guide, Channel B	On / Off	2 Bit	✓	✓	✓	

Maximum available number of communication objects

Obj	Object name	Function	Type	Flags
0	Switch	On / Off	1 Bit	CWT
This object sends the motion sensor's switching telegrams. f the motion sensors switch one of the actuator outputs, then this object must be linked via the same group address with object 12 or 13.				

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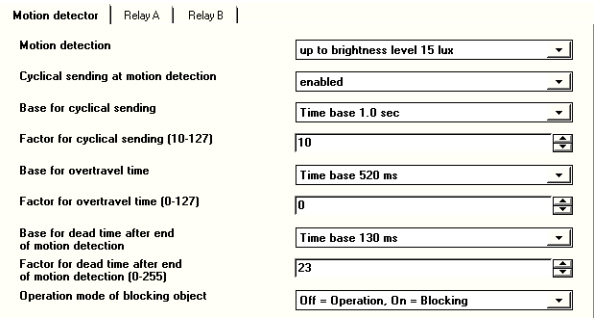
Obj	Object name	Function	Type	Flags
1	Blocking	activated / deactivated	1 Bit	CW
This object is used to block the motion sensing and reporting. Depending upon the configuration, an external bus telegram deactivates or activates motion sensing and the sending of telegrams via the switch object. **Note**: If the parameter setting "On = Operation, Off = Blocking" is enabled, blocking is enabled after bus voltage recovery, since the object value after a reset of the bus coupling equals "Off".				
12	Switch, Channel A	On / Off	1 Bit	CW
13	Switch, Channel B	On / Off	1 Bit	CW
The switching telegrams which are forwarded via the time function to the OR link of channel A or B are received via the group addresses to these objects.				
14	Status, Channel A	On / Off	1 Bit	CRT
15	Status, Channel B	On / Off	1 Bit	CRT
The current switching states of the relay channels are stored in these objects. The object value is dependent on the switching telegrams to switch object 12 or 13 as well as on the state of the objects for logic operation and positive guide. The parameter settings “normally open contact” and “normally closed contact” for the relay mode do not influence the object value. No telegram is sent if there is a change in the object value. The switching state can be read out via the ETS or a visualization 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 to these objects. If “no logic operation” is selected in the relevant parameters, these objects have no function.				

Obj	Object name	Function	Type	Flags
20	Positive guide, Channel A	On / Off	2 Bits	CRT
21	Positive guide, Channel B	On / Off	2 Bits	CRT
The switching telegrams for the positive guide (forced control) of relay channels A and B are received via the group addresses to these objects. The positive guide 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 guide while object value “3” switches on with positive guide. This overrides the state that was set by the output. Disabling the positive guide via a telegram with the value “0” or “1” causes the relay to be operated in the state that was defined by the output.				

Parameters

Parameter window “Motion detector”



Parameter	Settings
Motion detection	disabled up to brightness level 1 lux up to brightness level 2 lux up to brightness level 5 lux up to brightness level 10 lux up to brightness level **15 lux** up to brightness level 20 lux up to brightness level 50 lux up to brightness level 100 lux up to brightness level 200 lux up to brightness level 500 lux up to brightness level 1000 lux Brightness independent
This parameter controls the message of a motion dependent on the ambient brightness. "disabled" no motion message occurs. "up to brightness level ... lux": a motion is reported only if the ambient brightness is below the value set here. "Brightness independent": a sensed motion is reported regardless of the ambient brightness.	

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Parameter	Settings
Cyclical sending at motion detection	**enabled** disabled
This parameter controls the cyclical sending of the switching object No. 0 during the phase of detected motions. "disabled": No cyclical sending occurs. "enabled": The value of the switching object is sent cyclically on the bus with the cycle time configured. Note: After the set overtravel time has elapsed, no cyclical sending occurs.	
Base for cyclical sending	**Time base 1.0 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 36 min Time base 1.2 hrs.
Factor for cyclical sending (10-127)	**10**
These parameters set the time after which the switching object with its current status respectively is sent on the bus. The resulting cycle time results from the time base multiplied by the factor set here.	
Base for overtravel time	Time base 130ms Time base 260ms **Time base 520ms** Time base 1.0 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 36 min Time base 1.2 hrs.
Factor for overtravel time (0-127)	**0**
These parameters set the time after which, starting from the end of the minimum overtravel time, an OFF telegram is sent via the switching object on the bus. The resulting overtravel time is the minimum overtravel time of 10 seconds **plus** the time set here (from the time base multiplied by the factor set here).	

