

07B0 A15 Switching actuator 981B01

Use of the application program

Product family: Output
 Product type: Binary
 Manufacturer: Siemens

Name: N 512/11 Switching actuator,
 main module
 Order no.: 5WG1 512-1AB11

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1. Functional description

The N 512/11 switching actuator is a 3 MU (module units) wide device for DIN-rail mounting with N-system dimensions and 3 switching outputs (relay contacts for 230/400V AC, 16A, C-load, in each case with load current measuring and monitoring (load check).

Up to 4 N 512/21 submodules (expansion modules) can be connected in series to a N 512/11 main module with a special jumper. This facilitates expansion of the switching actuator from 3 to a maximum of 15 switching outputs and accordingly matching it flexibly to the number of loads to be switched.

The electronics of the N 512/11 and of all N 512/21 submodules connected to a N 512/11 are powered via the bus. The bus is connected to the main module exclusively via a bus connection block.

Bus mode / direct mode

5 green light-emitting diodes (LEDs) on the top of the main module (see figure 1, A5) indicate which module has been selected (LED = ON). To select a module, you tap the "Direct mode" button (see figure 1, A6) repetitively until the LED for the wanted module A...E lights up. If any of the LEDs A...E flash, then a fault is detected for this module. For example, this is the case if more modules are set than are actually connected or if the set module type does not correspond with the module actually connected or if a module was detected as faulty.

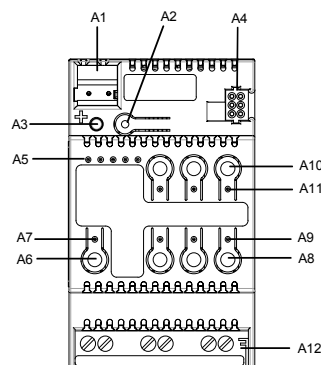


Figure 1: Indication and control elements

You switch between bus and direct mode with the direct mode button (see figure 1, A6) with an integrated yellow LED (see figure 1, A7). If this button is tapped, then which of the modules A to E (see figure 1, A5) was selected last is indicated for 30 seconds as well as the switching state of the relevant outputs by the red LEDs integrated in the buttons 1 to 3 (see figure 1, A9; contact closed: LED = ON, contact open: LED = OFF).

However, if the button to switch on direct mode is held down for at least 3 seconds, then the yellow LED to indicate direct mode comes on permanently. In direct mode, each output of the currently selected module can be switched via the allocated button on the top of the main module through a toggling function: a first press on a button switches on an output if it is switched off, a second press switches it off again. The switching state of the output is indicated by the red LED incorporated in the

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button. (Note: Buttons 4 to 6 and the incorporated LEDs are not used in the N 512/11.)

To change the switching state of the outputs of another module, this must be selected first. To do this, you must tap the direct mode button several times until the LED of the desired module A to E illuminates. You cannot select modules which are not configured as connected.

You use a parameter to set whether direct mode can be switched on permanently or for a given period of time. Direct mode is set in the factory to a time-limited on-time of 15 minutes. The timer limiting the on-time is restarted with the configured on-time each time the button is pressed. After the on-time has elapsed without a further key press, direct mode is switched off automatically and bus mode is re-enabled accordingly (if communication via the bus is possible). Alternatively, direct mode can be ended at any time by pressing the direct mode button for at least 3 seconds. The yellow LED for indicating direct mode then goes out and the actuator is again in bus mode. In bus mode, pressing the button for direct switching of an output off or on does not work. If direct mode is switched on via the bus, received switching and scene-recall commands are buffered and automatically rerun (i.e. executed) after switching back to bus mode.

Behavior on power failure / recovery

Because the actuator electronics are powered via the bus, a mains power failure leads only to functional failure of the actuator if the bus voltage also fails as a consequence of the mains power failure. However, the parameters for the switching state of each actuator output on bus voltage failure and after bus voltage recovery can be set individually: as before bus voltage failure, ON or OFF.

Application program

The N 512/11 switching actuator needs the application program "07B0 A15 Switching actuator 981B01". This controls the outputs both from the main module and all connected extensions.

In bus mode, for each actuator output a communication object can be available for switching, for manual override, for forced control, for a logic operation and for status request. Furthermore, if required, time-limited switching (e.g. for lighting while cleaning) instead of lights permanently on can be enabled for each output via an optional "Night mode" object, if need be with a warning before switching off by multiple switching the output on and off (flashing). You can also select whether all outputs of a module are to be configured jointly and thus identically or whether each output is to be configured separately and individually.

Amongst others, the application program includes optional measuring and monitoring of the load current for each output on load failure and/or overload, simultaneous switching of all 3 outputs (3-phase switching), converting a speed preset as a percentage into 1- to 3-stage

switching commands (fan speed control), conversion of a valve position preset as a percentage into a pulse width modulated (PWM) switching command (thermal drive control), a switching cycle and operating hours count with threshold monitoring for each output and an integrated 8-bit scene control, in which each output can be incorporated into up to 8 scenes.

Engineering Tool Software (ETS), version 3.0 f or higher, is needed to load the application program.

Note: If the N 512/11 application program is "unloaded" with the ETS, then you will no longer be able to enable direct mode, i.e. the LED status display and local switching of the outputs using the buttons on the front panel of the actuator are disabled. Only after reloading the application program can you re-enable the status display and direct mode.

"Device overview" parameter window

This parameter window indicates and sets the number and type of connected submodules. Ex works, the parameter "Number of connected submodules" in the N 512/11 is set to "4". This ensures that every output of connected submodules can be switched locally in direct mode, even via a main module which has not yet been configured. For all unconnected submodules, the corresponding green LED on the front panel of the N 512/11 for indicating the selected device (see figure 1, A5) flashes to signal that the number configured is not the same as the actual number of connected submodules.

"Common functions" parameter window

You use this parameter window to set together for all modules and all outputs the direct mode on-time and the transmission blocking period for status objects. This also determines whether and when status and limit value objects are to be sent and whether the integrated 8-bit scene control is to be enabled.

"X: Presettings" parameter window

You can select this parameter window (X means the module designation A...E) for each module (main module A and configured submodules B...E) respectively.

Use this parameter window to allocate the wanted function to the outputs of the relevant module. Use the "Special function" parameter to set whether none or any of the following special functions is/are wanted:

- Configure all outputs identically
- 3-phase switching
- Fan speed control 1-stage
- Fan speed control 2-stage
- Fan speed control 3-stage.

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If you do not want any special function, then you can set one of the following modes for each output:

- Normal mode
- Timer mode
- Thermal drive control mode.

Figure 2 shows a block diagram of how an output is controlled in "Normal mode".

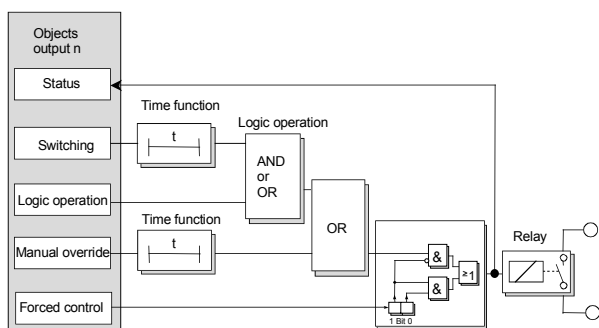


Figure 2: Block diagram of an output in normal mode

"X-n: Behavior normal mode" parameter window

The header (or name) of this window contains the corresponding module designation ($X = A...E$), the corresponding output designation ($n = 1...3$) and the designation of the allocated mode for this output. If a special function has been allocated to an output (or to several jointly), then the reference to the allocated special function is not contained in the parameter window header (name) but is written in the window itself above the first parameter.

You use this parameter window to set:

- whether the output is to work as a NO (normally open) contact or as an NC (normally closed) contact,
- whether a night mode with limited on-period is wanted and how long the on-period is to be,
- whether there is to be a warning in night mode before switching off,
- whether an ON delay is to be included,
- whether an OFF delay is to be included,
- whether a logic operation is wanted,
- whether there is to be a permanent or time-limited manual override option,
- whether a forced control is to be included,
- which switching status the output is to assume in the event of a bus voltage failure and which one the output and a logic object (if available) are to assume after bus voltage recovery.

"X-n: Behavior timer mode" parameter window

If "Timer mode" has been allocated to an output, then you can set the following parameters via this window:

- whether receiving another ON command can retrigger a started ON time to the configured value,
- whether the output is to work as a NO contact or as an NC contact,
- whether there is to be a warning before switching off,
- how long the output is to be switched on,
- whether a logic operation is wanted,
- whether a forced control is to be included,
- which switching status the output is to assume in the event of a bus voltage failure and which one the output and a logic object (if available) are to assume after bus voltage recovery.

"X-n: Behavior thermal drive control mode" parameter window

If "Thermal drive control mode" has been allocated to an output, then you can set the following parameters via this window:

- whether the output is to be controlled by a 1-bit or an 8-bit object,
- whether the valve in the de-energised state is to be open or closed,
- up to which actuating variable value the valve is to remain closed,
- from which actuating variable value the valve is to be completely open already,
- to which least value (hysteresis) the actuating variable must be changed in order to compute a new ON or OFF time,
- which cycle time is to be included for pulse width modulation (PWM),
- whether the valve is to be opened once every 72 hours to avoid a blockage,
- which switching status the output is to assume in the event of a bus voltage failure and which after bus voltage recovery.

"X-n: Evaluation normal mode" parameter window

The header (or name) of this window contains the corresponding module designation ($X = A...E$), the corresponding output designation ($n = 1...3$) and the designation of the allocated mode for this output. If a special function has been allocated to an output (or to several jointly), then the reference to the allocated special function is not contained in the parameter window header (name) but is written in the window itself above the first parameter.

You use this parameter window to set:

- whether a switching status object is to be added to this output,

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- whether a switching cycle count is to take place without or with monitoring of an upper limit,
- whether an operating hours count is to take place without or with monitoring of an upper limit,
- whether the load current is to be monitored for underload and/or overload,
- at which set point value the load current is to be monitored,
- from when a deviation (hysteresis) of the load current set point value is to be reported,
- whether and when the current load current value is to be sent via the bus,
- to which value the load current has to be changed before it is to be sent again and
- on which cycle time elapsing the load current is to be sent again.

"X-n: Evaluation thermal drive control mode" parameter window

If the "Thermal drive control mode" function has been allocated to an output, then you use this window to select whether a switching status object is to be added to this output.

In this mode, all other parameters normally contained in the "Evaluation" parameter window are canceled.

"X-n: 8-bit scene control" parameter window

The header (or name) of this window contains the corresponding module designation (X = A...E) and the corresponding output designation (n = 1...3).

If 8-bit scene control has been enabled in the N 512/11, then you use this window to set in which scenes the corresponding output is to be integrated (max. 8 assignments possible).

