Product manual

Mylos KNX
Switch Actuator 16A
2CSYK1101C/S

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ABB

1   Technical features

The one-channel 16A Switch Actuator is a flash-mounted device for the ABB's Mylos Building Automation system.

On the rear side, the device has an exchange output contact (NA/NC) that can be configured for the control of different kinds of loads. These contacts need additional power supply. For the simple output it is possible to control the following functions separately:

- Time, delay, ON/OFF functions;
- Stairlights with pre-warning and adjustable time for stairway lighting functions;
- Scene control through 8 bit /1 bit controls
- AND, OR, XOR logic operation and gate function.

1.1   Technical data

Power supply	- Operating voltage	21…30 VDC over the bus
	- Absorbed power EIB / KNX	< 12 mA
Nominal output values	- Number of voltage-free contacts	1 exchange contact
	- Rated voltage U_n	240/400 VAC (50/60Hz)
	- Rated current I_n (per output)	16A
	- Mechanical contacts duration	$>5*10^6$
	- Number of relay changes of position to the minimum	40
Connections	- EIB / KNX	Connection terminal Bus 0.6-0.8 mm ø, unipole
	- Load circuit	Screw terminals
	- Connection cable cross section	0,2….2,5 mm² braid 0,2….4 mm² unipole
	- Tightening torque	Max. 0.5 Nm
Control and display elements EIB / KNX	- red LED and EIB / KNX button	To set the physical address
EIB / KNX voltage	- SELV 24 VDC (safety extra low voltage)	
Ambient temperature	- Use	-5 °C … + 45 °C
	- Storage	-25 °C … + 55 °C
	- Transport	-25 °C … + 70 °C
Execution	- Dimensions (H x W x D) in mm	17 x W x 15
	- Width W in mm	17
	- Mounting width in mm	7
	- Mounting depth in mm	5
Case, colour	- Plastic container, white or black	
CE marking	- acc. to EMC and Low-Voltage Directives	

Device type	Application program	Maximum number of communication objects	Maximum number of group addresses	Maximum number of associations
Switching 1c	Switching 1c 16A/1.0	12	255	255

Supplied state

The device is supplied with the physical address 1.0.1. The application program is preloaded. It is therefore only necessary to load group addresses and parameters during commissioning. However, the complete application program can be reloaded if required. A longer downtime may result if the application program is changed or after a discharge.

Assignment of the physical address

The assignment and programming of the physical address is carried out in the ETS. The device features a Programming button for assignment of the physical device address. The red Programming LED lights up, after the button has been pushed. It switches off, as soon as the ETS has assigned the physical address or the Programming button is pressed again.

Cleaning

If devices become dirty, they can be cleaned using a dry cloth or a cloth dampened with a soapy solution. Corrosive agents or solutions should never be used.

Download behaviour

Depending on the PC, which is used, the progress bar for the download may take up to one and a half minutes, before it appears, due to the complexity of the device.

Maintenance

The device is maintenance-free. No repairs should be carried out by unauthorised personnel if damage occurs, e. g. during transport and/or storage.

