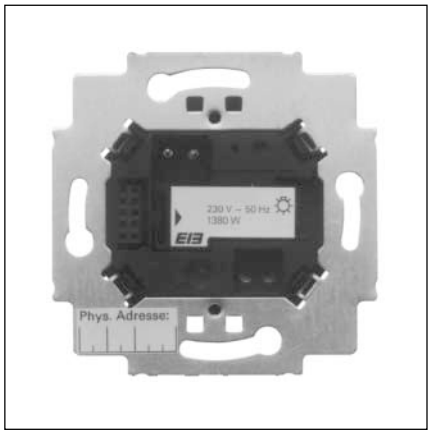
ABB i-bus® EIB

1-fold switch actuator/sensor, FM
Type: 6110 U-101-500



The switch actuator/sensor is intended for installation in a 60 mm flush-mounted box in accordance with DIN 49073.

The device has a relay that is controlled via the EIB. It makes it possible to switch electrical loads (e.g. luminaires).

For local control, various application modules (e.g. switch sensors, motion detectors, IR interfaces) can be connected.

Depending on the application program, telegrams can also be sent to other EIB devices.

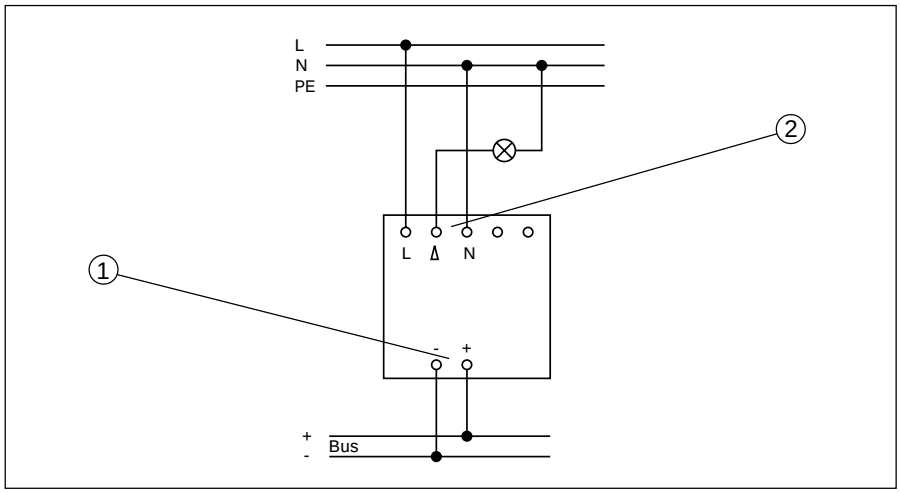
Technical Data

Power supply	– EIB	24 V DC, via the bus line
Outputs	– 1 floating contact	
	– Switching voltage	230 V AC, 50 Hz
	– Switching capacity	10 Ax
Connections	– EIB	Pins for bus connecting terminal
	– Application module	10-pole socket connector
	– Load circuit	Screw terminals Wire range 1 … 2.5 mm²
Operating and display elements	– LED and push button	for assigning the physical address
Type of protection	– IP 20, EN 60 529 with application module mounted on top	
Ambient temperature range	– Operation	- 5 °C … 45 °C
	– Storage	-25 °C … 55 °C
	– Transport	-25 °C … 70 °C
Design	– Flush-mounted device	
Housing, colour	– Plastic housing, black	
Mounting	– in 60 mm flush-mounted box, screw fixing using a retaining ring	
Dimensions	– Unit	48 x 44 x 35 mm (H x W x D)
	– Retaining ring	71 x 71 mm
Weight	– 0.08 kg	
Certification	– EIB-certified	
CE norm	– in accordance with the EMC guideline and the low voltage guideline	

Application programs	Number of communication objects	Max. number of group addresses	Max. number of associations
For **Switch actuator/ -sensor without operation element**:			
Switch Logic Stairc.fct Time Status /3	3	12	12

Note:
Please take the application programs for the *alpha*, solo® and Busch-triton® switch sensors from the table on the next page.

Circuit diagram



1 Bus connection

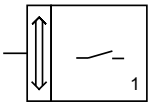
2 Mains voltage connection

Application programs	Number of communication objects	Max. number of group addresses	Max. number of associations
For ***alpha* 1-fold Switch sensor**:			
Switch Logic Priority Status Stairc.fct /1	3	8	8
For ***alpha* 2-fold Switch sensor**:			
Switch LED /5	8	12	12
Switch Dim /4	3	7	7
Switch Shutter /9.1	3	7	8
Switch Edge Flexible allocation /5.1	4	12	12
For ***alpha* 4-fold Switch sensor**:			
Switch LED /6	8	12	12
For ***alpha* Watchdog sensor 180 Comfort**:			
Switch Value Cyclic Monitoring Threshold /1	12	21	21
For ***alpha* Infrared interface**:			
Switch /12	9	9	9
For **solo® 1-fold Switch sensor**:			
Switch sensor 1f TP/1	15	15	15
For **solo® 2-fold Switch sensor**:			
Switch sensor 2f TP/1	15	15	15
For **solo® 4-fold Switch sensor**:			
Switch sensor 4f TP/1	15	15	15
For **solo® 4-fold multi function Switch sensor**:			
Switch sensor 4f MF TP/1	22	22	22
For **solo® Watchdog sensor 180 Comfort with multi lens**:			
Switch Value Cyclic Monitoring Threshold /2	12	21	21
For **solo® 3-fold Switch sensor with IR-Receiver**:			
Switch sensor 3f IR TP/1	24	24	24

Note:
The application descriptions for the solo® switch sensors in combination with the 1-fold switch actuator/sensor FM (6110 U-101) can be found directly in the descriptions for the individual sensors, in the chapter “Flush-mounted sensors”.

Application programs	Number of communication objects	Max. number of group addresses	Max. number of associations
For **1-fold Busch-triton® switch sensor**:			
Switch Logic Priority Status Stairc.fct /2	4	7	8
For **3-fold Busch-triton® switch sensor**:			
IR Switch Dim Shu. Lightsc. LED/1.2	12	20	20
IR Switch Dim Shutter Lightscene /7	19	19	19
For **3-fold Busch-triton® switch sensor with LCD**:			
IR LCD Switch Dim Shutter Lightscene /9	19	19	19
For **5-fold Busch-triton® switch sensor**:			
IR Switch Dim Shutter Lightscene /3.2	17	19	19
IR Switch Dim Shutter LED /3.1	18	22	23
For **5-fold Busch-triton® switch sensor with LCD**:			
IR LCD Switch Dim Shutter Lightscene /1.1	18	21	21
IR LCD Switch Dim Shutter /2	18	18	18

Switch Logic Priority Status Stairc.fct /3



Selection in ETS2

– ABB
  └Switch actuator/sensor FM
    └without operating element

– ABB
  └Output
    └Binary Output, 1-fold

The application module is specifically for the flush-mounted switch actuator/ sensor without a further application module.

Switch actuator FM (6110 U-101)

The switch actuator has a 1 bit communication object “Output - Switch” which is used to switch the relay. In the default setting, the output switches on following the receipt of a telegram with the value “1” and switches off after a telegram with the value “0”. If the parameter “Behaviour of contact” is set to “normally closed contact”, the relay is closed following the receipt of a telegram with the value “0” and opened after a telegram with the value “1”.

The relay contact is opened on bus voltage failure. The behaviour of the relay contact on mains voltage recovery can be set. By default, the relay is “opened”. Further options are “closed” or “restore previous state”. If the output should carry out defined switching on/off, the actuator takes into account the parameter “Switching behaviour”.