Special functionsConfigure all outputs identically

If you select the special function "Configure all outputs identically", then only setting of the mode and the "Behavior" and "Evaluation" parameter windows will be offered for output 1, because both other outputs will automatically be configured identically to output 1.

3-phase switching

If you select the special function "3-phase switching", then only setting of the mode and the "Behavior" and "Evaluation" parameter windows will be offered for output 1, because both other outputs will automatically be configured identically to output 1. In "3-phase switching", you can only select "Normal mode" and "Timer mode" as the mode for output 1.

Fan speed control 1...3-stage

If you select the special function "Fan speed control 1-stage", then the mode for outputs 2 and 3 is still freely settable. If you select "Fan speed control 2-stage", then the mode for output 3 is still freely settable. In each case, the corresponding "Behavior", "Evaluation" and "8-bit scene control" (if enabled) parameter windows are then also added to the freely settable outputs automatically.

"X: Fan speed control" parameter window

If the "Fan speed control" function has been allocated to one or more outputs, then you can set the following parameters via this window:

- whether the actuating variables for heating and cooling mode are transferred via a joint object or via separate objects,
- from which control value in each case to switch from OFF to fan speed stage 1, from this to fan speed stage 2 and from this to fan speed stage 3,
- the difference by which one of the threshold values for the change-over to the next higher fan speed stage must be under-run in order for there to be an automatic switch-over to the next lower fan speed stage,
- whether in manual mode the wanted fan speed stage is set via a percentage or via the switching stages 0...3,
- at which fan speed stage to switch on a bus voltage failure and on bus voltage recovery and
- whether status objects are to be added for "Automatic mode" and to report the current fan speed stage.

2. Communication objects

The following 287 communication objects are available in the N 512/11 switching actuator. Which of them are visible and can be linked with group addresses will be determined by setting the parameters.

Maximum number of group addresses:	511
Maximum number of assignments:	511

Note

The number and type of visible objects can vary. Never are all objects available together.

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No.	Object name	Function	Number of bits	Flags
1	Status direct mode	On/Off	1 Bit	CRT
2	8-bit scene	Recall/program	1 Byte	CRWT
3	A-1, Switching/Actuating variable switching	On/Off	1 Bit	CRWT
4	A-1, Night mode	On/Off	1 Bit	CRWT
5	A-1, Logic operation	On/Off	1 Bit	CW
6	A-1, Manual override	On/Off	1 Bit	CW
7	A-1, Forced control	On/Off	2 Bit	CRW
8	A-1, Actuating variable continuous	Percent value	1 Byte	CW
9	A, Fan actuating variable heating / Controller	Percent value	1 Byte	CW
10	A, Fan actuating variable cooling	Percent value	1 Byte	CW
11	A, Fan automatic operation mode	On	1 Bit	CW
12	A, Fan speed stage in manual operation mode	Value 0...255	1 Byte	CW
13	A-1, Status switching	On/Off	1 Bit	CRT
14	A-1, Threshold for switching cycles	Set	4 Bytes	CRWT
15	A-1, Number of switching cycles	Counter value	4 Bytes	CRWT
16	A-1, Exceeding switching cycles threshold	On/Off	1 Bit	CRT
17	A-1, Threshold for operating hours	Set	4 Bytes	CRWT
18	A-1, Operating hours	Counter value	4 Bytes	CRWT
19	A-1, Exceeding operating hours threshold	On/Off	1 Bit	CRT
20	A-1, Exceeding load current set point value	On/Off	1 Bit	CRT
21	A-1, Load current set point value shortfall	On/Off	1 Bit	CRT
22	A-1, Save load current as set point value	On	1 Bit	CW
23	A-1, Measured value of load current	Value 0-23000	2 Bytes	CRT
24	A, Status fan automatic mode	On/Off	1 Bit	CRT
25	A, Status fan speed stage	Value 0...3	1 Byte	CRT
26	A-2, Switching/Actuating variable switching	On/Off	1 Bit	CRWT
27	A-2, Night mode	On/Off	1 Bit	CRWT
28	A-2, Logic operation	On/Off	1 Bit	CW
29	A-2, Manual override	On/Off	1 Bit	CW
30	A-2, Forced control	On/Off	2 Bit	CRW
31	A-2, Actuating variable continuous	Percent value	1 Byte	CW
32	A-2, Status switching	On/Off	1 Bit	CRT
33	A-2, Threshold for switching cycles	Set	4 Bytes	CRWT
34	A-2, Number of switching cycles	Counter value	4 Bytes	CRWT
35	A-2, Exceeding switching cycles threshold	On/Off	1 Bit	CRT
36	A-2, Threshold for operating hours	Set	4 Bytes	CRWT
37	A-2, Operating hours	Counter value	4 Bytes	CRWT
38	A-2, Exceeding operating hours threshold	On/Off	1 Bit	CRT
39	A-2, Exceeding load current set point value	On/Off	1 Bit	CRT
40	A-2, Load current set point value shortfall	On/Off	1 Bit	CRT
41	A-2, Save load current as set point value	On	1 Bit	CW
42	A-2, Measured value of load current	Value 0-23000	2 Bytes	CRT
43	A-3, Switching/Actuating variable switching	On/Off	1 Bit	CRWT
44	A-3, Night mode	On/Off	1 Bit	CRWT
45	A-3, Logic operation	On/Off	1 Bit	CW
46	A-3, Manual override	On/Off	1 Bit	CW
47	A-3, Forced control	On/Off	2 Bit	CRW
48	A-3, Actuating variable continuous	Percent value	1 Byte	CW
49	A-3, Status switching	On/Off	1 Bit	CRT
50	A-3, Threshold for switching cycles	Set	4 Bytes	CRWT
51	A-3, Number of switching cycles	Counter value	4 Bytes	CRWT
52	A-3, Exceeding switching cycles threshold	On/Off	1 Bit	CRT
53	A-3, Threshold for operating hours	Set	4 Bytes	CRWT
54	A-3, Operating hours	Counter value	4 Bytes	CRWT
55	A-3, Exceeding operating hours threshold	On/Off	1 Bit	CRT
56	A-3, Exceeding load current set point	On/Off	1 Bit	CRT
57	A-3, Load current set point value shortfall	On/Off	1 Bit	CRT
58	A-3, Save load current as set point value	On	1 Bit	CW

No.	Object name	Function	Number of bits	Flags
59	A-3, Measured value of load current	Value 0-23000	2 Bytes	CRT
60	B-1, Switching/Actuating variable switching	On/Off	1 Bit	CRWT
61	B-1, Night mode	On/Off	1 Bit	CRWT
62	B-1, Logic operation	On/Off	1 Bit	CW
63	B-1, Manual override	On/Off	1 Bit	CW
64	B-1, Forced control	On/Off	2 Bit	CRW
65	B-1, Actuating variable continuous	Percent value	1 Byte	CW
66	B, Fan actuating variable heating/controller	Percent value	1 Byte	CW
67	B, Fan actuating variable cooling	Percent value	1 Byte	CW
68	B, Fan automatic operation mode	On	1 Bit	CW
69	B, Fan speed stage in manual operation mode	Value 0...255	1 Byte	CW
70	B-1, Status switching	On/Off	1 Bit	CRT
71	B-1, Switching cycles threshold	Set	4 Bytes	CRWT
72	B-1, Number of switching cycles	Counter value	4 Bytes	CRWT
73	B-1, Exceeding switching cycles threshold	On/Off	1 Bit	CRT
74	B-1, Threshold for operating hours	set	4 Bytes	CRWT
75	B-1, Operating hours	Counter value	4 Bytes	CRWT
76	B-1, Exceeding operating hours threshold	On/Off	1 Bit	CRT
77	B-1, Exceeding load current set point value	On/Off	1 Bit	CRT
78	B-1, Load current set point value shortfall	On/Off	1 Bit	CRT
79	B-1, Save load current as set point value	On	1 Bit	CW
80	B-1, Measured value of load current	Value 0-23000	2 Bytes	CRT
81	B, Status fan automatic mode	On/Off	1 Bit	CRT
82	B, Status fan speed stage	Value 0...3	1 Byte	CRT
83	B-2, Switching/Actuating variable switching	On/Off	1 Bit	CRWT
84	B-2, Night mode	On/Off	1 Bit	CRWT
85	B-2, Logic operation	On/Off	1 Bit	CW
86	B-2, Manual override	On/Off	1 Bit	CW
87	B-2, Forced control	On/Off	2 Bit	CRW
88	B-2, Actuating variable continuous	Percent value	1 Byte	CW
89	B-2, Status switching	On/Off	1 Bit	CRT
90	B-2, Threshold for switching cycles	Set	4 Bytes	CRWT
91	B-2, Number for switching cycles	Counter value	4 Bytes	CRWT
92	B-2, Exceeding switching cycles threshold	On/Off	1 Bit	CRT
93	B-2, Threshold for operating hours	Set	4 Bytes	CRWT
94	B-2, Operating hours	Counter value	4 Bytes	CRWT
95	B-2, Exceeding operating hours threshold	On/Off	1 Bit	CRT
96	B-2, Exceeding load current set point value	On/Off	1 Bit	CRT
97	B-2, Load current set point value shortfall	On/Off	1 Bit	CRT
98	B-2, Save load current as set point value	On	1 Bit	CW
99	B-2, Measured value of load current	Value 0-23000	2 Bytes	CRT
100	B-3, Switching/Actuating variable switching	On/Off	1 Bit	CRWT
101	B-3, Night mode	On/Off	1 Bit	CRWT
102	B-3, Logic operation	On/Off	1 Bit	CW
103	B-3, Manual override	On/Off	1 Bit	CW
104	B-3, Forced control	On/Off	2 Bit	CRW
105	B-3, Actuating variable continuous	Percent value	1 Byte	CW
106	B-3, Status switching	On/Off	1 Bit	CRT
107	B-3, Threshold for switching cycles	Set	4 Bytes	CRWT
108	B-3, Number of switching cycles	Counter value	4 Bytes	CRWT
109	B-3, Exceeding switching cycles threshold	On/Off	1 Bit	CRT
110	B-3, Threshold for operating hours	Set	4 Bytes	CRWT
111	B-3, Operating hours	Counter value	4 Bytes	CRWT
112	B-3, Exceeding operating hours threshold	On/Off	1 Bit	CRT
113	B-3, Exceeding load current set point value	On/Off	1 Bit	CRT
114	B-3, Load current set point value shortfall	On/Off	1 Bit	CRT
115	B-3, Save load current as set point value	On	1 Bit	CW
116	B-3, Measured value of load current	Value 0-23000	2 Bytes	CRT
117	C-1, Switching/Actuating variable switching	On/Off	1 Bit	CRWT
118	C-1, Night mode	On/Off	1 Bit	CRWT
119	C-1, Logic operation	On/Off	1 Bit	CW
120	C-1, Manual override	On/Off	1 Bit	CW
121	C-1, Forced control	On/Off	2 Bit	CRW
122	C-1, Actuating variable continuous	Percent value	1 Byte	CW