1.2   Connection diagram
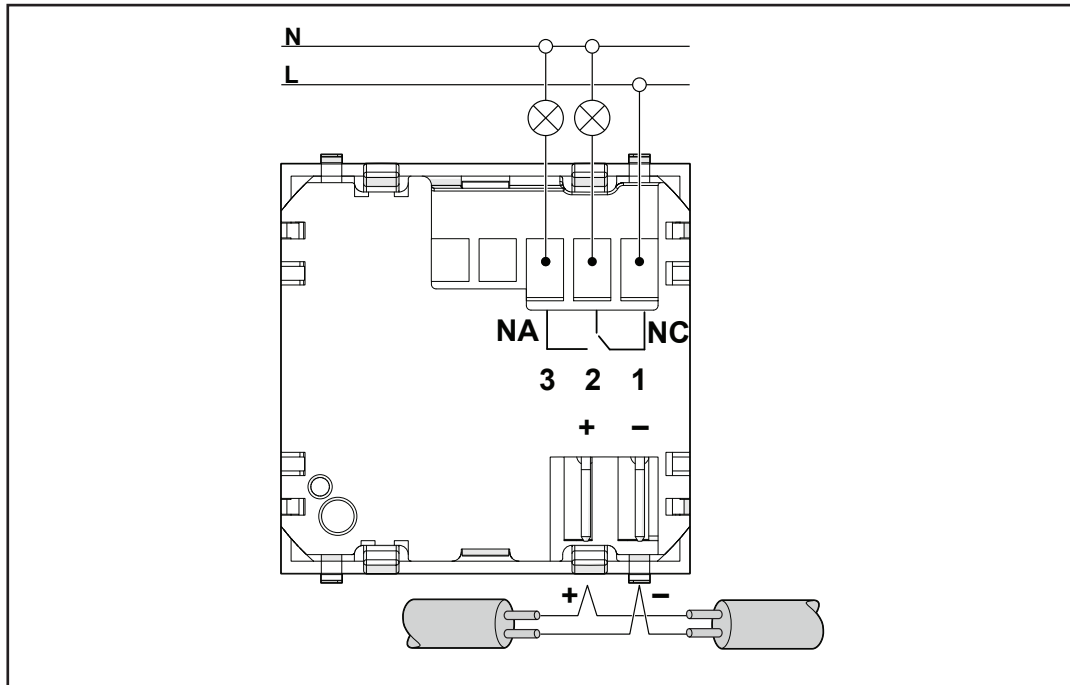
2   Commissioning

The main functions of the 16A Switch Actuator are described in this section.
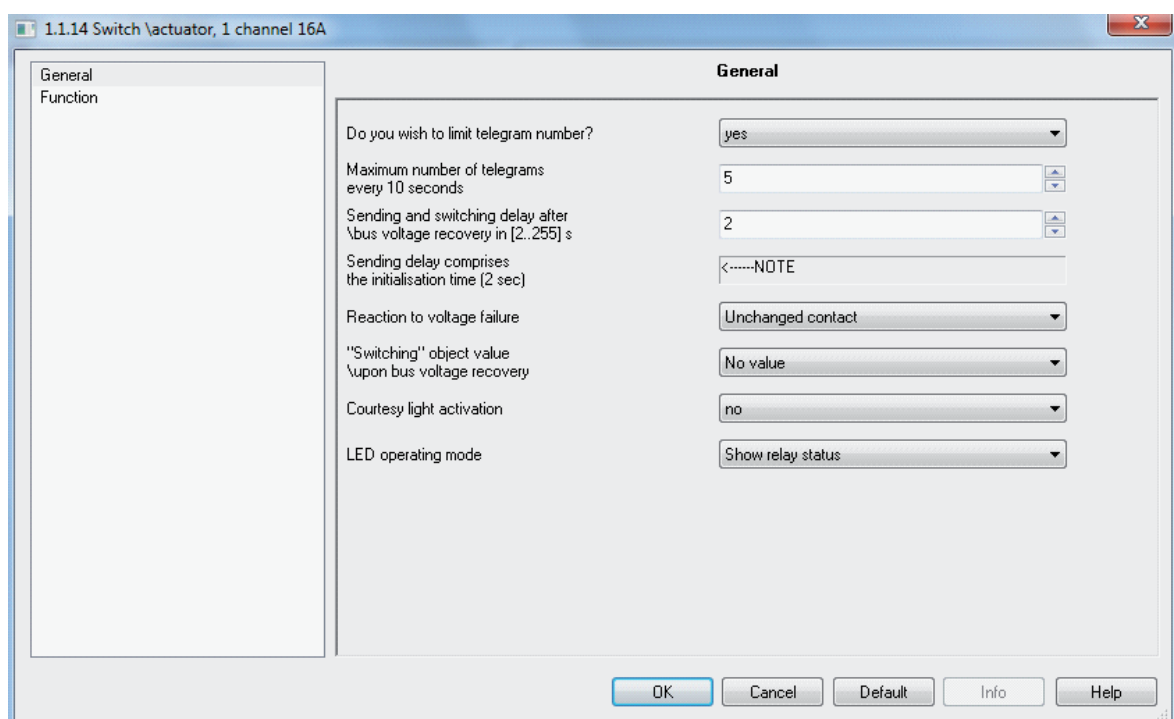The 16A Switch Actuator parametrisation is performed via the Engineering Tool ETS Software application program.
For the parametrisation you need a pc desktop or a laptop with ETS and connection to the KNX system (obtainable for example by means of RS232, USB or IP Interface).

2.1   Parameters

2.1.1   General

Do you wish to limit the number of telegrams?
It is possible to define the maximum number of unchanged telegrams during a time interval. This parameter is important upon bus voltage restoration since many devices can send their status at the same time.

Maximum number of telegrams every 10 seconds (if you wish to limit the telegram number it is set on Yes)
Maximum number of telegrams that can be sent by the device within 10 seconds.

Sending and switching delay after bus voltage restoration in [2..255] s
The delay determines the time that elapses between bus voltage restoration and the first moment in which telegrams can be sent and the relay can be switched. Initialisation time – reaction time of about 2 seconds until the processor is fully operation – it is already included in the delay time.

Reaction upon voltage failure
Through this parameter, the output can assume a definite status when a bus voltage failure occurs.

The following operation modes are available:
Options:
- **Unchanged contact**
- Open contact
- Closed contact

Switching object value upon bus voltage restoration
With this parameter you can affect the output upon bus voltage restoration using the "Switching" object value.
The "Switching" object can be written with '0' or '1' when bus voltage is restored. The contact position is determined again and the device parametrisation function is set.
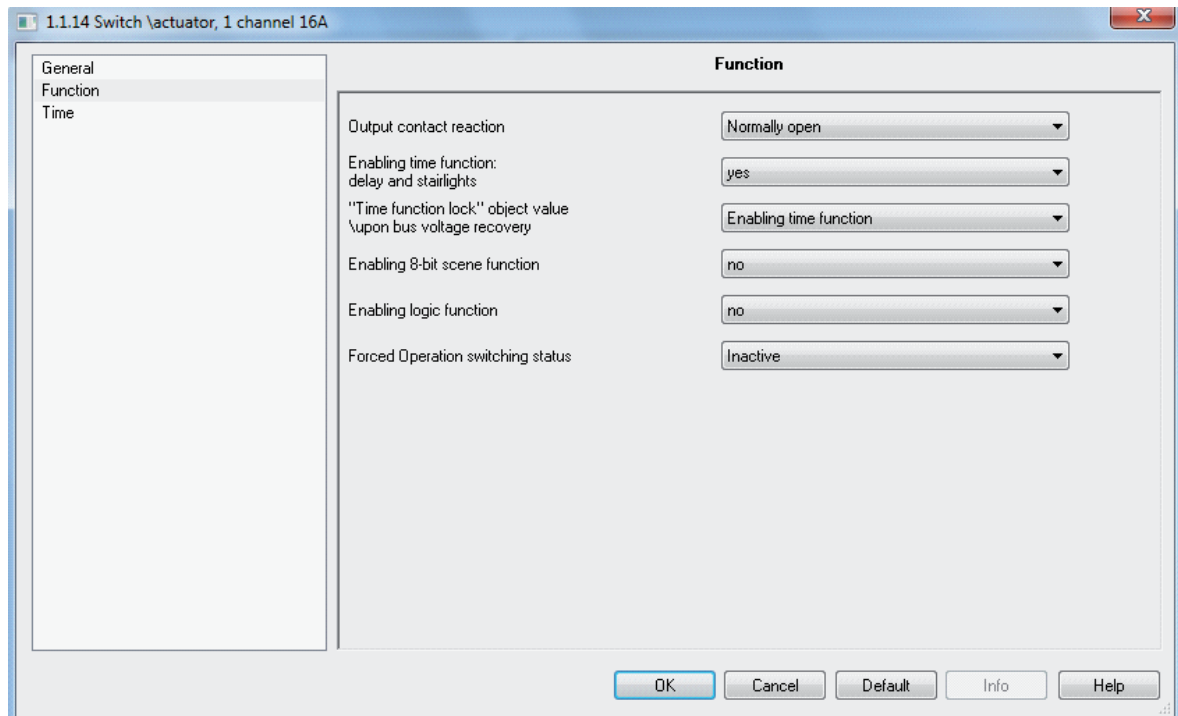
Courtesy light activation
Selecting "Yes" courtesy lights are activated

LED operating mode
It is possible to adjust the status of LEDs to that of the relay ("Show relay status"), to the "LED" communication object value ("Show communication object value") or to keep them always on or always off ("Always on" "Always off" respectively).