Logic (Switch actuator FM, 6110 U-101)

With the parameter “Logic operation”, it is possible to set an AND or an OR function. In both cases, the ETS2 program displays a further 1 bit communication object “Output - ... function” for the output. The output links the values of communication objects no. 0 and no. 1 and switches the relay according to the result.

A corresponding parameter is available for preselecting a defined input signal on bus voltage recovery.

Status (Switch actuator FM, 6110 U-101)

If the parameter “Status response” is set to “yes”, the ETS2 program displays a further 1 bit communication object “Output - Status response”. This communication object sends a telegram each time the actuator is switched. The value “1” means that the relay has adopted the active state in accordance with the parameter “Behaviour of contact”.

Staircase lighting function (Switch actuator FM, 6110 U-101)

In the operation mode “Staircase lighting function”, the output is switched on immediately following the receipt of an “ON” telegram. Once the period that was set in the time base and factor parameters has elapsed, the relay is automatically opened. If the output receives further “ON” telegrams before the period has elapsed, the time restarts.

If the staircase lighting function and the logic operation are activated, the time setting only has an effect if the actuator is switched via object no. 0 “Output - Switch”.

In addition to the staircase lighting function, it is also possible to activate an ON delay. The corresponding parameter must be activated. The ON delay is again defined with a time base and factor.

Timing function (Switch actuator FM, 6110 U-101)

With the operation mode “Timing function”, it is possible to activate an ON and/or OFF delay. The two periods can be of varying lengths and are defined with a time base and factor.

The delay periods only influence the switch object. If e.g. an OR function has been selected in addition to an ON delay, the time delay is only active if an ON command is received via the switch object. If the ON command is however sent directly to the logic object, the actuator switches directly to the state that was preselected in the parameter “Behaviour of contact”.

Communication objects

No.	Type	Object name	Function
0	1 bit	Output	Switch

Communication objects
for OR connection

No.	Type	Object name	Function
0	1 bit	Output	Switch
1	1 bit	Output	AND function
2	1 bit	Output	Status response

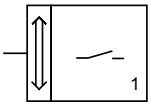
Communication objects
for AND connection

No.	Type	Object name	Function
0	1 bit	Output	Switch
1	1 bit	Output	OR function
2	1 bit	Output	Status response

Parameters
The default setting for the values is **printed in bold type.**

Switch actuator - General:	
– Behaviour of contact	**normally open contact** normally closed contact
– Contact on mains voltage recovery	**opened** closed restore previous state
Switch actuator - Operation modes:	
– Operation mode	**Normal operation** Staircase lighting function Timing function
Only for staircase lighting function:	
– ON delay	**no** yes
Only if “yes” is selected:	
– Time base for ON delay	**approx. 130 ms** / … / approx. 520 ms / … / approx. 1.2 h
– Factor for ON delay (2…127)	**10**
– Time base for staircase lighting function	**approx. 130 ms** / … / approx. 520 ms / … / approx. 1.2 h
– Factor for staircase lighting function (2…127)	**10**
Only for timing function:	
– ON delay	**no** yes
Only if “yes” is selected:	
– Time base for ON delay	**approx. 130 ms** / … / approx. 520 ms / … / approx. 1.2 h
– Factor for ON delay (2…127)	**10**
– OFF delay	**no** yes
Only if “yes” is selected:	
– Time base for OFF delay	**approx. 130 ms** / … / approx. 520 ms / … / approx. 1.2 h
– Factor for OFF delay (2…127)	**10**
– Logic operation	**no logic operation** AND function OR function
Only if a logic operation is selected:	
– Value of logic operation on mains voltage recovery	**OFF “0”** ON “1”
– Status response	**no** yes

Switch Logic Priority Status Stairc.fct /1



Selection in ETS2

– ABB
  └Push Button alpha nea
    └Push button, single for 1SA

The application program is specifically for the 1-fold switch sensor application module in connection with the flush-mounted switch actuator/sensor.

Switch

In the default setting, the output switches on when it receives a telegram with the value “1” and switches off on receipt of a telegram with the value “0”. If the parameter “Switch function” is set to “normally closed contact”, the relay opens when it receives a telegram with the value “0” and closes on receipt of a telegram with the value “1”.

If the upper rocker of the application module is pressed, the communication object no. 0 sends an “On” telegram. If the lower rocker is pressed, the object sends an “Off” telegram.

Logic

Using the parameter “Logical connection”, it is possible to specify an AND or an OR connection. In both cases the ETS2 program displays an additional communication object for the output. The output then links the values of communication objects 0 and 1 and switches the relay according to the result.

Priority

If the parameter “Additional function …” is set to “Priority”, the ETS2 program displays a further communication object. With the 2 bit communication object, the actuator can be positively driven by a primary control (e.g. application controller). There are three different states:

– The priority object has the value “3”. The value of the switching object is not important. The output is switched off through priority control.
– The priority object has the value “2”. The value of the switching object is not important. The output is switched on through priority control.
– The priority object has the value “1” or “0”. The output is not priority controlled. It is operated via the switching object.

If the actuator is priority controlled, changes to the 1 bit object are stored, even if the current switching state has not been directly changed as a result. When the priority controlled operation has finished, a switching operation takes place according to the current value of the switching object.

Status

If the parameter “Additional function …” is set to “Status display”, the ETS2 program displays a further 1 bit communication object. This communication object sends a telegram each time the actuator is switched. The value “1” means that the relay has accepted the active state in accordance with the parameter “Switch function”.

In the default setting, the LED displays the status of the relay by its change in colour. Alternatively it can as an orientation light always glow the same colour.

Staircase lighting function

In the operation mode “Staircase lighting function”, the output switches on immediately after receiving an “On” telegram. Once the time specified in the two parameters “Time base” and “Factor” has elapsed, the relay automatically opens. If the output receives further “On” telegrams during this interval, the period restarts each time.

If both a logical connection and a staircase lighting function have been assigned, the time setting only applies if the output is switched via object no. 0.

On bus voltage failure, the relay contact is opened. When the bus voltage is restored, the output can either switch in the set state or recover the state that was active prior to the failure. If the output is defined as switching on and off, the actuator takes the “Switch function” parameter into account.

Communication objects

No.	Type	Object name	Function
0	1 bit	Output / rocker	Switch / Telegr. switch

Communication objects
for OR connection

No.	Type	Object name	Function
0	1 bit	Output / rocker	Switch / Telegr. switch
1	1 bit	Output A	OR connection

Communication objects
for AND connection

No.	Type	Object name	Function
0	1 bit	Output / rocker	Switch / Telegr. switch
1	1 bit	Output A	AND connection

Communication objects
for additional function “Priority”

No.	Type	Object name	Function
…			
2	1 bit	Output A	Priority

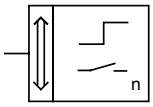
Communication objects
for additional function “Status display”

No.	Type	Object name	Function
…			
2	1 bit	Output A	Telegr. status

Parameters
The default setting for the values is **printed in bold type.**

– Switch function	**normally open contact** normally closed contact
– Operation mode	**normal operation** staircase lighting function
only for staircase lighting function:	
– Time base for staircase lighting function	130 ms / … / **520 ms** / … / 1.2 h
– Factor for staircase lighting function (2 … 127)	**8**
– Logical connection	**no logical connection** OR connection AND connection
– Additional status or priority function	**no additional function** priority status display
– Behaviour on bus voltage recovery	**recover previous state** switch on switch off
– Function of the LED	orientation light **LED indicates status of relay**
only for orientation light:	
– Colour of the LED	**green** red
only for display of relay status:	
– Colour of the LED	**“OFF” = green, “ON” = red** “OFF” = red, “ON” = green

Switch LED /5



Selection in ETS2

– ABB
  └Push Button alpha nea
    └Push button, 2-fold for 1SA

The application program is specifically for the 2-fold switch sensor application module in connection with the flush-mounted switch actuator/sensor.