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No.	Object name	Function	Number of bits	Flags
123	C, Fan actuating variable heating/controller	Percent value	1 Byte	CW
124	C, Fan actuating variable cooling	Percent value	1 Byte	CW
125	C, Fan automatic operation mode	On	1 Bit	CW
126	C, Fan speed stage in manual operation mode	Value 0...255	1 Byte	CW
127	C-1, Status switching	On/Off	1 Bit	CRT
128	C-1, Threshold for switching cycles	Set	4 Bytes	CRWT
129	C-1, Number of switching cycles	Counter value	4 Bytes	CRWT
130	C-1, Exceeding operating hours threshold	On/Off	1 Bit	CRT
131	C-1, Threshold for operating hours	Set	4 Bytes	CRWT
132	C-1, Operating hours	Counter value	4 Bytes	CRWT
133	C-1, Exceeding operating hours threshold	On/Off	1 Bit	CRT
134	C-1, Exceeding load current set point value	On/Off	1 Bit	CRT
135	C-1, Load current set point value shortfall	On/Off	1 Bit	CRT
136	C-1, Save load current as set point value	On	1 Bit	CW
137	C-1, Measured value of load current	Value 0-23000	2 Bytes	CRT
138	C, Status fan automatic mode	On/Off	1 Bit	CRT
139	C, Status fan speed stage	Value 0...3	1 Byte	CRT
140	C-2, Switching/Actuating variable switching	On/Off	1 Bit	CRWT
141	C-2, Night mode	On/Off	1 Bit	CRWT
142	C-2, Logic operation	On/Off	1 Bit	CW
143	C-2, Manual override	On/Off	1 Bit	CW
144	C-2, Forced control	On/Off	2 Bit	CRW
145	C-2, Actuating variable continuous	Percent value	1 Byte	CW
146	C-2, Status switching	On/Off	1 Bit	CRT
147	C-2, Threshold for switching cycles	Set	4 Bytes	CRWT
148	C-2, Number of switching cycles	Counter value	4 Bytes	CRWT
149	C-2, Exceeding switching cycles threshold	On/Off	1 Bit	CRT
150	C-2, Threshold for operating hours	Set	4 Bytes	CRWT
151	C-2, Operating hours	Counter value	4 Bytes	CRWT
152	C-2, Exceeding operating hours threshold	On/Off	1 Bit	CRT
153	C-2, Exceeding load current set point value	On/Off	1 Bit	CRT
154	C-2, Load current set point value shortfall	On/Off	1 Bit	CRT
155	C-2, Save load current as set point value	On	1 Bit	CW
156	C-2, Measured value of load current	Value 0-23000	2 Bytes	CRT
157	C-3, Switching/Actuating variable switching	On/Off	1 Bit	CRWT
158	C-3, Night mode	On/Off	1 Bit	CRWT
159	C-3, Logic operation	On/Off	1 Bit	CW
160	C-3, Manual override	On/Off	1 Bit	CW
161	C-3, Forced control	On/Off	2 Bit	CRW
162	C-3, Actuating variable continuous	Percent	1 Byte	CW
163	C-3, Status switching	On/Off	1 Bit	CRT
164	C-3, Threshold for switching cycles	Set	4 Bytes	CRWT
165	C-3, Number of switching cycles	Counter value	4 Bytes	CRWT
166	C-3, Exceeding switching cycles threshold	On/Off	1 Bit	CRT
167	C-3, Threshold for operating hours	Set	4 Bytes	CRWT
168	C-3, Operating hours	Counter value	4 Bytes	CRWT
169	C-3, Exceeding operating hours threshold	On/Off	1 Bit	CRT
170	C-3, Exceeding load current set point value	On/Off	1 Bit	CRT
171	C-3, Load current set point value shortfall	On/Off	1 Bit	CRT
172	C-3, Save load current as set point value	On	1 Bit	CW
173	C-3, Measured value of load current	Value 0-23000	2 Bytes	CRT
174	D-1, Switching/Actuating variable switching	On/Off	1 Bit	CRWT
175	D-1, Night mode	On/Off	1 Bit	CRWT
176	D-1, Logic operation	On/Off	1 Bit	CW
177	D-1, Manual override	On/Off	1 Bit	CW
178	D-1, Forced control	On/Off	2 Bit	CRW
179	D-1, Actuating variable continuous	Percent value	1 Byte	CW
180	D, Fan actuating variable heating/controller	Percent value	1 Byte	CW
181	D, Fan actuating variable cooling	Percent value	1 Byte	CW

No.	Object name	Function	Number of bits	Flags
182	D, Fan automatic operation mode	On	1 Bit	CW
183	D, Fan speed stage in manual operation mode	Value 0...255	1 Byte	CW
184	D-1, Status switching	On/Off	1 Bit	CRT
185	D-1, Threshold for switching cycles	Set	4 Bytes	CRWT
186	D-1, Number of switching cycles	Counter value	4 Bytes	CRWT
187	D-1, Exceeding switching cycles threshold	On/Off	1 Bit	CRT
188	D-1, Threshold for operating hours	Set	4 Bytes	CRWT
189	D-1, Operating hours	Counter value	4 Bytes	CRWT
190	D-1, Exceeding operating hours threshold	On/Off	1 Bit	CRT
191	D-1, Exceeding load current set point value	On/Off	1 Bit	CRT
192	D-1, Load current set point value shortfall	On/Off	1 Bit	CRT
193	D-1, Save load current as set point value	On	1 Bit	CW
194	D-1, Measured value of load current	Value 0-23000	2 Bytes	CRT
195	D, Status fan automatic mode	On/Off	1 Bit	CRT
196	D, Status fan speed stage	Value 0...3	1 Byte	CRT
197	D-2, Switching/Actuating variable switching	On/Off	1 Bit	CRWT
198	D-2, Night mode	On/Off	1 Bit	CRWT
199	D-2, Logic operation	On/Off	1 Bit	CW
200	D-2, Manual override	On/Off	1 Bit	CW
201	D-2, Forced control	On/Off	2 Bit	CRW
202	D-2, Actuating variable continuous	Percent value	1 Byte	CW
203	D-2, Status switching	On/Off	1 Bit	CRT
204	D-2, Threshold for switching cycles	Set	4 Bytes	CRWT
205	D-2, Number of switching cycles	Counter value	4 Bytes	CRWT
206	D-2, Exceeding switching cycles threshold	On/Off	1 Bit	CRT
207	D-2, Threshold for operating hours	Set	4 Bytes	CRWT
208	D-2, Operating hours	Counter value	4 Bytes	CRWT
209	D-2, Exceeding operating hours threshold	On/Off	1 Bit	CRT
210	D-2, Exceeding load current set point value	On/Off	1 Bit	CRT
211	D-2, Load current set point value shortfall	On/Off	1 Bit	CRT
212	D-2, Save load current as set point value	On	1 Bit	CW
213	D-2, Measured value of load current	Value 0-23000	2 Bytes	CRT
214	D-3, Switching/Actuating variable switching	On/Off	1 Bit	CRWT
215	D-3, Night mode	On/Off	1 Bit	CRWT
216	D-3, Logic operation	On/Off	1 Bit	CW
217	D-3, Manual override	On/Off	1 Bit	CW
218	D-3, Forced control	On/Off	2 Bit	CRW
219	D-3, Actuating variable continuous	Percent value	1 Byte	CW
220	D-3, Status switching	On/Off	1 Bit	CRT
221	D-3, Threshold for switching cycles	Set	4 Bytes	CRWT
222	D-3, Number of switching cycles	Counter value	4 Bytes	CRWT
223	D-3, Exceeding switching cycles threshold	On/Off	1 Bit	CRT
224	D-3, Threshold for operating hours	Set	4 Bytes	CRWT
225	D-3, Operating hours	Counter value	4 Bytes	CRWT
226	D-3, Exceeding operating hours threshold	On/Off	1 Bit	CRT
227	D-3, Exceeding load current set point value	On/Off	1 Bit	CRT
228	D-3, Load current set point value shortfall	On/Off	1 Bit	CRT
229	D-3, Save load current as set point value	On	1 Bit	CW
230	D-3, Measured value of load current	Value 0-23000	2 Bytes	CRT
231	E-1, Switching/Actuating variable switching	On/Off	1 Bit	CRWT
232	E-1, Night mode	On/Off	1 Bit	CRWT
233	E-1, Logic operation	On/Off	1 Bit	CW
234	E-1, Manual override	On/Off	1 Bit	CW
235	E-1, Forced control	On/Off	2 Bit	CRW
236	E-1, Actuating variable continuous	Percent value	1 Byte	CW
237	E, Fan actuating variable heating/controller	Percent value	1 Byte	CW
238	E, Fan actuating variable cooling	Percent value	1 Byte	CW
239	E, Fan automatic operation mode	On	1 Bit	CW

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No.	Object name	Function	Number of bits	Flags
240	E, Fan speed stage in manual operation mode	Value 0...255	1 Byte	CW
241	E-1, Status switching	On/Off	1 Bit	CRT
242	E-1, Threshold for switching cycles	Set	4 Bytes	CRWT
243	E-1, Number of switching cycles	Counter value	4 Bytes	CRWT
244	E-1, Exceeding switching cycles threshold	On/Off	1 Bit	CRT
245	E-1, Threshold for operating hours	Set	4 Bytes	CRWT
246	E-1, Operating hours	Counter value	4 Bytes	CRWT
247	E-1, Exceeding operating hours threshold	On/Off	1 Bit	CRT
248	E-1, Exceeding load current set point value	On/Off	1 Bit	CRT
249	E-1, Load current set point value shortfall	On/Off	1 Bit	CRT
250	E-1, Save load current as set point value	On	1 Bit	CW
251	E-1, Measured value of load current	Value 0-23000	2 Bytes	CRT
252	E, Status fan automatic mode	On/Off	1 Bit	CRT
253	E, Status fan speed stage	Value 0...3	1 Byte	CRT
254	E-2, Switching/Actuating variable switching	On/Off	1 Bit	CRWT
255	E-2, Night mode	On/Off	1 Bit	CRWT
256	E-2, Logic operation	On/Off	1 Bit	CW
257	E-2, Manual override	On/Off	1 Bit	CW
258	E-2, Forced control	On/Off	2 Bit	CRW
259	E-2, Actuating variable continuous	Percent value	1 Byte	CW
260	E-2, Status Switching	On/Off	1 Bit	CRT
261	E-2, Threshold for switching cycles	Set	4 Bytes	CRWT
262	E-2, Number of switching cycles	Counter value	4 Bytes	CRWT
263	E-2, Exceeding switching cycles threshold	On/Off	1 Bit	CRT
264	E-2, Threshold for operating hours	Set	4 Bytes	CRWT
265	E-2, Operating hours	Counter value	4 Bytes	CRWT
266	E-2, Exceeding operating hours threshold	On/Off	1 Bit	CRT
267	E-2, Exceeding load current set point value	On/Off	1 Bit	CRT
268	E-2, Load current set point value shortfall	On/Off	1 Bit	CRT
269	E-2, Save load current as set point value	On	1 Bit	CW
270	E-2, Measured value of load current	Value 0-23000	2 Bytes	CRT
271	E-3, Switching/Actuating variable switching	On/Off	1 Bit	CRWT
272	E-3, Night mode	On/Off	1 Bit	CRWT
273	E-3, Logic operation	On/Off	1 Bit	CW
274	E-3, Manual override	On/Off	1 Bit	CW
275	E-3, Forced control	On/Off	2 Bit	CRW
276	E-3, Actuating variable continuous	Percent value	1 Byte	CW
277	E-3, Status switching	On/Off	1 Bit	CRT
278	E-3, Threshold for switching cycles	Set	4 Bytes	CRWT
279	E-3, Number of switching cycles	Counter value	4 Bytes	CRWT
280	E-3, Exceeding switching cycles threshold	On/Off	1 Bit	CRT
281	E-3, Threshold for operating hours	Set	4 Bytes	CRWT
282	E-3, Operating hours	Counter value	4 Bytes	CRWT
283	E-3, Exceeding operating hours threshold	On/Off	1 Bit	CRT
284	E-3, Exceeding load current set point value	On/Off	1 Bit	CRT
285	E-3, Load current set point value shortfall	On/Off	1 Bit	CRT
286	E-3, Save load current as set point value	On	1 Bit	CW
287	E-3, Measured value of load current	Value 0-23000	2 Bytes	CRT