2.2   Function

Output contact reaction
With this parameter you can determine whether the output works as a "Normally closed contact" or as a "Normally open contact"
Options:
-   **Normally open contact**
-   Normally closed contact

Enabling time functions: delay and stairlights
This parameter enables the following time functions: Delay upon switching on and switching off, stairlights.
The "Time" parameter window is activated with a "yes" setting. With "no" the window will be locked and not visible.
When the time function is activated, the "Time function lock" communication object is enabled. With this 1 bit object it is possible to enable ("0") or lock ("1") the delay time upon switching on or off and stairlight functions, over the bus. As long as the time function is locked, the output can be activated or deactivated only without delay, by means of the "Switching" object. If a time function is enabled and subsequently disabled using "time function lock" the output position remains unchanged. A switching command through the "Switching" communication object determines an immediate switching.
"Time function lock" object value upon bus voltage restoration.
This parameter is visible only if a time function is activated.
Selecting "1", i.e. "time function lock", time functions for the delay and stairlights are disabled. They can be enabled only through the "Time function lock" object. Selecting "0", i.e. "time function unlock", the time function is enabled and active after bus voltage restoration.

"Enable scene function (8 Bit)" parameter
The "8-Bit scene" object is enabled through this parameter.

Options:
- **no**
- yes

The scene parametrisation for the X output is implemented in the "X: Scene" parameter window, which is enabled with the option "yes".
With "no" the parameter window will be locked and not visible.

Parameter "Enable logic function"
This parameter enables the "Logic".

Options:
- **no**
- yes

The parametrisation for the X output is implemented in the "X: Logic" parameter window, which is enabled with the option "yes". The parameter window remains active when the setting is "no".

Forced operation switching status
Forced operation refers to the safety 1 bit or 2 bit "Forced operation" object of X output that is available for each output.

Options:
- **inactive**
- unchanged via 1 bit object
- ON via 1 bit object
- OFF via 1 bit object
- switching status via 2 bit object

With the option "inactive" the object "forced operation" is not visible and the forced operation function is not active. The options "unchanged via 1 bit object", "ON, via 1 bit object" and "OFF, via 1 bit object" refer to the 1 bit "Forced operation" safety object and determine the output switching status during forced operation.

A "Forced operation" 2 bit object is enabled with the option "switching status via 2 bit object". The telegram value that is sent via the 2 bit object determines how it follows switch position:

Value	Bit 1	Bit 0	Access	Description
0	0	0	Free	If the "Forced operation" object receives a telegram with value "0" (00 binary) or "1"
1	0	1	Free	(01 binary), the output is enabled and can be operated through different objects.
2	1	0	OFF forced	If the "forced operation" object receives a telegram with value "2" (10 binary) or "1", the terminal output is switched off and remains disabled until forced operation is deactivated again. It is not possible to operate using another object as long as the forced operation is active. The output status can be programmed at the end of the forced operation.
3	1	1	ON forced	If the "forced operation" object receives a telegram with value "3" (11 binary), the terminal output is switched on and remains disabled until forced operation is deactivated again. It is not possible to operate using another object as long as the forced operation is active. The output status can be programmed at the end of the forced operation.

Forced operation upon bus voltage restoration

This parameter is visible only if the forced operation is activated.
Depending on whether the forced operation object is a 1 bit or 2 bit object, two different types of programming are available:

Options for 1 bit:
- **inactive**
- active

The "active" selection keeps the forced operation active after bus voltage restoration. The output switching position is defined by the "Contact switching status in forced operation" programming.
With the selection "inactive" the forced operation is disabled and the output works as if it were programmed with the "Behaviour upon safety end" parameter.

Options for 2 bit:
- **"0" inactive**
- "2" OFF
- "3" ON

Selecting "'2' OFF" causes the "forced operation" object to be written with the "2" value and the output to be deactivated.
Selecting "'3' ON" causes the "forced operation" object to be written with the "3" value and the output to be activated.

With the selection "inactive" the forced operation is disabled and the output works as if it were programmed with the "Behaviour upon safety end" parameter.