The application program has two communication objects for the push buttons and two communication objects for the LEDs. One of the communication objects for the LEDs is used simultaneously for controlling the relay. This assignment can be set in the parameters.

Switch

The switch sensor sends an “On” telegram to the EIB when the upper contact of one of the rockers is pressed and an “Off” telegram when the lower contact of one of the rockeres is pressed.

LED

With the parameters “Function of the LED”, it can be determined whether the LED displays the value of the object “Left LED” or “Right LED” or as an orientation light always glows the same colour. The function “Orientation light” is not available for the LED that is linked with the relay.

If the LED is to be used as an orientation light, the ETS2 does not display the “LED” communication object.

On bus voltage failure, all the communication objects are set to “0”. The relay contact is opened.

Communication objects
when relay is linked
with the left LED

No.	Type	Object name	Function
0	1 bit	Left push button	Telegr. switch
1	1 bit	Right push button	Telegr. switch
4	1 bit	Left LED / output	Change colour / switch
5	1 bit	Right LED	Change colour

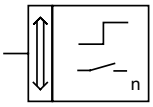
Communication objects
when relay is linked
with the right LED

No.	Type	Object name	Function
0	1 bit	Left push button	Telegr. switch
1	1 bit	Right push button	Telegr. switch
4	1 bit	Left LED	Change colour
5	1 bit	Right LED / output	Change colour / switch

Parameters
The default setting for the values is **printed in bold type.**

For the switch output:	
– Relay is linked with	**object no. 4 (left LED)** object no. 5 (right LED)
– Default position on bus voltage failure	**contact opened**
Separate for the push buttons:	
– Function of the LED	orientation light (indicates colour for “0”) **LED indicates value of object**
only for orientation light:	
– Colour of the LED	**green** red
only for display of object value:	
– Colour of the LED	**“0” = green, “1” = red** “0” = red, “1” = green

Switch Dim /4



Selection in ETS2

– ABB
  └Push Button alpha nea
    └Push button, 2-fold for 1SA

The application program is specifically for the 2-fold switch sensor application module in connection with the flush-mounted switch actuator/sensor.

The application program has three communication objects. One push button is linked with the relay and can only be used for switching. The other push button can be used for switching and dimming. This assignment can be set in the parameters.

Switch

In the setting “switch / dimming sensor”, “On” or “Off” telegrams are sent to the EIB by the switch sensor when the rocker is pressed for a short period. With the parameter setting “switch sensor”, no distinction is made between whether the push button is pressed for a long or short period.

Dim

When the rocker is pressed for a long period, the switch sensor sends dimming telegrams. When a push button is released, a “Stop dimming ” telegram is sent.

With the parameters “Function of the LED”, it can be determined whether the LED displays the value of the switching object of the push button or as an orientation light always glows the same colour.

On bus voltage failure, all the communication objects are set to “0”. The relay contact is opened.

Communication objects
when the relay is linked with the left push button

No.	Type	Object name	Function
0	1 bit	Output / left push button	Switch / Telegr. switch
1	1 bit	Right push button -short	Telegr. switch
2	4 bit	Right push button -long	Telegr. relative dimming

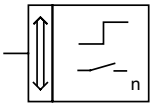
Communication objects
when the relay is linked with the right push button

No.	Type	Object name	Function
0	1 bit	Left push button -short	Telegr. switch
1	1 bit	Output / right push button	Switch / Telegr. switch
2	4 bit	Left push button -long	Telegr. relative dimming

Parameters
The default setting for the values is **printed in bold type.**

For the switch output:	
–Relay is linked with	**object no. 0 (left push button)** object no. 1 (right push button)
– Default position on bus voltage failure	**contact opened**
Separate for both push buttons:	
– Function	**switch / dimming sensor** switch sensor
– Function of the LED	orientation light **LED indicates value of switch object**
only for orientation light:	
– Colour of the LED	**green** red
only for display of object value:	
– Colour of the LED	**“0” = green, “1” = red** “0” = red, “1” = green

Switch Shutter /9.1



Selection in ETS2

– ABB
  └Push Button alpha nea
    └Push button, 2-fold for 1SA

The application program is specifically for the 2-fold switch sensor application module in connection with the flush-mounted switch actuator/sensor.

The application program has three communication objects. One push button is linked with the relay and can only be used for switching. The other push button can be used for switching and shutter control. This assignment can be set in the parameters.

Switch

In the setting “switch sensor”, “On” or “Off” telegrams are sent by the switch sensor to the EIB when the rocker is pressed. The value of the switching communication object can be set in the parameters.

Shutter

In the setting “Shutter sensor”, the push button sends “Move shutter up/down” telegrams if it is pressed for a long period. When it is pressed for a short period, it sends “Adjust lamella/stop” telegrams.

With the parameters “Function of the LED”, it can be determined whether the LED displays the value of the switching object of the push button or as an orientation light always glows the same colour.

On bus voltage failure, all the communication objects are set to “0”. The relay contact is opened.

Communication objects
when the relay is linked with the left push button

No.	Type	Object name	Function
0	1 bit	Output / left push button	Switch / Telegr. switch
1	1 bit	Right push button -short	Telegr. adj. lamella / stop
2	1 bit	Right push button -long	Telegr. move shutter Up-Down

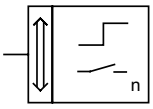
Communication objects
when the relay is linked with the right push button

No.	Type	Object name	Function
0	1 bit	Left push button -short	Telegr. adj. lamella / stop
1	1 bit	Output / right push button	Switch / Telegr. switch
2	1 bit	Left push button -long	Telegr. move shutter Up-Down

Parameters
The default setting for the values is **printed in bold type.**

For the switch output:	
– Relay is linked with	**object no. 0 (left push button)** object no. 1 (right push button)
– Default position on bus voltage failure	**contact opened**
Separate for both push buttons:	
– Function	**shutter sensor** switch sensor
only for shutter sensor:	
– Switch function	**top = up / bottom = down** top = down / bottom = up
only for switch sensor:	
– Switch function	top = off / bottom = on **top = on / bottom = off**
– Function of the LED	orientation light **LED indicates switch object value**
only for orientation light:	
– Colour of the LED	**green** red
only for display of object value:	
– Colour of the LED	**“0” = green, “1” = red** “0” = red, “1” = green

Switch Edge
Flexible allocation /5.1



Selection in ETS2

– ABB
  └Push Button alpha nea
    └Push button, 2-fold for 1SA

The application program is specifically for the 2-fold switch sensor application module in connection with the flush-mounted switch actuator/sensor.

Switch

The switch sensor has the communication objects “Object A” to “Object D” that can send or receive switching telegrams.

Edge

With the parameters “Reaction to close upper contact”, “Reaction to open upper contact” and the corresponding parameters for the lower contact, it can be determined when the push button sends “On” or “Off” telegrams.

Flexible allocation

With this parameter setting, it can be freely determined which communication object is used for sending switching telegrams.

With the parameters “Function of LED …”, it can be determined whether the LED displays the value of one of the objects or as an orientation light always glows the same colour.

If the LED displays an object value, the next parameter determines which colour represents the value “0” or the value “1”.

If the LED is used as an orientation light, the colour of the LED can also be set.

The relay contact can also be linked with any one of the objects. If the object has the value “1”, the relay closes, if the object has the value “0”, the relay opens.

On bus voltage failure, all the communication objects are set to “0”. The relay contact is opened.