Object	Object name	Function	Type	Flags
1	Status direct mode	On / Off	1 Bit	CRT
<p>You use this object to report that the actuator has been switched via the "Direct mode" button on its top from bus mode to direct mode (Direct mode = On) or that it has been switched back from direct mode to bus mode (Direct mode = Off). If direct mode is switched on (the corresponding yellow LED on top of the actuator lights up), direct switching of the actuator outputs by a toggling function is enabled via the corresponding button on top of the actuator. In direct mode the actuator does not execute switching or scene commands received via the bus, but stores them as a wanted set point state. After switching back to bus mode (the yellow LED for indicating direct mode on top of the actuator is not lit), the actuator compares the current output states with the stored set point states and automatically corrects deviations of the current states from the set point states.</p> <p>Direct mode status is transferred automatically after bus voltage recovery.</p>				
2	8-bit scene	recall / program	1 Byte	CRWT
<p>You use this object to recall (restore) or program the 8-bit scene with the number x (x = 1...64).</p> <p>Bits 0...5 contain (in binary code) the number of the wanted scene as a decimal number between 1 and 64 (in which the decimal number 1 equals the binary number 0, the decimal number 2 equals the binary number 1, etc.). If bit 7 = logical 1, then the scene is programmed and if bit 7 = logical 0, then it is recalled. Bit 6 is currently spare and must be set to logical 0.</p>				
3 (26, 43)	A-1 (A-2, A-3), Switching (or: Actuating variable switching)	On / Off	1 Bit	CRWT
<p>Via these objects switching telegrams are received in normal or timer mode which are forwarded where necessary to the corresponding output via the time function. In thermal drive control mode the switching commands from the controller are received via these objects. If a logic operation is configured in normal or timer mode, then the result of the time function is the 1st value for the logic combination for the corresponding output.</p>				

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Object	Object name	Function	Type	Flags
4 (27, 44)	A-1 (A-2, A-3), Night mode	On / Off	1 Bit	CRWT
<p>These objects can enable or disable "Night mode" for the corresponding output via the bus. The object can also be sent by a button, a timer or an automatic building management system, for example. If a logical one is received, then the corresponding output switches to night mode.</p> <p>In "Night mode" the output can no longer be switched on permanently, but only for a limited time (for example, lighting for cleaning for 30 minutes). If the "Warning before switching off" parameter (see corresponding "Behavior" parameter window) is set to "Yes" then, in night or timer mode, before the configured ON time has elapsed, you are informed, by the lighting switching on and off three times, that approximately 30 seconds after the first switching off the output will be switched off permanently. This lets you know the end of the ON time and by pressing the light switch again, the lighting will be left ON for a further 30 minutes, for example. If the parameter setting is "Night mode = No", this object is not needed and is therefore not displayed.</p>				
5 (28, 45)	A-1 (A-2, A-3), Logic operation	On / Off	1 Bit	CW
<p>Via these objects the switching information for the 2nd input of the logic operation to the corresponding output are received. If the parameter setting is "No logic operation", this object is not needed and is therefore not displayed.</p>				
6 (29, 46)	A-1 (A-2, A-3), Manual override	On / Off	1 Bit	CW
<p>These objects enable an output that has been switched OFF via its "normal" switching input (if need be, with a logic operation) to be switched back on permanently or for a time-limited period. This object only switches off the relevant output if the latter has also been switched off via its "normal" switching input (if need be, with a logic operation). In other cases, the output remains switched on. If the parameter setting is "Manual override = No", this object is not needed and is therefore not displayed.</p>				

Object	Object name	Function	Type	Flags															
7 (30, 47)	A-1 (A-2, A-3), Forced control	On / Off	2 Bits	CRW															
<p>These 2-bit objects enable a forced switching on or off of the corresponding output, regardless of all other objects impacting on the output.</p> <p>Bit 1 determines whether the forced control is "active" (= 1) or "passive" (0). If bit 1 = 0, then the forced control is "passive" and the switching input is available directly at the forced control output. If bit 1 of the forced control object = 1, then the forced control is "active" and the switching input is disabled. In this case, bit 0 of the forced control object determines the value of the internal forced control output. If forced control is blocked, the switching input is available directly at the internal output of the forced control function.</p> <table border="1" style="margin: 10px auto;"> <thead> <tr> <th>Bit 1</th> <th>Bit 0</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>Forced control disabled</td> </tr> <tr> <td>0</td> <td>1</td> <td>Forced control disabled</td> </tr> <tr> <td>1</td> <td>0</td> <td>Force controlled OFF</td> </tr> <tr> <td>1</td> <td>1</td> <td>Force controlled ON</td> </tr> </tbody> </table>					Bit 1	Bit 0	Function	0	0	Forced control disabled	0	1	Forced control disabled	1	0	Force controlled OFF	1	1	Force controlled ON
Bit 1	Bit 0	Function																	
0	0	Forced control disabled																	
0	1	Forced control disabled																	
1	0	Force controlled OFF																	
1	1	Force controlled ON																	
8 (31, 48)	A-1 (A-2, A-3), Actuating variable continuous	Percent value	1 Byte	CW															
<p>In "Thermal drive control" mode, these objects receive positioning telegrams from the thermostat, if the parameter "Control information via" is set to "8-bit object" in the "Behavior thermal drive control mode" parameter window. If, however, this parameter is set to "1-bit object", then this object is not needed and is therefore not displayed. Object 3 (or 26 or 43) "Actuating variable switching" is then available.</p>																			
9	A, Fan actuating variable heating (or: Fan actuating variable controller)	Percent value	1 Byte	CW															
<p>If the special function "Fan speed control" is enabled and if the parameter "Common control value object" is set to "Yes" in the "Fan control" parameter window, then this object is displayed as "Fan actuating variable controller". However, if this parameter is set to "No", then this object is set as "Fan actuating variable heating". The corresponding fan speed stage will be deduced from the control value received via this object from the thermostat.</p>																			
10	A, Fan actuating variable cooling	Percent value	1 Byte	CW															
<p>If the special function "Fan speed control" is enabled and if the parameter "Common control value object" is set to "NO" in the "Fan control" parameter window, then this object is displayed. In cooling mode, the corresponding fan speed will be deduced from the control value received via this object from the thermostat.</p>																			

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Object	Object name	Function	Type	Flags
11	A, Fan automatic operation mode	On	1 Bit	CW
After a fan speed stage was selected manually which led automatically to automatic mode being switched off, via this object automatic mode can be switched on again, i.e. automatic calculation of the fan speed stage from the received control value is re-enabled.				
12	A, Fan speed stage in manual operation mode	Value 0...255	1 Byte	CW
Given the parameter "Value range fan speeds in manual mode", which fan speed stage is to be enabled will be calculated from the value received by this object.				
13 (32, 49)	A-1 (A-2, A-3), Status switching	On / Off	1 Bit	CRT
The current switching state of the corresponding output is stored in the status object and this can be queried by a read request or will be sent automatically after each object value change according to the corresponding configuration. If the parameter setting is "Switching status object = No", this object is not needed and is therefore not displayed.				
14 (33, 50)	A-1 (A-2, A-3), Threshold for switching cycles	Set	4 Bytes	CRWT
By these objects the threshold for the switching cycle count for the relevant output can be sent as an integer value between 1 and 4,294,967,295 to the switching actuator via the bus. These objects are only available if the parameter "Counting of switching cycles" in the "Evaluation" parameter window is set in each case to "with threshold monitoring".				
15 (34, 51)	A-1 (A-2, A-3), Number of switching cycles	Counter value	4 Bytes	CRWT
By these objects the number of switching cycles for the relevant output (1 switching cycle = switch output on and off again once) can be sent at any time via the bus. These objects are only available if the parameter "Counting of switching cycles" in the "Evaluation" parameter window is set either to "without threshold monitoring" or to "with threshold monitoring".				
16 (35, 52)	A-1 (A-2, A-3), Exceeding switching cycles threshold	On / Off	1 Bit	CRT
By these objects the attaining or exceeding of the relevant switching cycle count threshold is reported via the bus respectively it can be queried whether the threshold is being exceeded. These objects are only available if the parameter "Counting of switching cycles" in the "Evaluation" parameter window is set in each case to "with threshold monitoring".				

Object	Object name	Function	Type	Flags
17 (36, 53)	A-1 (A-2, A-3), Threshold for operating hours	Set	4 Bytes	CRWT
By these objects the threshold for the operating hours count for the relevant output is sent as an integer value between 1 and 4,294,967,295 to the switching actuator via the bus. These objects are only available if the parameter "Counting of operating hours" in the "Evaluation" parameter window is set in each case to "with threshold monitoring".				
18 (37, 54)	A-1 (A-2, A-3), Operating hours	Counter value	4 Bytes	CRWT
By these objects the current number of operating hours for the relevant output (i.e. how many hours the output was ON) can be queried via the bus at any time. These objects are only available if the parameter "Counting of operating hours" in the "Evaluation" parameter window is set either to "without threshold monitoring" or to "with threshold monitoring".				
19 (38, 55)	A-1 (A-2, A-3), Exceeding operating hours threshold	On / Off	1 Bit	CRT
These objects report attaining or exceeding the relevant operating hours count threshold or interrogate via the bus whether a threshold is being exceeded. These objects are only available if the parameter "Operating hours count" in the "Analysis" parameter window is set in each case to "with threshold monitoring".				
20 (39, 56)	A-1 (A-2, A-3), Exceeding load current set point value	On / Off	1 Bit	CRT
By these objects the attaining or exceeding of the relevant load current set point is reported via the bus respectively it can be queried whether the load current set point is being exceeded. These objects are only available if the parameter "Load monitoring" in the "Evaluation" parameter window is set either to "on exceeding" or to "on shortfall and exceeding".				
21 (40, 57)	A-1 (A-2, A-3), Load current set point value shortfall	On / Off	1 Bit	CRT
By these objects the attaining or shortfall of the relevant load current set point is reported via the bus respectively it can be queried whether the load current set point is falling short. These objects are only available if the parameter "Load monitoring" in the "Evaluation" parameter window is set either to "on shortfall" or to "on shortfall and on exceeding".				