2.3   Time - Stairlights
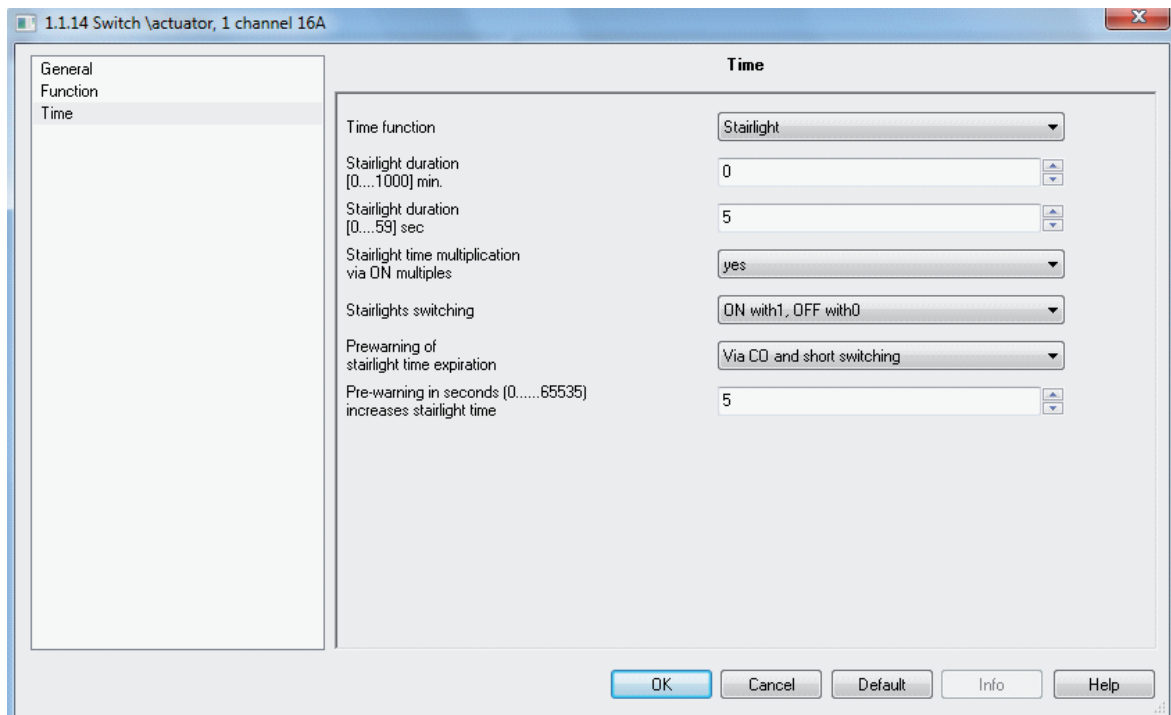

"Time function" parameter
This parameter defines the type of output time function.

Options:
  - **Stairlight function**
  - Delay ON/OFF
  - Flashing

"Stairlight function" selection
The stairlight function is activated via the switch on the "Switching" communication object telegram of X output. The communication object value can be programmed. The stairlight time starts as soon as the lights are turned on. They are immediately turned off when the stairlight time has elapsed, unless a pre-warning time has been set. If pre-warning time and stairlight time are different from "0", the stairlight time is extended with the pre-warning time.

Note: "Active" means that a "normally open" contact is closed or a "normally closed" contact is opened.
Note: The stairlight function can be recalled from the "Switching" object, "Logic gate x" or from a bright scene call.
Note: The stairlight function can be disabled by a telegram on the "Block time function" object. This function can be programmed in the "X: function" parameter window with a time function activated after a bus voltage failure.

"Stairlight time" parameter Minutes (0...1.000), Seconds (0...59)"
The operation time defines for how long the stairlights stay on after an ON command. Two parameters are available for entering the time in minutes and seconds:

Options:
Minutes
  - 0
  - ...
  - 5
  - ...
  - 1.000

Seconds
  - 0
  - ...
  - 59

If the pre-warning time is different from "0", the stairlight time is extended with the pre-warning time.

"Stairlight time increases by means of multiple ON" parameter
If during stairlight time a further ON telegram is received, the remaining stairlight time can be extended with an additional time.
This is possible until the maximum time has been reached. The maximum time can be programmed and set as 1, 2, 3, 4 or 5 times the stairlight time. If a part of the "increased" time has elapsed, it is taken back to the maximum value. However it is not possible to exceed the maximum parametrised time. The pre-warning time is not modified by the "increasing" action.

Options:
  - **no**
  - max. up to 1x stairlight time
  - max. up to 2x stairlight time
  - max. up to 3x stairlight time
  - max. up to 4x stairlight time
  - max. up to 5x stairlight time

With the "no" setting, a switching telegram ON is simply ignored.
The stairlight time passes without modifications until it is over.
If a simple boot function is required, "max. until 1x stairlight time" must be set. In this case the stairlight time is reset by a new switching ON command on the telegram and it restarts from the beginning.

"Switchable stairlights" parameter
Here you can set the value of the telegram to be used for switching stairlight on and off in advance.

Options:
  - **ON with "1" and OFF with "0"**
  - ON with "1" no action with "0"
  - ON with "0" or "1", switching off not possible

With the option "ON with '0' or '1', switching off not possible" the stairlight function is activated independently from the incoming telegram value. In this case the advance switching off is not possible.

"Pre-warning before the stairlight end" parameter
Before stairlight time elapses, the user can be warned that the lights are about to be turned off.
If the pre-warning time is different from "0", the stairlight time is extended with the pre-warning time. The pre-warning time is not modified by the "increasing" action. With the option "no", no pre-warning is given to the user and the stairlights switch off immediately after the stairlight time has elapsed. If the stairlights are turned off in advance (for example using a switching command) there is no pre-warning.

Options:
- **no**
- via object
- via quick OFF/ON switching
- via object and ON/OFF switching

There are two types of pre-warning:
- The "Stairlight pre-warning telegram" object is set at "1" at the beginning of the pre-warning time and remains unchanged until the pre-warning time has elapsed. The object can be used, for example, to switch an indicator light on.
- Switching the output (briefly OFF and ON again).

Both possibilities can be used individually or can be combined. The duration time between OFF and ON is approximately 1 second. This time is extended when more than x switching operations are carried out in a minute and for each device. Please refer to the technical data of chapter 2.

If the pre-warning time is different from "0", the stairlight time is extended with the pre-warning time.

"Pre-warning time in sec. (0...65.535) to add to stairlight duration" parameter
This parameter is visible if a pre-warning is programmed for the stairlight time function. The "pre-warning time" must be entered in seconds. The stairlight time is extended with the prewarning time.
The warning is activated during the beginning of prewarning time.