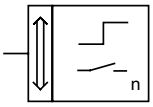
Communication objects

No.	Type	Object name	Function
0	1 bit	Object A	Telegr. switch
1	1 bit	Object B	Telegr. switch
2	1 bit	Object C	Telegr. switch
3	1 bit	Object D	Telegr. switch

Parameters
The default setting for the values is **printed in bold type.**

For the switch output:	
–Relay is linked with	**Object A** Object B Object C Object D
– Default position on bus voltage failure	**contact opened**
Separate for both LEDs:	
– Function of LED …	**LED indicates value of object A** LED indicates value of object B LED indicates value of object C LED indicates value of object D orientation light
only for orientation light:	
– Colour of the LED	**green** red
only for display of object value:	
– Colour of the LED	**“0” = green, “1” = red** “0” = red, “1” = green
Separate for both push buttons:	
– Reaction to close upper contact	no reaction ON OFF **TOGGLE**
– "Close upper contact" linked to	**Object A** Object B Object C Object D
– Reaction to open upper contact	**no reaction** ON OFF TOGGLE
– "Open upper contact" linked to	**Object A** Object B Object C Object D
– Reaction to close lower contact	no reaction ON OFF **TOGGLE**
– "Close lower contact" linked to	Object A **Object B** Object C Object D
– Reaction to open lower contact	**no reaction** ON OFF TOGGLE
– "Open lower contact" linked to	Object A **Object B** Object C Object D

Switch LED /6



Selection in ETS2

– ABB
  └Push Button alpha nea
    └Push button, 4-fold for 1SA

The application program is specifically for the 4-fold switch sensor application module in connection with the flush-mounted switch actuator/sensor.

The application program has four communication objects for the push buttons and four for the LEDs. One of the communication objects for the LEDs is used simultaneously for controlling the relay. This assignment can be set in the parameters.

Switch

The switch sensor sends an “On” telegram to the EIB when the upper contact of one of the rockers is pressed and an “Off” telegram when the lower rocker of one of the rockers is pressed.

LED

With the parameters “Function of the LED”, it can be determined whether the LED displays the value of the object “… LED” or as an orientation light always glows the same colour. The function “Orientation light” is not available for the LED that is linked with the relay.

If the LED is to be used as an orientation light, the ETS2 does not display the “LED” communication object.

On bus voltage failure, all the communication objects are set to “0”. The relay contact is opened.

Communication objects
when the relay is linked with the left LED

No.	Type	Object name	Function
0	1 bit	Left push button	Telegr. switch
1	1 bit	Mid left push button	Telegr. switch
2	1 bit	Mid right push button	Telegr. switch
3	1 bit	Right push button	Telegr. switch
4	1 bit	Left LED / output	Change colour / switch
5	1 bit	Mid left LED	Change colour
6	1 bit	Mid right LED	Change colour
7	1 bit	Right LED	Change colour

Communication objects
when the relay is linked with the mid left LED

No.	Type	Object name	Function
…			
4	1 bit	Left LED	Change colour
5	1 bit	Mid left LED / output	Change colour / switch
6	1 bit	Mid right LED	Change colour
7	1 bit	Right LED	Change colour

Communication objects
when the relay is linked with the mid right LED

No.	Type	Object name	Function
…			
4	1 bit	Left LED	Change colour
5	1 bit	Mid left LED	Change colour
6	1 bit	Mid right LED / output	Change colour / switch
7	1 bit	Right LED	Change colour

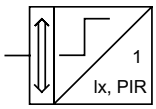
Communication objects
when the relay is linked with the right LED

No.	Type	Object name	Function
…			
4	1 bit	Left LED	Change colour
5	1 bit	Mid left LED	Change colour
6	1 bit	Mid right LED	Change colour
7	1 bit	Right LED / output	Change colour / switch

Parameters
The default setting for the values is **printed in bold type.**

For the switch output:	
– Relay is linked with	**object no. 4 (left LED)** object no. 5 (mid left LED) object no. 6 (mid right LED) object no. 7 (right LED)
– Default position on bus voltage failure	**contact opened**
Separate for the push buttons:	
– Function of the LED	orientation light (indicates colour for “0”) **LED indicates value of object**
only for orientation light:	
– Colour of the LED	**green** red
only for display of object value:	
– Colour of the LED	**“0” = green, “1” = red** “0” = red, “1” = green

Switch Cyclic On /3



Selection in ETS2

– ABB
  └Phys. Sensors
    └Movement sensor for 1SA

The application program is specifically for the movement sensor application module in connection with the flush-mounted switch actuator/sensor.

Switch

The movement sensor sends switching telegrams if it picks up movement in its detection range. At the same time the relay contact closes.

Cyclic On

At set cyclic intervals, it sends only “On” telegrams to the EIB. If the sensor does not detect any further movement, it stops sending telegrams. The relay then opens.

If more actuators are to be controlled, they must be set to “staircase lighting function” to be switched off. So that the number of telegrams does not become unnecessarily high, once all the settings have been entered, the interval for cyclic sending should be made as long as possible.

The operating mode of the movement sensor can be set using the slide switch. It notifies other movement sensors of this change via object no. 1. If the movement sensor is switched off manually, the “Movement” object sends an “Off” telegram once.

On bus voltage failure, all the communication objects are set to the value “0”. The relay contact is opened.

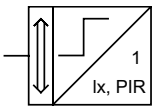
Communication objects

No.	Type	Object name	Function
0	1 bit	Movement or manually On/Off	Telegr. switch (cycl. ON)
1	1 bit	Slide switch / Mode	Telegr. automatic/manual

Parameters
The default setting for the values is **printed in bold type.**

Time for cyclic sending	**1.3 s** / 10 s / 20 s / 30 s

Switch On-Off /2



Selection in ETS2

– ABB
  └Phys. Sensors
    └Movement sensor for 1SA

The application program is specifically for the movement sensor application module in connection with the flush-mounted switch actuator/sensor. The relay is linked with object no. 0 “Output/movement …”.

Switch

The movement sensor sends switching telegrams if it picks up movement in its detection range.

The relay always closes if object no. 0 sends an “On” telegram and opens if the object sends an “Off” telegram.

On-Off

In the default setting, the object “Movement detector or slide switch” sends an “On” telegram once at the beginning of the movement and an “Off” telegram once at the end of the movement.

The same object is also linked to the slide switch and sends an “On” telegram if the switch is pushed to the right and an “Off” telegram if it is pushed to the left.

With the parameter “Telegram when movement starts/ends”, the “On” and “Off” telegram can also be swapped over. The same applies to the operation of the slide switch.

Via the object “Movement detector”, the movement sensor can be activated with the value “1” and deactivated with the value “0”. Once the bus voltage is applied, the movement sensor is activated by default.

The switch object can also if required send a telegram at the beginning and/or end of the deactivation. The slide switch can be made dependent on the object “Movement detector” using a parameter.

If the object “Light sensor” is linked to a group address and has the value “1”, the movement sensor functions as brightness-dependent. This is also the case when the bus voltage is applied. If the object has the value “0” or is not linked to a group address, the movement sensor is not brightness-dependent.

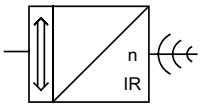
Communication objects

No.	Type	Object name	Function
0	1 bit	Output / movement or slide switch	Telegr. switch
1	1 bit	Movement detector	Activation
2	1 bit	Light sensor	Activation

Parameters
The default setting for the values is **printed in bold type.**

– Slide switch	**always activated** activated, if object 1 = ON activated, if object 1 = OFF deactivated
– Telegram when movement starts/end	OFF / ON **ON / OFF**
– Relay is linked with	**object no. 0**
– Default position on bus voltage failure	**contact opened**
– Sending characteristics of object no. 0 if movement detector is deactivated	an ON telegram once an OFF telegram once no telegram
– Sending characteristics of object no. 0 if movement detector is activated	an ON telegram once an OFF telegram once no telegram

Switch /12



Selection in ETS2

– ABB
  └Infrared
    └IR Receiver/Decoder for 1SA

The application program is specifically for the IR interface application module in connection with the flush-mounted switch actuator/sensor.