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Object	Object name	Function	Type	Flags
22 (41, 58)	A-1 (A-2, A-3), Save load current as set point value	On	1 Bit	CW
<p>By these objects the storage of the current load current as set point value for the load current monitoring is initiated. This requires a telegram with the value "1" to be received. If a telegram with the value "0" is received via this object, then the telegram is discarded. These objects are only available if the parameter "Load monitoring" in the "Evaluation" parameter window is <u>not</u> set in each case to "No".</p>				
23 (42, 59)	A-1 (A-2, A-3), Measured value of load current	Value 0...23000	2 Bytes	CRT
<p>By these objects the current load current reading is sent (on request, after a change, or cyclically) as an integer value in mA. These objects are only available if the parameter "Send measured value of load current" in the "Evaluation" parameter window is <u>not</u> set to "No" in each case.</p>				
24	A, Status fan automatic mode	On / Off	1 Bit	CRT
<p>It is sent by this object whether automatic computing of the fan speed stage is enabled (Automatic mode = On) or whether the fan speed stage has been set by the user of the room (Automatic mode = Off). This object is only available if the parameter "Status object automatic mode" in the "Fan control" parameter window is set to "Yes".</p>				
25	A, Status fan speed stage	Value 0...3	1 Byte	CRT
<p>By this object the current fan speed stage is sent. This object is only available if the parameter "Status object fan speed stage" in the "Fan control" parameter window is set to "Yes".</p>				

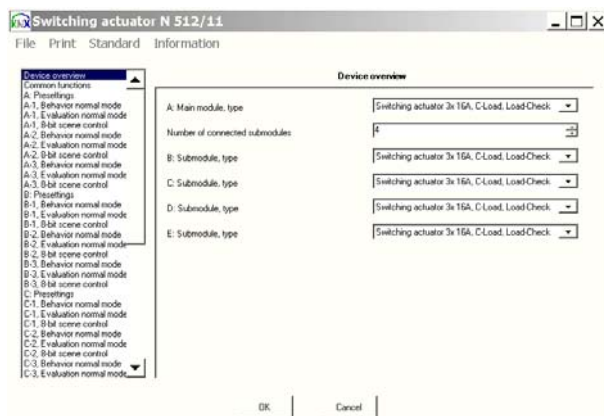
The above explanations apply accordingly to the communication objects for submodules B...E. Their communication objects begin with the object "X-1, Switching" (X = B...E) in

Device B: from the number 60,
 Device C: from the number 117,
 Device D: from the number 174,
 Device E: from the number 231.

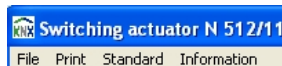
3. Parameter windows

3.1 Headline

The next picture shows the parameter window which pops up after you choose the ETS function "Edit Parameters..." in an as yet unconfigured device.



This window contains the following selections in the header:



File

If you select the "File" tab in the header, then you can choose one of the following actions:

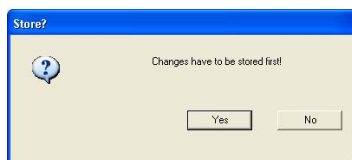
Save

Export

Import.

Save: Choosing this action stores the currently set parameters into the project database.

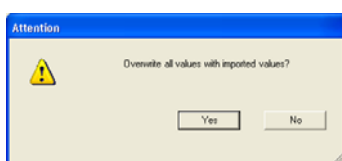
Export: The export function is used to export the device's current configuration in XML format from the ETS project database and save them on any drive in a file to be defined by the operator. The following window pops up after you select this action:



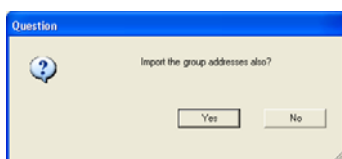
At this point, you should remember that all final parameter settings entered are to be saved initially in the project database before exporting the data. Only when this prompt has been answered with "Yes" does a new window open for selecting the drive and file to which the file export is to be made.

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Import: The import function is used to load the settings / group addresses for a N 512/11 switching actuator (which have been stored in a file via the export function) into another device. This can be used to copy configurations / group addresses into additional devices or to load them in a new device which was exchanged after a fault. The following window pops up after you select this action:



Only when this prompt has been answered with "Yes" does a new window open for selecting the drive and the xml file to be imported. After selecting the file to be imported, you will be prompted in the following window to confirm whether the allocated group addresses are also to be imported:



If you answer "Yes" to this prompt, then the allocated group addresses are imported.

Print

If you select the "Print" tab in the header, then you can choose one of the following actions:

Printer

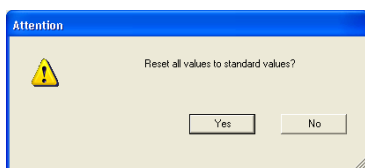
Preview.

Printer: After you select "Printer", a window opens for you to choose the printer on which the device settings are to be printed out for documentation purposes.

Preview: After selecting "Preview", a window opens with a print view of the device parameters.

Standard

After selecting this button, the following window opens:



If you press the "Yes" button, then all parameters are reset to their standard ex factory setting. This causes the loss of all settings that have not been archived via the export function.

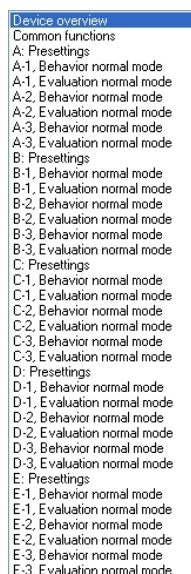
Information

After this button is selected, a window opens with information about the current release of the application program and an Internet link to Siemens Building Control. Clicking on the open Info window closes it.

Selectable parameter windows

The following picture shows the overview in the left of the ETS parameter window of all parameter window selections for a main module with four connected sub-modules. In all devices, all outputs are set to "Normal mode". The number and type of parameter window selections are determined by the number of connected submodules and the mode set for each output.

Ex works, the number of submodules is set to "4" and the modes for all outputs to "Normal mode". This ensures that, even without prior configuration of the main module and without communication via the bus, you can switch all outputs from all modules on and off with the buttons on top of the main module.



All parameter windows and the parameters contained in them are listed and explained below.

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3.2 Device overview

Device overview	
A: Main module, type	Switching actuator 3x 16A, C-Load, Load-Check
Number of connected submodules	4
B: Submodule, type	Switching actuator 3x 16A, C-Load, Load-Check
C: Submodule, type	Switching actuator 3x 16A, C-Load, Load-Check
D: Submodule, type	Switching actuator 3x 16A, C-Load, Load-Check
E: Submodule, type	Switching actuator 3x 16A, C-Load, Load-Check

This parameter window is used to set the number and type of submodules connected to the main module.

Parameter	Settings
A: Main module, type	Switching actuator 3x 16A, C-load, load-check
This is a pure display field that indicates which device type is connected to the bus as main module A..	
Number of connected submodules	0, 1, 2, 3, 4
<p>You must use this parameter to set how many submodules are actually connected to the main module.</p> <p>Ex works, the number of submodules is set to "4" and the modes for all outputs to "Normal mode". This ensures that, even without prior configuration of the main module and without communication via the bus, you can switch all outputs from all modules on and off with the buttons on top of the main module.</p> <p><u>Note:</u> If at this point you set a smaller number of submodules than are actually connected, then the main module will also not control those submodules that are not recorded by the set number.</p> <p>If at this point you set a larger number of submodules than are actually connected, then in each case the corresponding device LED on top of the main module flashes to indicate at which submodule a fault was detected.</p>	
B: (C:, D:, E:) Submodule, type	Switching actuator 3x 16A, C-load, load-check
<p>Whether and how many of these parameters are visible is determined by setting the previous parameter "Number of connected submodules".</p> <p>You use this parameter to set which submodule is connected to the main module as device B (or C, D or E). Currently, you can connect to it only submodules with the same switching outputs as in the main module.</p>	

3.3 Common functions

Common functions	
On-time direct mode in mm:ss (00:00...30:00; 00:00 = unlimited)	15:00
Send status / threshold objects	on request and after change of status
Transmission blocking period for status objects in seconds (1...15)	01
8-bit scene control	No

You use this parameter window to set those functions which are common to all devices (main module and sub-modules).

Parameter	Settings
On-time direct mode in mm:ss (00:00...30:00; 00:00 = unlimited)	15:00
Use this parameter to set whether direct mode is switched on permanently with the mode switching button and must be switched off by pressing this button again ("unlimited"), or whether it is switched on for a limited period and switches off automatically when the set time has elapsed. Time-limited switching on of direct mode ensures that bus mode cannot be blocked permanently by direct mode. Each press of the button in direct mode always leads to direct mode being extended by the set ON time. After the ON time has elapsed without a further key press, direct mode is switched off automatically and bus mode is re-enabled accordingly (if communication via the bus is possible). The corresponding communication object reports switching of direct mode on and off via the bus.	
Send status / threshold objects	on request on request and after change of status
This sets when the status and threshold objects are to be sent (only on request or on request and automatically after each status change).	
Transmission blocking period for status objects in seconds (1...15)	01
In order to avoid a prohibitively high bus load by simultaneous sending of numerous status / threshold objects after bus voltage recovery or after a restart of the main module, you can set an individual transmission blocking period. The status / threshold objects will be sent only after this has elapsed.	
8-bit scene control	No
Use this parameter to set whether the 8-bit scene control incorporated in the switching actuator is to be enabled. If so, the corresponding communication object and the parameter window "X-n, 8-bit scene control" are added for assignment of up to 8 scene numbers per output.	

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3.4 A: Presettings

A: Presettings	
Special function	No ▼
Operation mode output 1	Normal mode ▼
Operation mode output 2	Normal mode ▼
Operation mode output 3	Normal mode ▼

This parameter window is used per module (in this case, main module "A") to set the function or mode for each output.