Options:
- 0
- ...
- **45**
- ...
- 65.535

2.4   Time - On/off delay
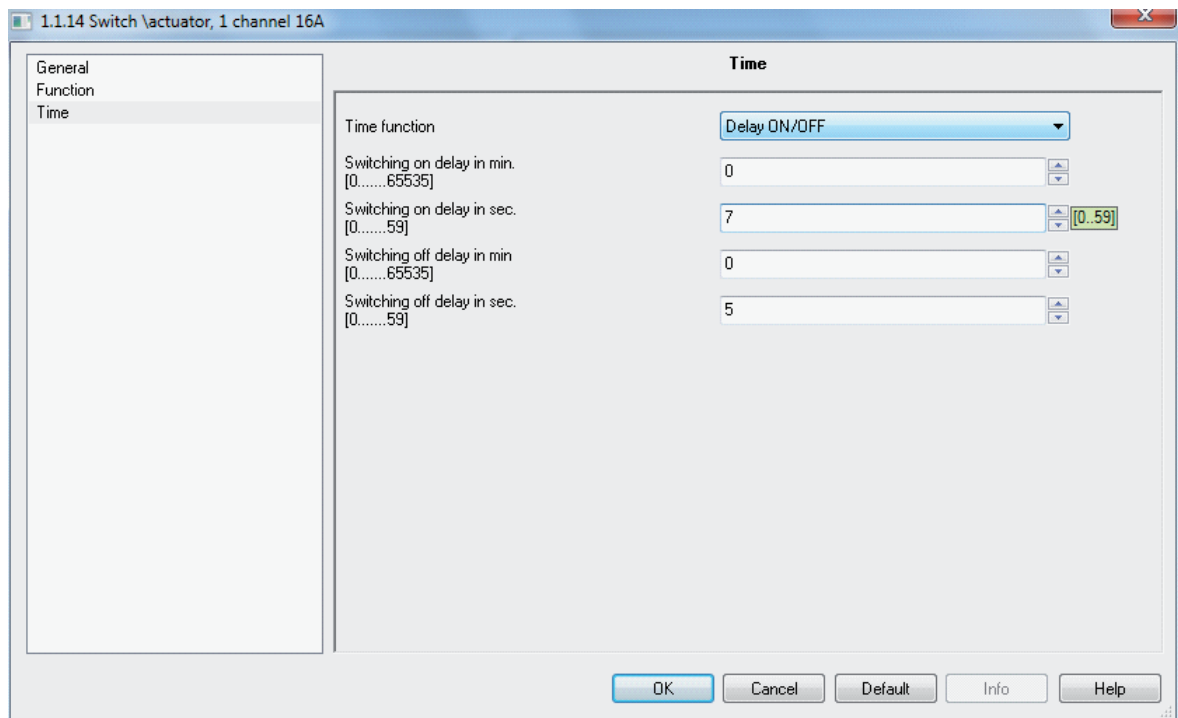
"Delayed ON: Min. (0…65.535)" parameter
Here you set the time in minutes by which the switching on command is delayed. The time can be entered in minutes and in seconds (see the following parameter).

Options:
- 0
- ...
- 65,535 minutes

"Delayed ON: Sec. (0…59)" parameter
Here you set the time in seconds by which the switching on command is delayed. The time can be entered in minutes and in seconds (see the previous parameter).

Options:
- 0
- ...
- 59 seconds

"Delayed OFF: Min. (0…65.535)" parameter
Here you set the time in minutes by which the switching off is delayed after a switching off command. The time can be entered in minutes and in seconds (see the following parameter).

Options:
- 0
- ...
- 65,535 minutes

"Delayed OFF: Sec. (0...59)" parameter
Here you set the time in seconds by which the switching off is delayed after a switching off command. The time can be entered in minutes and in seconds (see the previous parameter).

Options:
- 0
- ...
- 59 seconds

2.5   Scenes
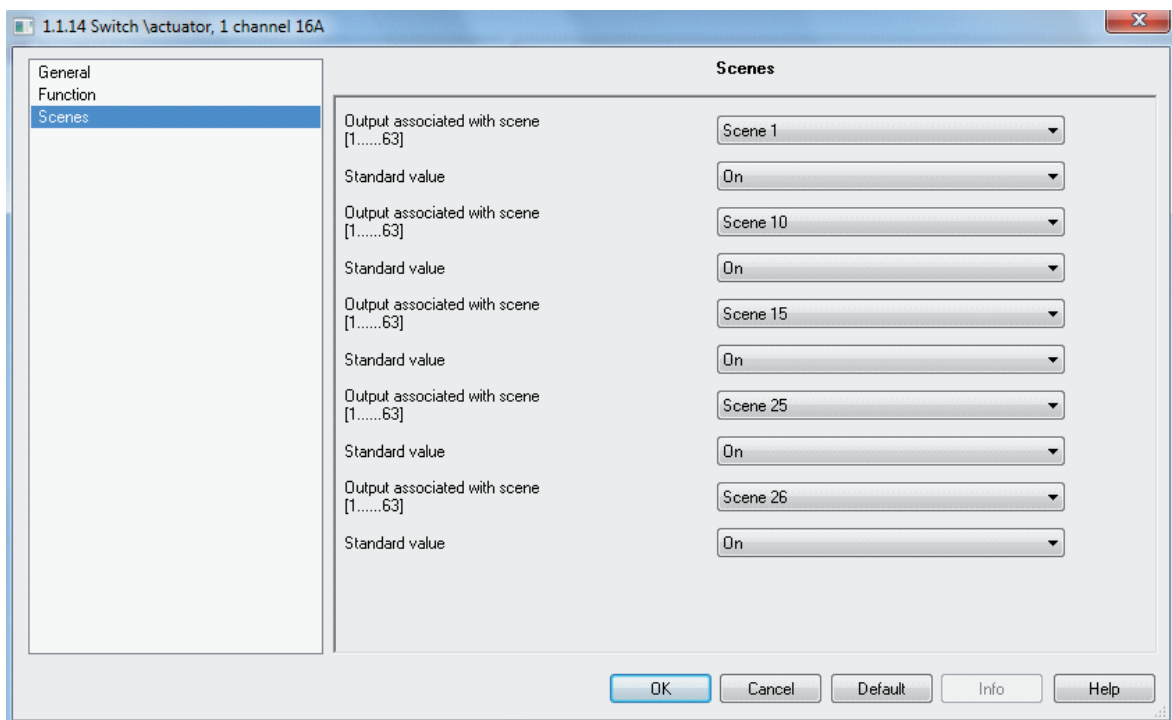
The scene function is enabled in the "Function" parameter window.
Scene values can be set (stored) over the bus. In the "General" parameter window you can determine that the values set in the ETS are transferred in the Switch Actuator during download. In this mode the values stored in the terminal are overwritten and lost.

"Associate output with (Scene 1...63)" parameter
The output can be associated with 63 different bright scenes using a group address.
The output can be associated with 5 bright scenes as a slave output.

Options:
  - **no scene**
  - Scene 1
  - ...
  - Scene 63

"Standard value" parameter
Here you set the status that the output assumes when the scene is recalled.

Options:
  - **ON**
  - OFF

When a scene is stored, the user has the possibility to modify the value that has been parametrised here. The stored scene values are lost if the bus voltage fails. The values programmed in the ETS are recovered upon bus voltage restoration.