Switch

The application program has one communication object “Push button local” that is linked with the rocker of the IR interface and eight communication objects that are linked with the different push buttons of the IR remote control. A maximum of five groups of electrical loads can be switched on and off via objects no. 1 to no. 5. All the communication objects can send switching telegrams.

When the “All Off” push button of the IR remote control is pressed, object no. 6 sends an “Off” telegram.

If the push buttons “M1” or “M2” are pressed, the IR interface only sends “On” telegrams.

In the default setting the relay is linked with the “Push button local”. Using the parameter it can however also be linked with one of the five push buttons of the IR remote control.

On bus voltage failure, all the communication objects are set to “0”. The relay contact is opened.

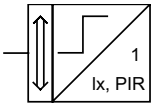
Communication objects

No.	Type	Object name	Function
0	1 bit	Push button local	Telegr. switch
1	1 bit	Push button IR 1	Telegr. switch
2	1 bit	Push button IR 2	Telegr. switch
3	1 bit	Push button IR 3	Telegr. switch
4	1 bit	Push button IR 4	Telegr. switch
5	1 bit	Push button IR 5	Telegr. switch
6	1 bit	Push button All Off	Telegr. switch (OFF)
7	1 bit	Push button M1	Telegr. switch (ON)
8	1 bit	Push button M2	Telegr. switch (ON)

Parameters
The default setting for the values is **printed in bold type.**

– Relay is linked with	**Push button local** Push button IR 1 Push button IR 2 Push button IR 3 Push button IR 4 Push button IR 5
– Default position on bus voltage failure	**contact opened**

Switch Value Cyclic Monitoring Threshold /1



Selection in ETS2

– ABB
  └Phys. Sensors
    └Movement for 1 SA

The application program is intended for the movement detector combined with the flush-mounted switch actuator/ sensor.

Using this application program, the movement detector can pick up movement in its detection range and send switching or value telegrams.

When assigning parameters, it should be noted that some parameters are only visible when “High Access” is selected and can only be modified at this point.

The setting of the threshold for the light sensor as well as the recovery time can be carried out using the potentiometer at the back of the movement detector. There is also a separate setting aid. Alternatively, the settings can be carried out in ETS. To do this, the parameter settings should be changed from “Potentiometer” to “ETS”. With the parameter “Threshold”, it is possible to indicate which brightness value triggers the movement detector. The value “0” means dark while “255” means maximum brightness. The recovery time can be set with the two parameters “Time base of recovery time” and “Time factor of recovery time”. The base and factor are multiplied to produce the recovery time:

*Recovery time = Base * Factor*

The operating mode of the movement detector can be set via the slide switch. If the slide switch is moved into position “1”, the movement detector sends a “1” to its communication object “Movement / Telegr. switch”. If it is moved into position “0”, it sends a “0”. The modified operating mode is thus transferred on the bus. In both cases, the monitoring function is inactive.

The current status of the slide switch is sent on the bus via the object “Movement / Activation”. It is therefore guaranteed that other movement detectors assume the operating mode simultaneously.

Switch

The movement detector sends switching telegrams to the communication object “Movement / Telegr. switch” when it picks up some movement in its detection range. The value of the switching telegram can be set with the parameter “Sending at detection”. It is possible to send an “ON telegram”, an “OFF telegram” or “no telegram”. The “ON” or “OFF” telegrams can also be sent cyclically.

If the movement detector senses no further movement once the recovery time has elapsed, it is possible to send an “ON telegram”, an “OFF telegram” or “no telegram”. The “ON” or “OFF” telegrams can also be sent cyclically in this case. This is determined with the parameter “Telegram after recovery time”.

It is also possible to disable the movement detector. The communication object “Movement / Activation” is used for this. It is visibly switched with the parameter “Activation object movement”.

The movement detector is activated or deactivated if a telegram is received at this object. With the parameter “At ... movement”, it can be set whether an “ON telegram”, an “OFF telegram” or “no telegram” is sent once via the communication object “Movement / Telegr. switch”.

Example:
In a functional building, all the movement detectors are enabled in the morning at a specific time. To do this, a “1” is sent with a time switch to the control centre and received at the communication object “Movement / Activation”. In this example, the parameter “Enabling movement at” is set to “ON telegram”.

Value

It is also possible to send values when movement is detected. To do this, the parameter “Type of movement object” must be changed to “Value (EIS 6)”. Dimming actuators can for example be dimmed to a value that is smaller than the maximum value.

The parameter settings “Sending at the beginning/end of the detection” determine the size of the value that is sent. The option “no telegram” can also be selected.

Cyclic

All switching telegrams can also be sent cyclically. It should be ensured that the setting “ON telegram cyclically” or “OFF telegram cyclically” is selected in the respective parameter.

The total cyclic time can be set with the parameters “Time base for cyclical sending” and “Time factor for cyclic sending”.

The cyclic sending interval for a telegram is calculated by combining the base and factor:
*Cyclic time = Base * Factor*

Monitoring

It is possible to activate a monitoring function. To do so, the general parameter “Monitoring function” must be set to “yes”. The monitoring function represents a quasi alarm signal which is not triggered at the slightest thermal movement but only if a significant power source is registered in a short time period by the movement detector or several weaker sources are detected over a longer period.

If the monitoring function is activated, there is a further communication object available “Signal / Telegr. ...” which is independent of the photo-electric sensor. The device detects the intensity and amount of movement and only sends telegrams once a specific sensitivity threshold has been exceeded. The parameter “Threshold” indicates the level of intensity. The value “255” denotes the maximum level of sensitivity while “0” indicates the minimum level.

On a further parameter page “Monitoring function”, it is possible to select the type of the monitoring object (1 bit or 1 byte), the type of telegram at the start and end of the detection and the cyclical sending behaviour.

It can also be set when the movement detector is in the monitoring function mode. The time is similar to the cyclic time in that it is calculated by combining a time base and factor.

If the monitoring function is to be enabled externally, this can be carried out with the communication object “Signal / Activation”. The parameter “Activation object monitoring” must previously be set to “available”.

Pull off detection

Pull off detection represents a further security function. If the movement detector is removed from the bus/ mains coupler, it sends a “1” via its communication object “Pull off detection / Telegr. switch”. It is therefore possible to detect any possible tampering by thieves.

Photo-electric sensor

It is also possible to activate a photo-electric sensor function. The general parameter “Photo-electric sensor” must be set to “yes”.

On a further parameter page “Photo-electric sensor”, the type of the object can be set (1 bit or 1 byte) together with the value that is sent when the lower or upper threshold is reached as well as the cyclical sending behaviour.

With the parameter “Ignore artificial light”, it is determined whether the movement detector only reacts to daylight or not.

The parameters “Lower threshold” or “Upper threshold” indicate when the telegrams should be sent by the photo-electric sensor. The value “0” means dark while “255” means maximum brightness.

If the photo-electric sensor function is to be enabled externally, this can be carried out with the communication object “Photo-electric sensor / Activation”. The parameter “Activation object photo-electric sensor” must previously be set to “available”.

Relay

The relay can be selected as a normally open contact or normally closed contact for various applications.

The relay output has its own communication object available “Output / Switch”. The relay output can thus be switched via the EIB independently of the movement detector. If the relay is to be controlled by the movement detector, the communication objects “Movement / Telegr. switch” and “Output / Switch” must be linked with a common group address.