Parameter	Settings
Special function	no; Configure all outputs identically; 3-phase switching; Fan speed control 1-stage; Fan speed control 2-stage; Fan speed control 3-stage
You use this parameter to select the common, identical configuration for all outputs of a module or the simultaneous, common switching of 3 outputs (3-phase switching) or a 1- to 3-stage fan speed control (e.g. for a fan coil unit or for a supply air fan or an exhaust air fan).	
Operation mode output 1 (2, 3)	Normal mode; Timer mode; Thermal drive control mode
These parameters are only visible for each output if no special function was selected. Depending on the special function selected, you can only set the mode for output 1 (as with "Configure all outputs identically" and with "3-phase switching") or only for outputs 2 and 3 (as with "Fan speed control 1-stage") or only for output 3 (as with "Fan speed control 2-stage") or you can no longer set the mode for any of the 3 outputs (as with " Fan speed control 3-stage "). You use these parameters to set whether the corresponding output is to work as a "normal" permanent switch or as a timer or be used to control a thermal drive for a small valve.	

3.5 A-n: Behavior normal mode

A-1, Behavior normal mode	
Relay mode	normally open contact ▼
Night mode	Yes ▼
On-time during night mode in hh:mm:ss <small>(00:00:00...23:59:59)</small>	00:30:00
Warning before switching off	Yes ▼
On-delay in hh:mm:ss <small>(00:00:00...23:59:59)</small>	00:00:00
Off-delay in hh:mm:ss <small>(00:00:00...23:59:59)</small>	00:00:00
Logic operation	AND function ▼
Manual override	Yes, time-limited ▼
Manual override period in h:mm:ss <small>(0:00:05...8:00:00)</small>	0:05:00
Forced control	Yes ▼
Behavior on bus voltage failure	no change ▼
Start value switching object after bus voltage recovery	as before voltage failure ▼
Start value logic object after bus voltage recovery	as before voltage failure ▼

This parameter window is used for the corresponding output (in the above picture, main module "A", output 1) to set the switching behavior in "Normal mode".

Parameter	Settings
Relay mode	Normally open contact normally closed contact
This parameter determines the behavior of the output (relay contact). With the "NC contact" setting, "Switch off" always means closing the contact and "Switch on" always means opening the contact. "NO contact": Off telegram = contact open, On telegram = contact closed. "NC contact": Off telegram = contact closed, On telegram = contact open.	
Night mode	No Yes
You use this parameter to set whether an additional "Night mode" communication object is to be available for this output. If night mode is on, the output can no longer be switched on permanently but only for a time-limited period (e.g. for lighting for cleaning). If you set this parameter to "Yes", then the following parameters "On-time during night mode in hh:mm:ss" and "Warning before switching off" are added.	
On-time during night mode in hh:mm:ss (00:00:00...23:59:59)	00:30:00
This parameter is visible only if the previous parameter "Night mode" is set to "Yes". You use it to set the wanted on-time in night mode.	

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Parameter	Settings
Warning before switching off	Yes No
You use this parameter in night mode to set the output such that it is not switched off immediately when the configured time has elapsed, but is switched off initially for only 1 second and is then switched on again for 10 seconds. This is repeated twice more before the output is then switched off permanently. If the output is used for lighting control, then a user is given advance warning and has time enough to switch the lighting on again.	
On-delay in hh:mm:ss (00:00:00...23:59:59)	00:00:00
This parameter sets the wanted on-delay time. The default value 00:00:00 means that ON commands are executed immediately. A set on-delay acts only on the "Switching" object and not on an object for a logic operation allocated to the output as well.	
Off-delay in hh:mm:ss (00:00:00...23:59:59)	00:00:00
This parameter sets the wanted off-delay time. The default value 00:00:00 means that OFF commands are executed immediately. A set off-delay acts only on the "Switching" object and not on a linking object allocated to the output as well.	
Logic operation	No logic operation AND function OR function
If need be, the switching of the output via a logic operation can be complemented with an object "X-n: Logic operation" as well. The logic operation object is not subject to a time delay, i.e. the logic operation is always effective immediately.	
Manual override	No Yes Yes, time-limited
This parameter determines whether an additional object "X-n: Manual override", via which an output switched off by the "normal" switching input (if need be with a logic operation) can be switched on again permanently or for a set time, is to be added to this output. This object only switches off the output if the latter has been switched off before via the "normal" switching input (if need be, with a logic operation). In other cases, the output remains switched on.	
Manual override period in h:mm:ss (0:00:05...8:00:00)	0:05:00
This parameter is visible only if the previous parameter "Manual override" is set to "Yes, time-limited". You use it to set the wanted on-time with manual override.	

Parameter	Settings															
Forced control	Yes No															
If necessary, you use this parameter to add the 2-bit object "X-n: Forced control", which allows forced switching on or off of the output, regardless of any other objects acting on the output. Bit 1 determines whether the forced control is "active" (= 1) or "passive" (0). If bit 1 = 0, then the forced control is "passive" and the switching input is available directly at the forced control output. If bit 1 of the forced control object = 1, then the forced control is "active" and the switching input is disabled. In this case, bit 0 of the forced control object determines the value of the internal forced control output. If forced control is blocked, the switching input is available directly at the internal output of the forced control function.																
<table border="1"> <thead> <tr> <th>Bit 1</th> <th>Bit 0</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>Forced control disabled</td> </tr> <tr> <td>0</td> <td>1</td> <td>Forced control disabled</td> </tr> <tr> <td>1</td> <td>0</td> <td>Force controlled OFF</td> </tr> <tr> <td>1</td> <td>1</td> <td>Force controlled ON</td> </tr> </tbody> </table>		Bit 1	Bit 0	Function	0	0	Forced control disabled	0	1	Forced control disabled	1	0	Force controlled OFF	1	1	Force controlled ON
Bit 1	Bit 0	Function														
0	0	Forced control disabled														
0	1	Forced control disabled														
1	0	Force controlled OFF														
1	1	Force controlled ON														
Behavior on bus voltage failure	Off On no change															
You use this parameter to set the wanted switching state of the output in the event of a bus voltage failure. If the bus voltage fails, the current switching state (if need be after execution of the configured switching command) will be saved permanently.																
Start value switching object after bus voltage recovery	as before voltage failure Off On															
You use this parameter to set the wanted switching state of the output in the event of bus voltage recovery. If the parameter is set to "as before voltage failure", then the output is set to the state stored at the time of the bus voltage failure.																
Start value logic object after bus voltage recovery	as before voltage failure Off On															
This parameter is visible only if the parameter "Logic operation" is <u>not</u> set to "No logic operation". You use this to set the wanted start value of the logic input after bus voltage recovery. If the parameter is set to "as before voltage failure", then the logic input is set to the value of the logic object stored at the time of the bus voltage failure.																

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3.6 A-n: Evaluation normal mode

A-1. Evaluation normal mode

Switching status object	Yes
Counting of switching cycles	with threshold monitoring
Counting of operating hours	with threshold monitoring
Load monitoring	on shortfall and exceedance
Set point value of load current in mA (130...20000)	16000
Hysteresis load current in mA (130...5000)	150
Send measured value of load current	on request and after change and cyclically
Send when change of value is greater than (value in mA; 130...5000)	150
Send cyclically every (h:mm; 0:05...2:00)	0:05

This parameter window is used for the corresponding output (in the above picture, main module "A", output 1) to set the monitoring and evaluation functions in "Normal mode".

Parameter	Settings
Switching status object	No Yes
You use this parameter to set whether a "X-n: Status switching" communication object is to be available for the corresponding output. For example, the status object can be used to display the current output switching status on a display, a panel or a PC with visualisation software.	
Counting of switching cycles	No; without threshold monitoring; with threshold monitoring
You use this parameter to enable switching cycle counting (i.e. how often an output has been switched on and off again) for the corresponding output. If the parameter is set to "without threshold monitoring", then only the communication object "X-n: Number of switching cycles" is added to this output. If the parameter is set to "with threshold monitoring", then the communication object "Threshold for switching cycles", which prescribes a threshold and the communication object "Exceeding switching cycles threshold", which reports the attaining or exceeding of the prescribed threshold, are also added.	

Parameter	Settings
Counting of operating hours	No; without threshold monitoring; with threshold monitoring
This parameter enables operating hours counting (i.e. for how many hours the output was switched on) for the corresponding output. If the parameter is set to "without threshold monitoring", then only the communication object "X-n: Operating hours" is added to this output. If the parameter is set to "with threshold monitoring", then the communication object "Threshold for operating hours", which prescribes a threshold and the communication object "Exceeding operating hours threshold", which reports the attaining or exceeding of the prescribed threshold, are also added.	
Load monitoring	No; on exceeding; on shortfall; on shortfall and exceeding
You use this parameter to enable load monitoring for overload, load failure or both for the relevant output. If the parameter is set to "on exceeding", then only the communication object "X-n: Exceeding load current set point value" is added to this output. If the parameter is set to "on shortfall", then only the communication object "X-n: Load current set point value shortfall" is added to this output. If the parameter is set to "on shortfall and exceeding", then both communication objects for reporting overload and load failure are added. Also, in all cases of load monitoring the communication object "Save load current as setpoint value", via which storing of the current load current reading as load current set point value is initiated, is added as well as both the following parameters "Set point value of load current in mA" and "Hysteresis load current in mA".	
Set point value of load current in mA (130...20000)	16000
This parameter is visible only if the previous parameter, "Load monitoring" is <u>not</u> set to "No". It is used to set the load current set point value for the corresponding output load check (i.e. load monitoring for exceeding and/or a shortfall compared with the set point value). <u>Note:</u> If the load current set point value is set as not above this parameter but above the communication object "X-n: Save load current as set point value", then this has the advantage that the set point value will then be exactly equal to the normal load current in operation. However, a set point value stored in this way cannot be read out via the bus.	

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Parameter	Settings
Hysteresis load current in mA (130...5000)	150
This parameter is visible only if the previous parameter, "Load monitoring", is <u>not</u> set to "No". It is used to set by which value the set point value should exceed or fall short in order that an exceeding or shortfall of the load current set point value will be reported.	
Send measured value of load current	No; on request; on request and after change; on request and after change and cyclically
This parameter determines whether and when the load current reading of this output is to be sent. If this parameter is <u>not</u> set to "No", then the communication object "X-n: Measured value of load current" is added.	
Send when change of value is greater than (value in mA; 130...5000)	150
This parameter is visible only if the previous parameter, "Send measured value of load current" is set either to "on request and after change" or to "on request and after change and cyclically". It is used to set by which value the load current must be changed before it is sent again automatically.	
Send cyclically every (h:mm; 0:05...2:00)	0:05
This parameter is visible only if the previous parameter, "Send measured value of load current" is set to "on request and after change and cyclically". It is used to set the wanted time interval for the cyclical sending of the load current reading.	