Note: When a scene is recalled
  - the time functions start from scratch
  - the logic operations are evaluated again

2.6   Logic function
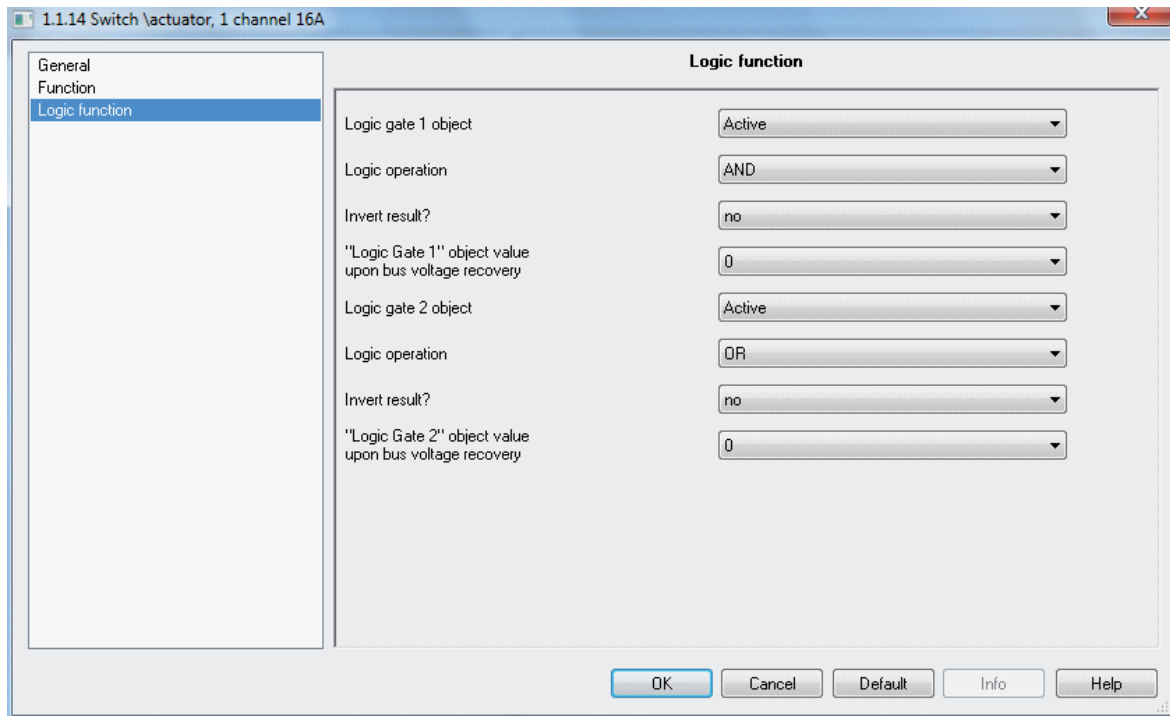
For each output the logic function makes up to two logic objects available, that are logically connected to the "Switching" communication object.

The parameter window is enabled in "Function".

When receiving an object value, the logic function is always recalculated. First of all the "Logic gate 1" object is evaluated with the "Switching" object. The result is connected to the object "Logic gate 2".

See section 4.2.3. for explanations of the logic function.

Please examine the chart of operation of section 4.2.1.

"Logic gate x object" parameter (x = 1, 2)
The object "Logic gate 1" or "Logic gate 2" is enabled with this parameter.

Options:
- **inactive**
- active

"Logic gate x object function" parameter (x = 1, 2)
Here the logic function of the "Logic gate x" object is defined together with the "Logic gate x". Three standard operators are available (AND, OR, XOR). The gate function is also available to lock switching commands. Setting the "Logic gate x object" parameter to "not active", the logic function is disabled.

Options:
- AND
- OR
- XOR
- Gate function

2.7   Operation of communication objects "Switch Actuator"

	No.	Function	Object name	Type of datum	Flags
0	Output A	Switching	1 bit	C - W - -	1 bit DPT_Swi...	Low
1	Output A	Time function lock	1 bit	C - W - -	1 bit DPT_Ena...	Low
2	Output A	Forced operation	1 bit	C - W - -	1 bit DPT_Swi...	Low
3	Output A	Scenes	1 Byte	C - W - -		Low
4	Output A	Switching status	1 bit	C R - T -	1 bit DPT_Bool	Low
5	Output A	Stairlight pre-warn.	1 bit	C - - T -	1 bit DPT_Ena...	Low
6	Output A	Logic gate 1	1 bit	C - W - -	1 bit DPT_Bool	Low
7	Output A	Logic gate 2	1 bit	C - W - -	1 bit DPT_Bool	Low
8	Output A	LED	1 bit	C - W T U	1 bit DPT_Swi...	Low
9	Output A	Disabling LED	1 bit	C - W T -	1 bit DPT_Ena...	Low

No.	Function	Object name	Type of datum	Flags
0	**Switching**	**Output A**	**1 bit (EIS 1) DPT 1.001**	**C, W**

This object is used to switch an output ON/OFF.
The device receives a switching command via the communication object. If the output is programmed as "normally open" contact, the relay is closed with a "1" telegram value and opened with a "0" telegram value (and the opposite is true when it is programmed as "normally open" contact).

Note: With logic or forced operations, a change in the communication object does not automatically lead to a change in contact position. Please refer to the chart of operation of section 4.2.1.

No.	Function	Object name	Type of datum	Flags
1	**ON fixed**	**Output A**	**1 bit (EIS 1) DPT 1.001**	**C, W**

This object is visible if the time function in the "Function" parameter window has been activated.
If the value "1" is assigned to the object, the output is activated independently of the "Switching" object value and remains active until the "ON fixed" object has a "0" value.
At the end of the ON fixed status, the "Switching" communication object status is used to update the contact status based on device settings (see the chart of operation of paragraph 4.2.1).
The stairlight function behaviour after an ON fixed is programmed in the "Time" parameter window.
This object can be used, for example, to allow the guardian, housekeeping staff or maintenance personnel to activate an ON fixed.