In normal mode, the relay output can also be assigned switch ON and switch OFF delays. These delays are calculated by combining a base and factor.

In the staircase lighting mode, there is a switch ON delay available as in normal mode. The period of the staircase lighting function is assigned via a base and factor.

The actuator can send its status on the EIB. To do so, the parameter “Status response” must be set to “yes”. In this case the communication object “Output / Status” is available. If the value “1” is sent, this means that the relay has picked up.

Communication objects
with activation object

No.	Type	Object name	Function
0	1 bit	Pull off detection	Telegr. switch
1	1 bit	Movement	Telegr. switch
2	1 bit	Movement	Activation
7	1 bit	Output	Switch

Communication objects
with sending of value telegrams and status response

No.	Type	Object name	Function
0	1 bit	Pull off detection	Telegr. switch
1	1 byte	Movement	Telegr. value
…			
7	1 bit	Output	Switch
8	1 bit	Output	Status

Communication objects
with brightness-dependent switching activation object

No.	Type	Object name	Function
…			
3	1 bit	Brightness dependent switching	Activation
…			

Communication objects
with monitoring, photo-electric sensor and activation objects

No.	Type	Object name	Function
…			
5	1 bit	Signal	Telegr. switch
6	1 bit	Signal	Activation
10	1 bit	Photo-electric sensor	Telegr. switch
11	1 bit	Photo-electric sensor	Activation

Communication objects
with monitoring and photo-electric sensor values and activation objects

No.	Type	Object name	Function
…			
5	1 byte	Signal	Telegr. value
6	1 bit	Signal	Activation
10	1 byte	Photo-electric sensor	Telegr. value
11	1 bit	Photo-electric sensor	Activation

Parameters for “Low Access”
The default setting for the values is **printed in bold type.**

Movement detector parameters with low access:	
– Contact on bus voltage recovery	ON **OFF**
Movement detector:	
– Activation object movement	not available **available**
only if “available is selected”:	
– Enabling movement at	**ON telegram** OFF telegram
– At disabling the movement	**do not send a telegram** send ON telegram once send OFF telegram once
– At enabling the movement	**do not send a telegram** send ON telegram once send OFF telegram once
– Type of movement object	**Switching (EIS1)**
– Sending at detection	**ON telegram** OFF telegram ON telegram cyclically OFF telegram cyclically no telegram
– Telegram after recovery time	ON telegram **OFF telegram** ON telegram cyclically OFF telegram cyclically no telegram
– Time base for cyclical sending	**130 ms** / 2.1 s / 34 s / 9 min
– Time factor for cyclic sending	**100**
Output:	
– Operating mode	**Normal operation** Staircase lighting function
– Switch ON delay	yes **no**
only if “yes” is selected:	
– Time base for switch ON delay	0.5 ms / 8.2 ms / **130 ms /** 2.1 s / 34 s / 9 min
– Factor for switch ON delay (1 … 255)	**10**
only for “normal operation”:	
– Switch OFF delay	yes **no**
only if “yes” is selected:	
– Time base for switch OFF delay	0.5 ms / 8.2 ms / **130 ms /** 2.1 s / 34 s / 9 min
– Factor for switch OFF delay (1 … 255)	**10**
only for “staircase lighting function”:	
– Time base for staircase lighting function	0.5 ms / 8.2 ms / **130 ms /** 2.1 s / 34 s / 9 min
– Factor for staircase lighting function (1 … 255)	**10**
– Status response	yes **no**
– Relay is	**normally open contact** normally closed contact

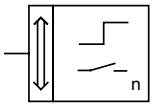
Parameters for “High Access”
The default setting for the values is **printed in bold type.**

Additional parameters for high access:	
General:	
– Monitoring function	yes **no**
only if “yes” is selected:	
Monitoring function:	
– Activation object monitoring	**not available** available
only if “available” is selected:	
– Enabling monitoring function at	**ON telegram** OFF telegram
– Type of monitoring object	**Switching (EIS 1)** Value (EIS 6)
only if “Switching (EIS 1)” is selected:	
– Sending at the beginning of detection	**ON telegram** OFF telegram ON telegram cyclically OFF telegram cyclically no telegram
– Sending at the end of detection	ON telegram **OFF telegram** ON telegram cyclically OFF telegram cyclically no telegram
– Time base for cyclical sending	**130 ms** / 2.1 s / 34 s / 9 min
– Time factor for cyclic sending	**100**
only if “Value (EIS 6)” is selected:	
– Sending at the beginning of detection	**100 %** / 90 % / … / 20 % / 10 % / OFF / no telegram
– Sending at the end of detection	100 % / 90 % / … / 20 % / 10 % / **OFF** / no telegram
– No alarm sends	**0**
– Threshold (1: sensitive / 255: insensitive)	**4**
– Time base till watch dog is in monitoring function	0.5 ms / 8.2 ms / **130 ms** / 2.1 s / 34 s / 9 min
– Time base till watch dog is in monitoring function	**150**
– Photo-electric sensor	yes **no**
only if “yes” is selected:	
Photo-electric sensor:	
– Activation object photo-electric sensor	**not available** available
only if “available” is selected:	
– Enabling threshold sensor at	**ON telegram** OFF telegram
– Ignore artificial light	**yes** / no
– Type of threshold object	**Switching (EIS 1)** Value (EIS 6)
only if “Switching (EIS 1)” is selected:	
– Sending at upper threshold	**ON telegram** OFF telegram ON telegram cyclically OFF telegram cyclically no telegram
– Sending at lower threshold	ON telegram **OFF telegram** ON telegram cyclically OFF telegram cyclically no telegram
– Time base for cyclical sending	**130 ms** / 2.1 s / 34 s / 9 min
– Time factor for cyclic sending	**100**

Parameters for “High Access”
The default setting for the values is **printed in bold type.**

only if “Value (EIS 6)” is selected:	
– Sending at upper threshold	**100 %** / 90 % / … / 20 % / 10 % / OFF / no telegram
– Sending at lower threshold	100 % / 90 % / … / 20 % / 10 % / **OFF** / no telegram
– Lower threshold (0: dark / 255: bright)	**100**
– Upper threshold (0: dark / 255: bright)	**200**
Behaviour at bus recovery: (communication objects)	
– Brightness dependent switching	**enabled** disabled
– Movement	**enabled** disabled
– Contact on bus voltage recovery	ON **OFF**
Movement detector:	
– Activation object brightness dependent switching	**not available** available
– Type of movement object	**Switching (EIS 1)** Value (EIS 6)
only if “Switching (EIS 1)” is selected:	
– Sending at detection	**ON telegram** OFF telegram ON telegram cyclically OFF telegram cyclically no telegram
– Telegram after recovery time	ON telegram **OFF telegram** ON telegram cyclically OFF telegram cyclically no telegram
– Time base for cyclical sending	**130 s** / 2.1 s / 34 s / 9 min
– Time factor for cyclic sending	**100**
only if “Value (EIS 6)” is selected:	
– Sending at detection	**100 %** / 90 % / … / 20 % / 10 % / OFF / no telegram
– Telegram after recovery time	100 % / 90 % / … / 20 % / 10 % / **OFF** / no telegram
Adjustments:	
– Threshold of light sensor is adjustable with	**Potentiometer** ETS
only if “ETS” is selected:	
– Threshold (0: dark / 255: bright)	**100**
– Recovery time adjustable with	**Potentiometer** ETS
only if “ETS” is selected:	
– Potentiometer should not be at TEST	
– Time base of recovery time	0.5 ms / 8.2 ms / 130 ms / **2.1 s** / 34 s / 9 min
– Time factor of recovery time	**100**

Switch Logic Priority Status Stairc.fct /2



Selection in ETS2

– ABB
  └Push Button triton
    └Push button, single for 1SA

The application program is specifically for the 1-fold *triton*® switch sensor application module in connection with the flush-mounted switch actuator/ sensor.