3.7 A-n: 8-bit scene control

A-1, 8-bit scene control

Device A output 1: Assignment 1	<input type="text" value="not used"/>
Device A output 1: Assignment 2	<input type="text" value="not used"/>
Device A output 1: Assignment 3	<input type="text" value="not used"/>
Device A output 1: Assignment 4	<input type="text" value="not used"/>
Device A output 1: Assignment 5	<input type="text" value="not used"/>
Device A output 1: Assignment 6	<input type="text" value="not used"/>
Device A output 1: Assignment 7	<input type="text" value="not used"/>
Device A output 1: Assignment 8	<input type="text" value="not used"/>

This parameter window is visible only if the parameter "8-bit scene control" in the "Common functions" parameter window is set to "Yes". It enables the relevant output to be incorporated in up to 8 scenes.

Parameter	Settings
Device A, output 1: Assignment 1	Not used 1 ... 64
This parameter incorporates output 1 of the main module A in an 8-bit scene with a number between 1 and 64. "Not used" means that this allocation option is not used. Notwithstanding, the output can be integrated in an 8-bit scene by other assignments. <u>Note:</u> If a scene is recalled before the corresponding switching states are programmed (stored) for this scene, then there is no response when the scene is recalled.	
Device A, output 1: Assignment 2	Not used 1 ... 64
This parameter incorporates output 1 of the main module A in a further 8-bit scene with a number between 1 and 64. "Not used" means that this allocation option is not used. Notwithstanding, the output can be integrated in an 8-bit scene by other assignments. <u>Note:</u> If a scene is recalled before the corresponding switching states are programmed (stored) for this scene, then there is no response when the scene is recalled.	

and so on until

Parameter	Settings
Device A, output 1: Assignment 8	Not used 1 ... 64
This parameter incorporates output 1 of the main module A in a further 8-bit scene with a number between 1 and 64. "Not used" means that this allocation option is not used. Notwithstanding, the output can be integrated in an 8-bit scene by other assignments. <u>Note:</u> If a scene is recalled before the corresponding switching states are programmed (stored) for this scene, then there is no response when the scene is recalled.	

Note: The scenes for all additional main module and submodule outputs are allocated accordingly.

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3.8 A-n: Behavior timer mode

A-1. Behavior timer mode	
Retriggering possible	Yes
Relay mode	normally open contact
Warning before switching off	Yes
On-time in hh:mm:ss (00:00:00..23:59:59)	00:15:00
Logic operation	AND function
Forced control	Yes
Behavior on bus voltage failure	no change
Start value switching object after bus voltage recovery	as before voltage failure
Start value logic object after bus voltage recovery	as before voltage failure

This parameter window is only visible if the "Operation mode" parameter for the corresponding output has been set to "Timer mode".

Parameter	Settings
Retriggering possible	No Yes
This parameter sets whether on receiving a new ON telegram during an on-period, this is restarted and thus the on-time is to be extended.	
Relay mode	normally open contact normally closed contact
This parameter determines the behavior of the output (relay contact). With the "NC contact" setting, "Switch off" always means closing the contact and "Switch on" always means opening the contact. "NO contact": Off telegram = contact open, On telegram = contact closed. "NC contact": Off telegram = contact closed, On telegram = contact open.	
Warning before switching off	Yes No
You use this parameter in night mode to set the output such that it is not switched off immediately when the configured time has elapsed, but is switched off initially for only 1 second and is then switched on again for 10 seconds. This is repeated twice more before the output is then switched off permanently. If the output is used for lighting control, then a user is given advance warning and has time enough to switch the lighting on again.	
On-time in hh:mm:ss (00:00:00..23:59:59)	00:15:00
This parameter sets the wanted on-time for the output in timer mode.	

Parameter	Settings															
Logic operation	no logic operation AND function OR function															
If need be, the switching of the output via a logic operation can be complemented by an additional object "X-n: Logic operation".																
Forced control	Yes No															
If necessary, you use this parameter to add the 2-bit object "X-n: Forced control", which allows forced switching on or off of the output, regardless of any other objects acting on the output. Bit 1 determines whether the forced control is "active" (= 1) or "passive" (0). If bit 1 = 0, then the forced control is "passive" and the switching input is available directly at the forced control output. If bit 1 of the forced control object = 1, then the forced control is "active" and the switching input is disabled. In this case, bit 0 of the forced control object determines the value of the internal forced control output. If forced control is blocked, the switching input is available directly at the internal output of the forced control function.																
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Bit 1	Bit 0	Function														
0	0	Forced control disabled														
0	1	Forced control disabled														
1	0	Force controlled OFF														
1	1	Force controlled ON														
Behavior on bus voltage failure	Off On no change															
You use this parameter to set the wanted switching state of the output in the event of a bus voltage failure. If the bus voltage fails, the current switching state (if need be after execution of the configured switching command) will be saved permanently.																
Start value switching object after bus voltage recovery	as before voltage failure; Off; On															
You use this parameter to set the wanted switching state of the output in the event of bus voltage recovery. If the parameter is set to "as before voltage failure", then the output is set to the state stored at the time of the bus voltage failure.																
Start value logic object after bus voltage recovery	as before voltage failure; Off; On															
This parameter is visible only if the parameter "Logic operation" is <u>not</u> set to "No logic operation". You use this to set the wanted start value of the logic input after bus voltage recovery. If the parameter is set to "as before voltage failure", then the logic input is set to the value of the logic object stored at the time of the bus voltage failure.																

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3.9 A-n: Evaluation timer mode

A-1. Evaluation timer mode

Switching status object	Yes
Counting of switching cycles	with threshold monitoring
Counting of operating hours	with threshold monitoring
Load monitoring	on shortfall and exceedance
Set point value of load current in mA (130...20000)	16000
Hysteresis load current in mA (130...5000)	150
Send measured value of load current	on request and after change and cyclically
Send when change of value is greater than (value in mA: 130...5000)	150
Send cyclically every (h:mm; 0:05...2:00)	0:05

The parameters in this parameter window are identical with the parameters in the parameter window "X-n; Evaluation normal mode" (see section 3.6).

3.10 A-n: Behavior thermal drive control mode

A-1. Behavior thermal drive control mode

Control information via	8-bit object
Valve deenergized	closed
Valve closed when actuating variable in % is lower than or equal (0...30)	0
Valve fully open when actuating variable in % is greater than or equal (70...100)	100
Hysteresis in % (3...15)	9
Cycle time for PWM in minutes (5...30)	15
Protection against valve blockage	Yes
Behavior on bus voltage failure	no change
Switching status on bus voltage recovery	as before voltage failure

This parameter window is only visible if the "Operation mode" parameter for the corresponding output has been set to "Thermal drive control mode".

Note: In "Thermal drive control mode", the parameter window for integrating the output into an 8-bit scene control is omitted.

Parameter	Settings
Control information via	1-bit object 8-bit object
This parameter sets whether the corresponding output will be controlled by a 1-bit object (switching command ON/OFF) or by an 8-bit object (positioning command 0...100%). If this parameter is set to "1-bit object", then the communication object "X-n: Actuating variable switching" will be added. In addition, the following parameters will not appear in the parameter window shown: - Valve closed when actuating variable in % is lower than or equal, - Valve fully open when actuating variable in % is greater than or equal, - Hysteresis in %, - Cycle time for PWM in minutes. If this parameter is set to "8-bit object", then the communication object "X-n: Actuating variable continuous" and all parameters listed in the shown parameter window will be displayed.	
Valve deenergized	closed; open
This parameter sets whether the valve is open or closed when the thermal drive is deenergized.	
Valve closed when actuating variable in % is lower than or equal (0...30)	0
This parameter is visible only if the previous parameter "Control information via" is set to "8-bit object". This parameter sets up to which percentaged opening the valve remains practically closed. Note: Heater valves frequently have an approximately S-shaped characteristic, i.e. the valve begins to open only from an actuating variable of say 30% and is almost completely open from an actuating variable of say 70%. The precise shape of the valve characteristic is to be found in the manufacturer's data sheet.	
Valve fully open when actuating variable in % is greater than or equal (70...100)	100
This parameter is visible only if the previous parameter "Control information via" is set to "8-bit object". This parameter sets from what percentaged opening the valve is practically completely open. Note: Heater valves frequently have an approximately S-shaped characteristic, i.e. the valve begins to open only from an actuating variable of say 30% and is almost completely open from an actuating variable of say 70%. The precise shape of the valve characteristic is to be found in the manufacturer's data sheet.	
Hysteresis in % (3...15)	9
This parameter is visible only if the previous parameter "Control information via" is set to "8-bit object". This parameter sets the percentage value by which a new actuating variable must differ from the last one received and converted into a pulse width modulated (PWM) on-time, in order to initiate the calculation of a new PWM on-time. Note: In pulse width modulation (PWM), the current actuating variable value (in the range from 0...100%) is converted into a variable on-time for the switching output, in which 0% equals an on-time of 0 minutes and 100% the PWM cycle time.	

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Parameter	Settings
Cycle time for PWM in minutes (5...30)	15
<p>This parameter is visible only if the previous parameter "Control information via" is set to "8-bit object".</p> <p>This parameter sets the on-time which corresponds to an actuating variable of 100%.</p> <p><u>Note:</u> The PWM cycle time corresponds to the sum of the times which the thermal drive needs to open the closed valve completely and to close the open valve completely again.</p>	
Protection against valve blockage	No Yes
<p>This parameter sets whether the corresponding switching output is to be switched on for 5 minutes if it was switched off for approximately 72 hours.</p> <p><u>Note:</u> Enabling this function can avoid the blockage of a valve during a period free from heating or cooling, if it has not been used for a longer period.</p>	
Behavior on bus voltage failure	Off On no change
<p>You use this parameter to set the wanted switching state of the output in the event of a bus voltage failure.</p> <p>If the bus voltage fails, the current switching state (if need be after execution of the configured switching command) will be saved permanently.</p>	
Switching status on bus voltage recovery	as before voltage failure Off On
<p>You use this parameter to set the wanted switching state of the output in the event of bus voltage recovery.</p> <p>If the parameter is set to "as before voltage failure", then the output is set to the state saved at the time of bus voltage failure.</p>	

3.11 A-n: Evaluation thermal drive control mode

A-1, Evaluation thermal drive control mode

Switching status object	Yes
-------------------------	-----

This parameter window is only visible if the "Operation mode" parameter for the corresponding output has been set to "Thermal drive control mode".

In this mode, you can only set with this parameter window whether an additional switching status object for requesting or automatic sending of the current switching status of the corresponding output is to be added.

3.12 Special function „Configure all outputs identically“

A: Presettings

Special function	Configure all outputs identically
Operation mode output 1	Normal mode

This parameter window is visible only if the parameter "Special function" is set to "Configure all outputs identically".

You can then only set the mode for output 1 of the relevant module, because the behavior of both subsequent outputs will be set automatically to be the same as that of output 1. Furthermore, only for output 1 are the corresponding parameter windows "Behavior" and "Evaluation" then visible and, as the case may be, the "8-bit scene control" parameter windows (except in "Thermal drive control" mode) for all the module's outputs.