Parameter	Settings
Base for dead time after end of motion detection	Time base 0.5 ms Time base 8 ms **Time base 130 ms** Time base 2.1 seconds Time base 33 seconds
Factor for dead time after end of motion detection (0-255)	**23**
With these parameters the dead time is set after sending an OFF telegram, and motion detection can take place again only after this dead time has elapsed. This can be necessary to prevent erroneous messages, e.g. due to the cooling down of strong sources of light in the sensing area, which would already cause a sufficiently large heat change for motion detection. The dead time results from the time base multiplied by the factor set here.	
Operation mode of blocking object	**Off = operation, On = blocking;** On = operation, Off = blocking
This parameter specifies the function of the telegram values of the blocking object No. 1: "Off = operation, On = blocking": The sent value "Off" enables reporting; the sent value "On" enables blocking. "ON = operation, Off = blocking": The sent value "On" enables reporting; the sent value "Off" enables blocking. Note: With this configuration, blocking is enabled after bus voltage recovery, since the object value is equal to "Off" after a reset of the bus coupling.	

Note:

The actual times can for technical reasons be up to 25% greater than those set here.

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Parameter window „Relay A"

Note:

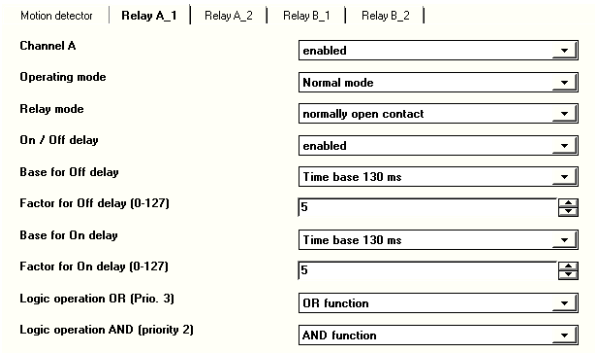
The function and parameters of channels A and B are identical. Therefore only channel A is described here.

Normal mode, Parameters

Note:

If in "Normal mode" operation the parameter "On / Off delay" in the "Relay A" parameter window is set to "disabled", the parameters of the "Relay A_2" parameter window are displayed by the ETS2 in the "Relay A" parameter window and can be set there. The "Relay A_2" parameter window is not displayed in this case.

Relay A_1



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 behavior 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.	

Parameters	Settings
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.	
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 (0-127)	**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)	**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.	
Logic operation OR (Prio. 3)	**no logic operation** OR function
This parameter defines whether a logic operation of the output of the time function should be carried out with the OR function object.	

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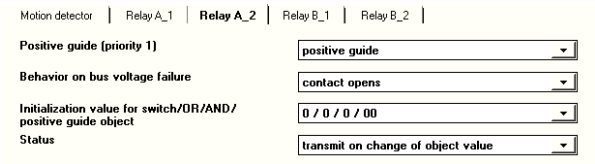
Parameters	Settings
Logic operation AND (priority 2)	**no logic operation** AND function
This parameter defines whether a logic operation of the output of the OR function should be carried out with the AND function object.	

Relay A_2

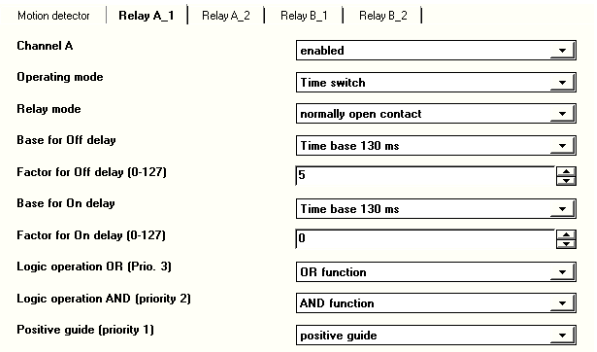


Parameters	Settings
Positive guide (priority 1)	**no positive guide** positive guide
Using this parameter, channel A can be controlled via a positive guide object (forced control). The positive guide input and the output of the AND function form the two inputs of the positive guide. If the positive guide is enabled, the two inputs are linked and are available at the internal output of the positive guide.	
Behavior on bus voltage failure	no action **contact opens** contact closes
The behavior of the relay contact on bus voltage failure can be set here. This reaction is not dependent on the relay mode that has been selected (normally open or normally closed contact). "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).	
Initialization value for switch/OR/AND/positive guide 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 initialization 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 guide.	