Switch

In the default setting, the output switches on when it receives a telegram with the value “1” and switches off on receipt of a telegram with the value “0”. If the parameter “Switch function” is set to “normally closed contact”, the relay closes when it receives a telegram with the value “0” and opens on receipt of a telegram with the value “1”.

If the rocker of the application module is pressed once, communication object no. 0 sends an “On” telegram. If it is pressed again, the object sends an “Off” telegram.

Logic

Using the parameter “Logical connection”, it is possible to specify an AND or an OR connection. In both cases the ETS2 program displays an additional communication object for the output. The output then links the value of communication objects 0 and 1 and switches the relay according to the result.

Priority

If the parameter “Additional function …” is set to “Priority”, the ETS2 program displays a further communication object. With the 2 bit communication object, the actuator can be positively driven by a primary control (e.g. application controller). There are three different states:

– The priority object has the value “3”. The value of the switching object is not important. The output is switched off through priority control.
– The priority object has the value “2”. The value of the switching object is not important. The output is switched on through priority control.
– The priority object has the value “1” or “0”. The output is not priority controlled. It is operated via the switching object.

If the actuator is priority controlled, changes to the 1 bit object are stored, even if the current switching state has not been directly changed as a result. When the priority controlled operation has finished, a switching operation takes place according to the current value of the switching object.

Status

If the parameter “Additional function …” is set to “Status display”, the ETS2 program displays a further 1 bit communication object. This communication object sends a telegram each time the actuator is switched. The value “1” means that the relay has accepted the active state in accordance with the parameter “Switch function”.

In the default setting, the LED displays the status of the relay by its change in colour. Alternatively it can as an orientation light always glow the same colour. Via the communication object no. 3, the LED and the backlighting of the text field can be switched on or off.

Staircase lighting function

In the operation mode “Staircase lighting function”, the output switches on immediately after receiving an “On” telegram. Once the time specified in the two parameters “Time base” and “Factor” has elapsed, the relay automatically opens. If the output receives further “On” telegrams during this interval, the period restarts each time.

If both a logical connection and a staircase lighting function have been assigned, the time setting only applies if the actuator is switched via object no. 0.

On bus voltage failure, the relay contact is opened. When the bus voltage is restored, the output can either switch in the set state or recover the state that was active prior to the failure. If the output is defined as switching on and off, the actuator takes the “Switch function” parameter into consideration.

Communication objects

No.	Type	Object name	Function
0	1 bit	Output / push button	Switch / telegr. switch
3	1 bit	Backlighting / LED	Switch

Communication objects
for OR connection

No.	Type	Object name	Function
0	1 bit	Output / push button	Switch / telegr. switch
1	1 bit	Output A	OR connection

Communication objects
for AND connection

No.	Type	Object name	Function
0	1 bit	Output / push button	Switch / telegr. switch
1	1 bit	Output A	AND connection

Communication objects
for additional function “Priority”

No.	Type	Object name	Function
…			
2	1 bit	Output A	Priority

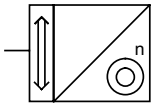
Communication objects
for additional function “Status display”

No.	Type	Object name	Function
…			
2	1 bit	Output A	Telegr. status

Parameters
The default setting for the values is **printed in bold type.**

– Switch function	**normally open contact** normally closed contact
– Operation mode	**normal operation** staircase lighting function
only for staircase lighting function:	
– Time base for staircase lighting function	130 ms / … / **520 ms** / … / 1.2 h
– Factor for staircase lighting function (2 … 127)	**8**
– Logical connection	**no logical connection** OR connection AND connection
– Additional status or priority function	**no additional function** priority status display
– Default position on bus voltage failure	**contact opened**
– Behaviour on bus voltage recovery	**recover previous state** switch on switch off
– Function of the LED	orientation light **LED indicates status of relay**
only for orientation light:	
– Colour of the LED	**green** red
only for display of relay status:	
– Colour of the LED	**“OFF” = green, “ON” = red** “OFF” = red, “ON” = green

IR Switch Dim Shutter Lightscene /7



Selection in ETS2

– ABB
  └Push Button triton
    └Push button, 3-fold for 1SA

The application module is specifically for the 3-fold Busch-triton® switch sensor in combination with the flush-mounted switch actuator/sensor.

The Busch-triton® switch sensor can be used for switching, dimming and shutter control as well as for controlling lightscenes. Various parameters and communication objects can be used for the auxiliary push button and the three rockers depending on the setting in the parameter “Number of lightscenes”.

The three rockers of the Busch-triton® switch sensor each have the same set of parameters. With the parameter “Operation mode of rocker”, the basic switch, dimming or shutter control function can be selected. Depending on this setting, different parameters and objects are available for the rockers. There is a common parameter “Push button action interpreted as long from” for all the rockers that are used for dimming or shutter control. Normally, the switch sensor detects a long push button action if a rocker is pressed for longer than 420 ms.

No lightscenes are used in the default setting. In this case, the Busch-triton® switch sensor makes two special functions available which are fault protection and switching the backlighting and LEDs.

Fault protection

The fault protection function causes only one basic function to be triggered when any of the rockers of the switch sensor are pressed. For example, pressing one of the three rockers via communication object no. 1 “Fault protection” switches the base lighting alternately on or off.

The fault protection system can be permanently activated or for example be timed to switch on or off via the EIB using object no. 0 “Fault protection Off/On”. If the parameter “Function of auxiliary push button” is set to “Interrupt fault protection”, the three rockers can be used for different functions according to their respective parameter settings once the auxiliary push button has been pressed for approximately 5 seconds.

Backlighting

The backlit text fields display the functions of the rockers even in the dark. Using the communication object “Backlighting/LED”, the backlighting and status LEDs can if required be switched on or off.

The auxiliary push button can also be used for manual switching. The parameter “Function of auxiliary push button” must be set to “Backlighting and LED on/off”. When the auxiliary push button is pressed, not only is the lighting of the switch sensor switched on or off but a telegram is sent via the communication object “Backlighting/LED”. It is therefore possible to switch on the lighting for several Busch-triton® switch sensors at the same time via a common group address.

By default, the backlighting switches on after bus voltage recovery. This can also be changed via the parameter “Behaviour of text field illumination...”.

LED

Using the parameter “Operation mode of LED”, the LEDs can be selected for use either as an orientation light or for status display.

If the LEDs are used for status display, it is possible to set which colour (red or green) is assigned to the object values “0” or “1”.

If the setting “Orientation light” is selected for the LEDs, they can either glow always red or always green or can be switched off.

IR

In addition to using the rockers, the Busch-triton® switch sensor can also be controlled remotely via an infrared hand-held transmitter. The three rockers and the auxiliary push button can be assigned individually to the white or blue infrared area of the hand-held transmitter. The relevant setting must then be selected via the slide switch on the hand-held transmitter. The MEMO button on the hand-held transmitter corresponds to the function of the auxiliary push button on the Busch-triton® switch sensor.

The three rockers of the Busch-triton® switch sensor can each be assigned separately to push buttons 1 … 5 of the IR hand-held transmitter. However only one rocker may be assigned to a push button.

Relay

The relay contact can be parameterised for various applications as a normally open or normally closed contact.

The relay output has its own communication object “Actuator”. The relay output can thus be switched via the EIB independently of the Busch-triton® switch sensor. If the relay is to be controlled for example by a rocker of the Busch-triton® switch sensor, the corresponding communication objects need to be linked with a common group address.

Normally, the relay output can also be assigned switch ON and switch OFF delays. These intervals are a combination of a time base and time factor.