No.	Function	Object name	Type of datum	Flags
2	**Forced operation**	**Output A**	**1 bit (EIS 1) DPT 1.003**	**C, W**

This object is visible if in the "Function" parameter window the "Switching status in forced operation" has been selected as 1 bit object.
If this object contains the value "1", the output is forcedly set at the programmed switching position that has been configured in the "Function" parameter window. The forced contact position continues until the end. This happens if a "0" is received via the "Forced operation" object.
It is important to note that the function "Priority 1 Safety " and bus faults have a highest priority over the communication status.
See the chart of operation of section 4.2.1.

No.	Function	Object name	Type of datum	Flags
2	**Forced operation**	**Output A**	**2 bit (EIS 8) DPT 2.001**	**C, W**

This object is visible if in the "Function" parameter window the "Switching status in forced operation" has been selected as 2 bit object.
The output can be controlled forcedly using this object (for example an upper level control). The object value defines the contact forced position.
- "0" or "1": The output is not switched forcedly
- "2": The output is switched forcedly on OFF
- "3" : The output is switched forcedly on ON

1	**ON fixed**	**Output A**	**1 bit (EIS 1) DPT 1.001**	**C, W**

Using this 8 bit communication object it is possible to send a scene command with a coded telegram.
The telegram contains the corresponding scene number and the indication about whether the scene has to be recalled or the current switching status must be assigned to it.
The communication object is visible only if the output X in the "Function" parameter window is assigned to at least a 8 bit scene.

Telegram size (1 byte):
- MXSSSSSS
- (MSB) (LSB)

M:
- 0 – the scene is recalled
- 1 – the scene is stored (if permitted)

X:
- not used

S:
- Scene number (1 ... 64: 00000000 ... 00111111)

Value of the 1 byte EIB / KNX telegram		Meaning
decimal	**hexadecimal**	
00 or 64	00h or 40h	Recall scene 1
01 or 65	01h or 41h	Recall scene 2
02 or 66	02h or 42h	Recall scene 3
...	...	...
63 or 127	3Fh or 7Fh	Recall scene 64
128 or 192	80h or B0h	Store scene 1
129 or 193	81h or B1h	Store scene 2
130 or 194	82h or B2h	Store scene 3
...	...	...
191 or 255	AFh or FFh	Store scene 64

4	**Switching status**	**Output A**	**1 bit (EIS 1) DPT 1.002**	**C, R, T**

This object is always visible.
The object value indicates the relay contact position.

5	**Stairlight pre-warning**	**Output A**	**1 bit (EIS 1) DPT 1.003**	**C, T**

This object will be visible if the time function in the "X: Time" parameter window and a pre-warning object via the "Pre-warning before stairlight end" parameter are selected. The object value is programmable and gives a pre-warning before the stairlights are turned off.
For example, during stairlights switching on, until the beginning of pre-warning time, a "0" can be sent to this object and at the moment of pre-warning a "1" can be sent. In this way it is possible to activate a pre-warning.

6	**Logic gate 1**	**Output A**	**1 bit (EIS 1) DPT 1.002**	**C, W**

The object is visible if the logic function has been enabled in the parameter window "X: Function". The output X can be assigned to the first of two logic objects. The logic operation should be defined in the parameter window "X: Logic".
The communication object is first of all connected to the object "Logic gate 1". The result is connected to the object "Logic gate 2".
An example with chart of operation can be found in section 4.2.3.

7	**Logic gate 2**	**Output A**	**1 bit (EIS 1) DPT 1.002**	**C, W**
With this object the output X can be assigned to the second logic function. The logic operation should be defined in the parameter window "X: Logic". The communication object is first of all connected to the object "Logic gate 1". The result is connected to the object "Logic gate 2". An example with chart of operation can be found in section 4.2.3.				

For the "Blind" operating mode:

No.	Function	Object name	Type of datum	Flags
8	**LED**	**Output A**	**1 bit (EIS 1) DPT 1.002**	**C, W, T, U**
Through this communication object it is possible to control the LED status directly over the bus. Send a telegram containing the value 1 to switch it on, or value 0 to switch it off.				
9	**Disabling LED**	**Output A**	**1 bit (EIS 1) DPT 1.002**	**C, W, T, U**
The "Disabling Led" communication object makes it possible to enable (1) the LED so as that it switches on or off depending on the operating mode selected from the parameters or to disable it (0) forcing it into a continuous switching off status.				