Parameters	Settings
Status	**transmit on change of object value;** using read request
This parameter defines the behavior 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 is only sent after a read request.	

Time switch mode: Parameters

Relay A_1



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 behavior 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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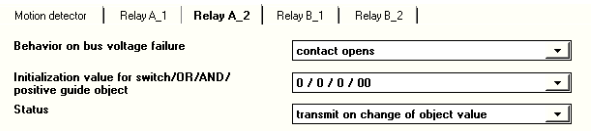
Parameters	Settings
Base for Off delay	**Time base 130 ms** Time base 260 ms Time base 520 ms Time base 1 sec Time base 2.1 sec Time base 4.2 sec Time base 8.4 sec Time base 17 sec Time base 34 sec Time base 1.1 min Time base 2.2 min Time base 4.5 min Time base 9 min Time base 18 min Time base 35 min Time base 1.2 hr
Factor for Off delay (0-127)	**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.	
Logic operation OR (Prio. 3)	**no logic operation** OR function
This parameter defines whether a logic operation of the output of the time function should be carried out with the OR function object.	
Logic operation AND (priority 2)	**no logic operation** AND function
This parameter defines whether a logic operation of the output of the OR function should be carried out with the AND function object.	

Parameter	Einstellungen
Positive guide (priority 1)	**no positive guide** positive guide
Using this parameter, channel A can be controlled via a positive guide object (forced control). The positive guide input and the output of the AND function form the two inputs of the positive guide. If the positive guide is enabled, the two inputs are linked and are available at the internal output of the positive guide.	

Relay A_2



Parameter	Einstellungen
Behavior on bus voltage failure	no action **contact opens** contact closes
The behavior of the relay contact on bus voltage failure can be set here. This reaction is not dependent on the relay mode that has been selected (normally open or normally closed contact). "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).	
Initialization value for switch/OR/AND/positive guide 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 initialization 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 guide.	

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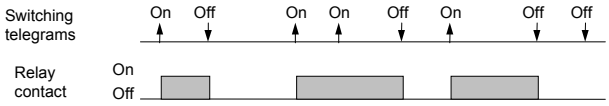
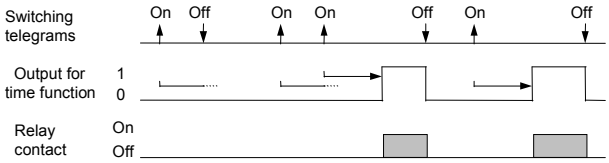
Parameter	Einstellungen
Status	**transmit on change of object value;** using read request
This parameter defines the behavior of the status object. (It controls the "transmission flag" of the object parameters). "transmit on change of object value": If the object value has changed, a corresponding telegram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

Timing diagrams: Examples for a channel

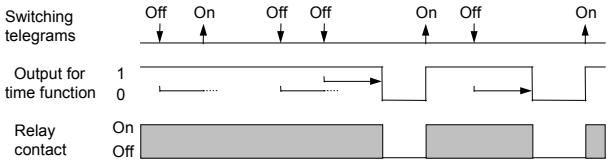
1. Switching without time delays, logic operation or positive guide



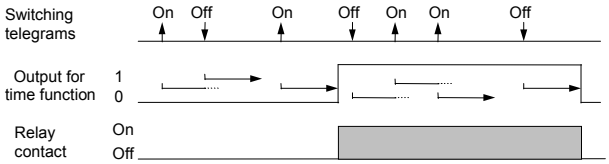
2. Switching with On delay, without logic operation or positive guide