3.13 Special function „3-phase switching“

A: Presettings

Special function	3-phase switching
Operation mode output 1	Normal mode

This parameter window is visible only if the parameter "Special function" is set to "3-phase switching".

You can then only set the mode for output 1 of the relevant module, because the behavior of both subsequent outputs will be set automatically to be the same as that of output 1. Therefore, the "Behavior" and "8-bit scene control" parameter windows will also be displayed only for output 1.

However, separate "Evaluation" windows will be displayed for all 3 outputs, in order that an operator can set separate monitoring of load currents, so that, e.g. the failure of a phase (i.e. an L-conductor) is reported.

In order that it can be seen in the "Behavior" and "Evaluation" parameter windows that they belong to a "3-phase switching" function, a corresponding note is visible in these parameter windows above the first parameter.

Note: In 3-phase switching, you can only set "Normal mode" and "Timer mode". Also, the parameter "Behavior on bus voltage failure" is absent in the "Behavior" parameter window.

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3.14 Special function „Fan speed control 1...3-stage“

Fan speed control 1-stage

A: Presettings	
Special function	Fan speed control 1-stage
Operation mode output 2	Normal mode
Operation mode output 3	Normal mode

If you select the special function "Fan speed control 1-stage", then the modes of outputs 2 and 3 are still freely configurable, because 1-stage fan speed control only occupies output 1.

Note: Only one fan speed control can be enabled for each module, either 1-stage or 2-stage or 3-stage.

A: Fan speed control	
Common control value object	No
Threshold stage 0 to 1 in % (2...90)	15
Hysteresis for switching to a lower fan speed stage in % (3...10)	5
Value range fan speeds in manual mode	0-1
Fan speed stage at bus voltage failure	no change
Fan speed stage on bus voltage recovery	as before voltage failure
Status object automatic mode	Yes
Status object fan speed stage	Yes

If you choose "Fan speed control 1-stage" as special function, then the parameter window "X: Fan control" includes the parameters shown in the above picture.

Parameter	Settings
Common control value object	No Yes
This parameter sets whether the thermostat sends its positioning commands for heating and cooling via a common object or via separate objects. If this parameter is set to "No", then both communication objects "X: Fan actuating variable heating" and "X: Fan actuating variable cooling" are displayed instead of the communication object "X: Fan actuating variable controller".	
Threshold stage 0 to 1 in % (2...90)	15
This parameter defines the actuating variable threshold on whose attainment or exceeding fan speed stage 1 is switched ON.	

Parameter	Settings
Hysteresis for switching to a lower fan speed stage in % (3...10)	5
You use this parameter to set by how many percent at least the actuating variable must be below the threshold of the current fan speed stage for switching to the next lower fan speed stage.	
Value range fan speeds in manual mode	0-1 (0-2; 0-3) 0...255
You use this parameter to set the permitted range of values for the object "Fan speed stage in manual operation mode". Whereas in the value ranges 0-1, 0-2 and 0-3, the received value equals the fan speed stage to be switched on, with values in the range 0...255, the received value is compared with the configured actuating variable thresholds (threshold stage 0 to 1 or 1 to 2 and 2 to 3) and thus calculated which stage is to be switched on.	
Fan speed stage at bus voltage failure	Off no change
This parameter is used to set which fan speed stage is to be switched on at a bus voltage failure.	
Fan speed stage on bus voltage recovery	As before voltage failure 0 1
This parameter is used to set which fan speed stage is to be switched on at bus voltage recovery.	
Status object automatic mode	No Yes
This parameter is used to set whether a 1-bit status object "X: Status fan automatic mode" is to be added, via which automatic mode status can be queried or sent automatically on status changes.	
Status object fan speed stage	No Yes
This parameter is used to set whether an 8-bit status object "X: Status object fan speed stage" is to be added, via which the current fan speed stage can be queried or sent automatically on status changes. The value range is 0...3, i.e. the transferred value equals the current fan speed stage.	

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Fan speed control 2-stage

A: Presettings	
Special function	Fan speed control 2-stage
Operation mode output 3	Normal mode

If you select the special function "Fan speed control 2-stage", then the mode of output 3 is still freely configurable, because 2-stage fan speed control only occupies outputs 1 and 2.

Note: Only one fan speed control can be enabled for each module, either 1-stage or 2-stage or 3-stage.

A: Fan speed control	
Common control value object	No
Threshold stage 0 to 1 in % (2..50)	15
Threshold stage 1 to 2 in % (10..90)	40
Hysteresis for switching to a lower fan speed stage in % (3..10)	5
Value range fan speeds in manual mode	0-2
Fan speed stage at bus voltage failure	no change
Fan speed stage on bus voltage recovery	as before voltage failure
Status object automatic mode	Yes
Status object fan speed stage	Yes

If you choose "Fan speed control 2-stage" as special function, then the parameter window "X: Fan control" includes the parameters shown in the above picture. These are the same as the parameters for "Fan speed control 1-stage" up to the additional parameter "Threshold stage 1 to 2 in %".

Parameter	Settings
Threshold stage 0 to 1 in % (2...50)	15
This parameter defines the actuating variable threshold on whose attainment or exceeding fan speed stage 1 is switched ON.	
Threshold stage 1 to 2 in % (10...90)	40
This parameter defines the actuating variable threshold on whose attainment or exceeding fan speed stage 2 is switched ON.	

Fan speed control 3-stage

A: Presettings	
Special function	Fan speed control 3-stage

If you choose the special function "Fan speed control 3-stage", then 3 outputs are occupied by this function.

A: Fan speed control	
Common control value object	No
Threshold stage 0 to 1 in % (2..50)	15
Threshold stage 1 to 2 in % (10..60)	40
Threshold stage 2 to 3 in % (30..90)	70
Hysteresis for switching to a lower fan speed stage in % (3..10)	5
Value range fan speeds in manual mode	0-3
Fan speed stage at bus voltage failure	no change
Fan speed stage on bus voltage recovery	as before voltage failure
Status object automatic mode	Yes
Status object fan speed stage	Yes

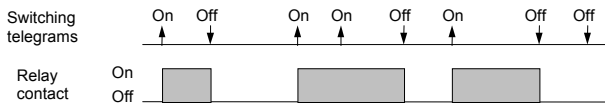
If you chose "Fan speed control 3-stage" as special function, then the parameter window "X: Fan control" includes the parameters shown in the above picture. These are the same as the parameters for "Fan speed control 2-stage" up to the additional parameter "Threshold stage 2 to 3 in %".

Parameter	Settings
Threshold stage 0 to 1 in % (2...50)	15
This parameter defines the actuating variable threshold on whose attainment or exceeding fan speed stage 1 is switched ON.	
Threshold stage 1 to 2 in % (10...60)	40
This parameter defines the actuating variable threshold on whose attainment or exceeding fan speed stage 2 is switched ON.	
Threshold stage 2 to 3 in % (30...90)	70
This parameter defines the actuating variable threshold on whose attainment or exceeding fan speed stage 3 is switched ON.	
Note: Because 3-stage switched fans often have starting problems in the 1 st speed stage, a 3-stage switched fan which is OFF and is to be switched to speed stage 1, is first switched for 1 second to speed stage 2 and then switched back from speed stage 2 to speed stage 1.	

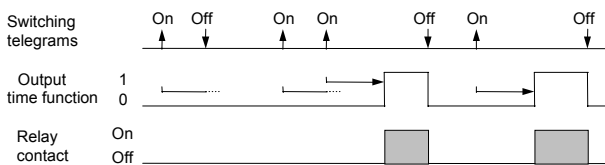
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4. Timing diagrams: Examples for one output

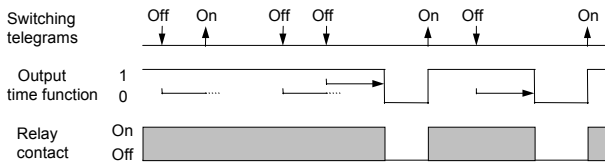
1. Switching without a time delay, no logic operation, relay mode: normally open contact



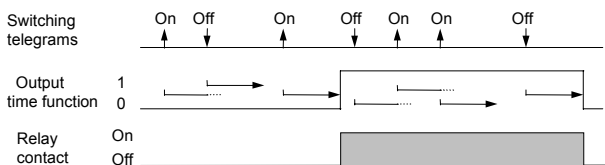
2. Switching with an On delay, no logic operation, relay mode: normally open contact



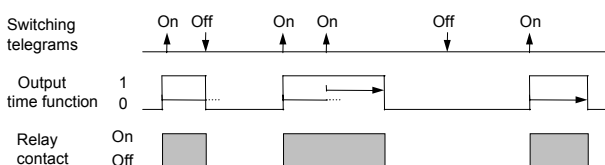
3. Switching with an Off delay, no logic operation, relay mode: normally open contact



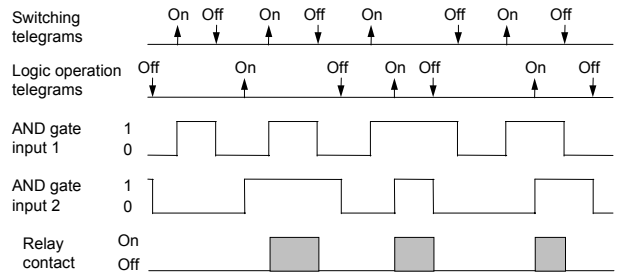
4. Switching with an On and Off delay, no logic operation, relay mode: normally open contact



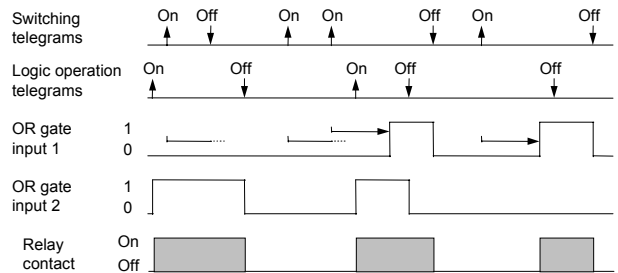
5. Switching with time switch function, no logic operation, no On delay, relay mode: normally open contact



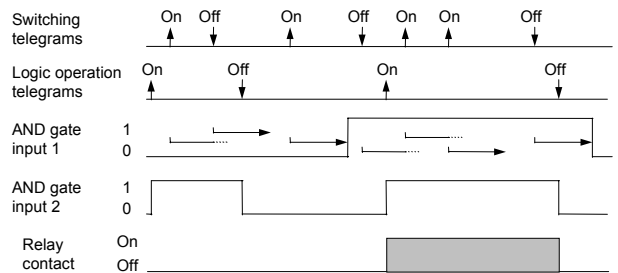
6. Switching with AND function, no time delays, relay mode: normally open contact



7. Switching with OR function, with an On delay, relay mode: normally open contact



8. Switching with AND function, with On and Off delay, relay mode: normally open contact



9. Switching with OR function and time switch function, relay mode: normally open contact