3   Table of 8 bit scene telegram codes

8-Bit Values	Hexadecimal	Recall/Store (7)	Not defined (6)	5	4	3	2	1	0	Scene no.	Recall (A)/Store (S)
0	00	0	0	0	0	0	0	0	0	1	A
1	01	0	0	0	0	0	0	0	1	2	A
2	02	0	0	0	0	0	0	1	0	3	A
3	03	0	0	0	0	0	0	1	1	4	A
4	04	0	0	0	0	0	1	0	0	5	A
5	05	0	0	0	0	0	1	0	1	6	A
6	06	0	0	0	0	0	1	1	0	7	A
7	07	0	0	0	0	0	1	1	1	8	A
8	08	0	0	0	0	1	0	0	0	9	A
9	09	0	0	0	0	1	0	0	1	10	A
10	0A	0	0	0	0	1	0	1	0	11	A
11	0B	0	0	0	0	1	0	1	1	12	A
12	0C	0	0	0	0	1	1	0	0	13	A
13	0D	0	0	0	0	1	1	0	1	14	A
14	0E	0	0	0	0	1	1	1	0	15	A
15	0F	0	0	0	0	1	1	1	1	16	A
16	10	0	0	0	1	0	0	0	0	17	A
17	11	0	0	0	1	0	0	0	1	18	A
18	12	0	0	0	1	0	0	1	0	19	A
19	13	0	0	0	1	0	0	1	1	20	A
20	14	0	0	0	1	0	1	0	0	21	A
21	15	0	0	0	1	0	1	0	1	22	A
22	16	0	0	0	1	0	1	1	0	23	A
23	17	0	0	0	1	0	1	1	1	24	A
24	18	0	0	0	1	1	0	0	0	25	A
25	19	0	0	0	1	1	0	0	1	26	A
26	1A	0	0	0	1	1	0	1	0	27	A
27	1B	0	0	0	1	1	0	1	1	28	A
28	1C	0	0	0	1	1	1	0	0	29	A
29	1D	0	0	0	1	1	1	0	1	30	A
30	1E	0	0	0	1	1	1	1	0	31	A
31	1F	0	0	0	1	1	1	1	1	32	A
32	20	0	0	1	0	0	0	0	0	33	A
33	21	0	0	1	0	0	0	0	1	34	A
34	22	0	0	1	0	0	0	1	0	35	A
35	23	0	0	1	0	0	0	1	1	36	A
36	24	0	0	1	0	0	1	0	0	37	A
37	25	0	0	1	0	0	1	0	1	38	A
38	26	0	0	1	0	0	1	1	0	39	A
39	27	0	0	1	0	0	1	1	1	40	A
40	28	0	0	1	0	1	0	0	0	41	A
41	29	0	0	1	0	1	0	0	1	42	A
42	2A	0	0	1	0	1	0	1	0	43	A
43	2B	0	0	1	0	1	0	1	1	44	A
44	2C	0	0	1	0	1	1	0	0	45	A
45	2D	0	0	1	0	1	1	0	1	46	A
46	2E	0	0	1	0	1	1	1	0	47	A
47	2F	0	0	1	0	1	1	1	1	48	A
48	30	0	0	1	1	0	0	0	0	49	A
49	31	0	0	1	1	0	0	0	1	50	A
50	32	0	0	1	1	0	0	1	0	51	A
51	33	0	0	1	1	0	0	1	1	52	A
52	34	0	0	1	1	0	1	0	0	53	A
53	35	0	0	1	1	0	1	0	1	54	A
54	36	0	0	1	1	0	1	1	0	55	A
55	37	0	0	1	1	0	1	1	1	56	A
56	38	0	0	1	1	1	0	0	0	57	A
57	39	0	0	1	1	1	0	0	1	58	A
58	3A	0	0	1	1	1	0	1	0	59	A
59	3B	0	0	1	1	1	0	1	1	60	A
60	3C	0	0	1	1	1	1	0	0	61	A
61	3D	0	0	1	1	1	1	0	1	62	A
62	3E	0	0	1	1	1	1	1	0	63	A
128	80	1	0	0	0	0	0	0	0	1	S
129	81	1	0	0	0	0	0	0	1	2	S
130	82	1	0	0	0	0	0	1	0	3	S
131	83	1	0	0	0	0	0	1	1	4	S
132	84	1	0	0	0	0	1	0	0	5	S
133	85	1	0	0	0	0	1	0	1	6	S
134	86	1	0	0	0	0	1	1	0	7	S
135	87	1	0	0	0	0	1	1	1	8	S
136	88	1	0	0	0	1	0	0	0	9	S
137	89	1	0	0	0	1	0	0	1	10	S
138	8A	1	0	0	0	1	0	1	0	11	S
139	8B	1	0	0	0	1	0	1	1	12	S
140	8C	1	0	0	0	1	1	0	0	13	S
141	8D	1	0	0	0	1	1	0	1	14	S
142	8E	1	0	0	0	1	1	1	0	15	S
143	8F	1	0	0	0	1	1	1	1	16	S
144	90	1	0	0	1	0	0	0	0	17	S
145	91	1	0	0	1	0	0	0	1	18	S
146	92	1	0	0	1	0	0	1	0	19	S
147	93	1	0	0	1	0	0	1	1	20	S
148	94	1	0	0	1	0	1	0	0	21	S
149	95	1	0	0	1	0	1	0	1	22	S
150	96	1	0	0	1	0	1	1	0	23	S
151	97	1	0	0	1	0	1	1	1	24	S
152	98	1	0	0	1	1	0	0	0	25	S
153	99	1	0	0	1	1	0	0	1	26	S
154	9A	1	0	0	1	1	0	1	0	27	S
155	9B	1	0	0	1	1	0	1	1	28	S
156	9C	1	0	0	1	1	1	0	0	29	S

8-Bit Values	Hexadecimal	Recall/Store (7)	Not defined (6)	5	4	3	2	1	0	Scene no.	Recall (A)/Store (S)
157	9D	1	0	0	1	1	1	0	1	30	S
158	9E	1	0	0	1	1	1	1	0	31	S
159	9F	1	0	0	1	1	1	1	1	32	S
160	A0	1	0	1	0	0	0	0	0	33	S
161	A1	1	0	1	0	0	0	0	1	34	S
162	A2	1	0	1	0	0	0	1	0	35	S
163	A3	1	0	1	0	0	0	1	1	36	S
164	A4	1	0	1	0	0	1	0	0	37	S
165	A5	1	0	1	0	0	1	0	1	38	S
166	A6	1	0	1	0	0	1	1	0	39	S
167	A7	1	0	1	0	0	1	1	1	40	S
168	A8	1	0	1	0	1	0	0	0	41	S
169	A9	1	0	1	0	1	0	0	1	42	S
170	AA	1	0	1	0	1	0	1	0	43	S
171	AB	1	0	1	0	1	0	1	1	44	S
172	AC	1	0	1	0	1	1	0	0	45	S
173	AD	1	0	1	0	1	1	0	1	46	S
174	AE	1	0	1	0	1	1	1	0	47	S
175	AF	1	0	1	0	1	1	1	1	48	S
176	B0	1	0	1	1	0	0	0	0	49	S
177	B1	1	0	1	1	0	0	0	1	50	S
178	B2	1	0	1	1	0	0	1	0	51	S
179	B3	1	0	1	1	0	0	1	1	52	S
180	B4	1	0	1	1	0	1	0	0	53	S
181	B5	1	0	1	1	0	1	0	1	54	S
182	B6	1	0	1	1	0	1	1	0	55	S
183	B7	1	0	1	1	0	1	1	1	56	S
184	B8	1	0	1	1	1	0	0	0	57	S
185	B9	1	0	1	1	1	0	0	1	58	S
186	BA	1	0	1	1	1	0	1	0	59	S
187	BB	1	0	1	1	1	0	1	1	60	S
188	BC	1	0	1	1	1	1	0	0	61	S
189	BD	1	0	1	1	1	1	0	1	62	S
190	BE	1	0	1	1	1	1	1	0	63	S

Notes

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