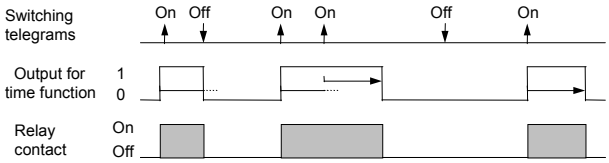
3. Switching with Off delay, without logic operation or positive guide



4. Switching with On and Off delay, without logic operation or positive guide



5. Switching with time switch function, without logic operation or positive guide



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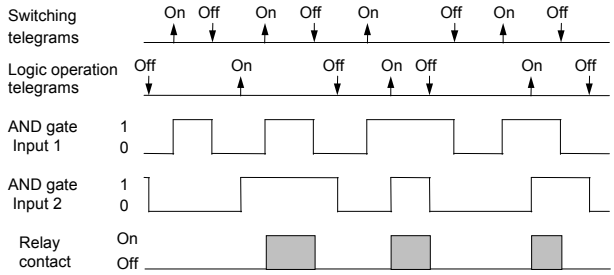
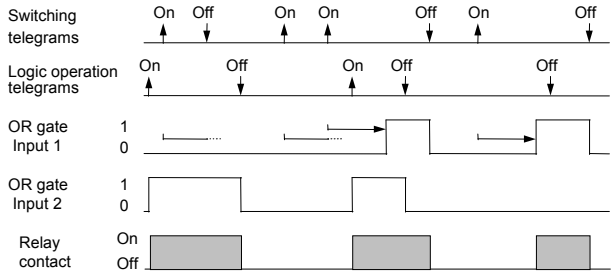
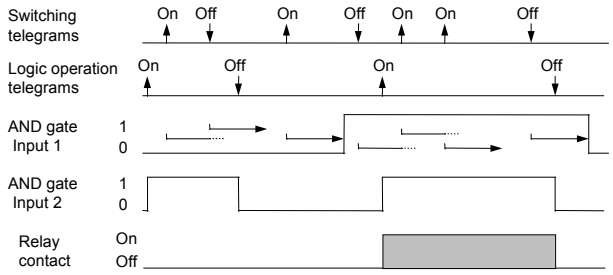
6. Switching with AND function, without time delays or positive guide



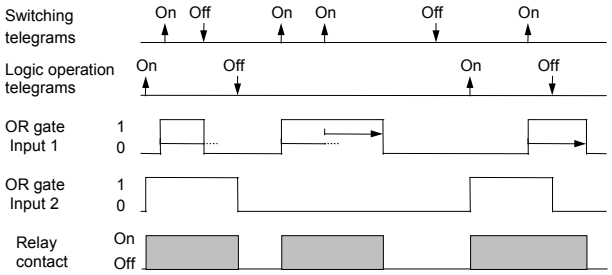
7. Switching with OR function and On delay, without positive guide



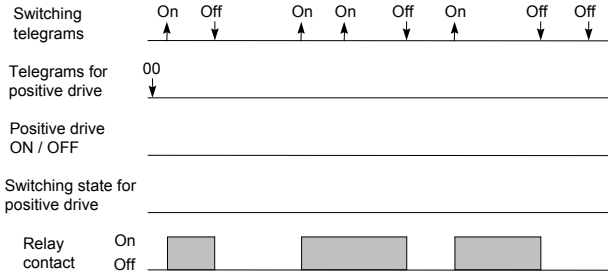
8. Switching with AND function and On and Off delay, without positive guide



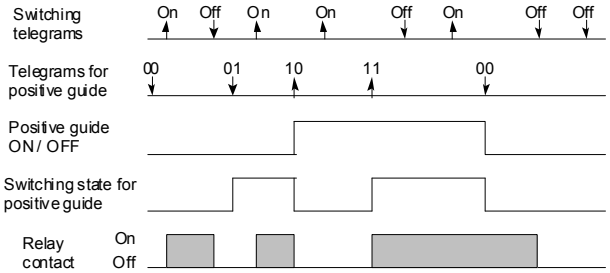
9. Switching with OR function and time switch function, without positive guide



10. Switching without positive guide



11. Switching with positive guide



GAMMA *instabus*

Application Program Description

April 2009

20 A2 Actuator-BCU Motion detector 913001

Space for notices

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