In the staircase lighting function mode, there is a further parameter “Reset switch ON delay” available. This parameter enables you to specify whether the activation period of the actuator should be restarted with another telegram to the communication object “Switch”.

The parameter “Logical connection” is used if the relay output is to be assigned a logic function. A logic AND or OR function can be assigned. A further communication object then becomes available.

The actuator can also send its status to the EIB. To do this, the parameter “Status response” must be set to “yes”.

Switch

In the default setting of the Busch-triton® switch sensor, there are two 1 bit communication objects available for switching for the rockers that are not assigned lightscenes. For simple applications, it is also possible to set the parameter “Number of switch functions” so that the rocker only has one communication object.

The parameter “Working mode of the rocker” determines which value the switch sensor sends when the left or the right side of the rocker is pressed.

Dim

If the operation mode of the rocker is set to “dimming sensor”, the rocker has the communication objects “Rocker ..
.-short” for switching and “Rocker ..
.-long” for dimming.

When carrying out a switching operation, the rocker can either be pressed briefly on the left, on the right or in the middle. The switch sensor always toggles in this case.

For dimming, it is determined via the parameter “Dimming direction” which side of the rocker must be pressed and held down in order to dim up or down. When the rocker is released, the switch sensor sends the telegram “Stop dimming”.

Shutter

If the operation mode of the rocker is set to “shutter sensor”, the switch sensor sends “Move shutter up/down” telegrams when it is pressed for a long period. If the rocker is pressed for a short period, it sends “Adjust lamella/ stop” telegrams.

The parameter “Shutter direction” determines which side of the rocker must be pressed in order to move the shutter up or down.

Lightscenes

In lightscene mode, up to six scenes with up to six different groups of actuators can be controlled without special lightscene modules.

The lightscenes can be specified using further parameters or they can also be reprogrammed at a later date by the user while the installation is in operation without the need for a PC or ETS2. The auxiliary push button is used for storing new lightscenes. To do this, the parameter “Function of auxiliary push button” must be set to “Saving lightscenes”. To be able to use this function, the transmitting group addresses and flags must be assigned correctly when configuring the actuators.

Once the general parameter “Number of lightscenes” is set to at least “2”, additional parameters and other communication objects are displayed. The lightscenes are designed according to the following process.

1. For each of the actuator groups A … F, it must be determined with the parameter “Type of actuator group ...” whether they use 1 bit communication objects (switch or dimming actuators) or 8 bit communication objects (dimming actuators). Depending on this setting, the ETS2 program displays various parameters and communication objects. Communication objects 13 … 18 are used for the control of actuator groups A … F.
2. For each of the six lightscenes, values can be preset for the actuator groups on their own parameter page.
3. Using the parameter “Lightscenes are available”, it can be determined which rocker should be used for recalling lightscenes. A note then appears on the parameter page of the corresponding rocker to confirm that the rocker is assigned two lightscenes. It is now possible to specify whether the rocker is assigned to an IR push button or not. The rockers that are not used for lightscenes are still available for switching, dimming or shutter control. The parameter setting “no function / display operation“ must be selected for any unassigned rockers.

If a rocker is used for recalling lightscenes, there are two options available for controlling the LEDs: the LED can be switched off or it indicates which side of the rocker has been pressed. In this case, it glows red when the left side is pressed and green when the right side is pressed.

If the relay is to be controlled via one of the rockers, the communication object “Actuator” should be linked via a group address with the communication object of the rocker.

Application example:

In a training room, there are two groups of luminaires above the seminar participants (lamps 1 and 2) and one group of luminaires (lamp 3) above the lecture area. The room can be made darker using an electrically driven shutter.

From door 1, it should be possible to switch and dim the lamps above the seminar participants individually and to operate the shutter. At the same time, it should be possible to set a base lighting level using a single push button action.

From door 2, it should be possible to switch and dim the lights in the lecture area and to recall various lightscenes.

Two Busch-triton® switch sensors, three switch/dimming actuators and one shutter actuator are to be used.

The Busch-triton® switch sensor at door 1 has the following parameter settings:
Number of lightscenes:
0
Function of auxiliary push button:
Interrupt fault protection
Operation mode of rocker 1:
dimming sensor
Operation mode of rocker 2:
dimming sensor
Operation mode of rocker 3:
shutter sensor
Each rocker is assigned to its own IR push button and the IR area is defined as white.
The 1 bit and 4 bit communication objects of the upper and middle rockers are linked with the corresponding objects of the actuators for lamps 1 and 2. The objects of the lower rocker are linked with the objects of the shutter actuator.

So that the seminar participants do not have to search first for the correct rocker, the object “Fault protection” is linked with the 1 bit objects of the dimming actuators. The group addresses for the fault protection function should not be entered as a transmitting group address. The value for the base lighting (e.g. 80%) can be set in the parameters of the dimming actuators.

The Busch-triton® switch sensor at door 2 has the following parameter settings:
Number of lightscenes:
4
Lightscenes are available:
Rockers 1 and 2
Function of auxiliary push button:
Saving lightscenes
Operation mode of rocker 3:
dimming sensor
Each rocker is assigned to its own IR push button and the IR area is defined as blue.
Type of actuator group A:
dimming actuator (8 bit)
Type of actuator group B:
dimming actuator (8 bit)
Type of actuator group C:
dimming actuator (8 bit)
Type of actuator group D:
switch or shutter actuator (1 bit)

The 1 bit and 4 bit communication objects of the lower rocker are linked with the objects of the actuator for lamp 3. The 1 byte communication objects of the actuator groups A … C are linked with the 1 byte objects of the dimming actuators.

Due to the fact that different IR areas are assigned for the two Busch-triton® switch sensors, the lecturer can operate all the functions comfortably from any position.

The various preset options of the actuator groups for lightscenes 1 … 4 can still be corrected later. Possible combinations are for example:
Lightscene 1: Base lighting
Actuator group A: 80%,
Actuator group B: 80%,
Actuator group C: 80%,
Actuator group D: UP
Lightscene 2: OFF
Actuator group A: 0%,
Actuator group B: 0%,
Actuator group C: 0%,
Actuator group D: UP
Lightscene 3: Lecture without projection
Actuator group A: 70%,
Actuator group B: 70%,
Actuator group C: 95%,
Actuator group D: UP
Lightscene 4: Lecture with projection
Actuator group A: 40%,
Actuator group B: 40%,
Actuator group C: 20%,
Actuator group D: DOWN

If the preset options are to be corrected later, it is important to note the flags of the communication objects. The 1 byte objects of the dimming actuators require the read flag in this case. The read flag should not be set for the shutter actuator and the lower rocker of the first switch sensor, to prevent the motor from being inadvertently set in motion during the storing of lightscenes.

The definition of the lightscenes follows the steps below.
1. The required values of the lamps are set via the rockers of the switch sensors of the infrared hand-held transmitter.
2. The auxiliary push button of the second switch sensor is pressed in order to prepare for the storing of lightscenes. The LEDs of the second switch sensor glow orange in order to indicate this.
3. The rocker that is to recall this lightscene later is pressed.
4. The Busch-triton® switch sensor sends a “Read value” telegram for each of the groups of actuators and stores the 1 byte value of the dimming actuators.
5. After storing the values, the LEDs glow either red or green.

In order to have a clear assignment of the LEDs of the switch sensors to the dimming actuators even when lightscenes are being used, the 1 bit communication objects of the dimming actuators can be used for status display. For this purpose, the transmission flags are set for the 1 bit communication objects of the dimming actuators and the objects are linked with the LEDs. The correct assignment of the transmitting group addresses should be observed.

Communication objects
for switch sensor with two functions
without lightscenes

No.	Type	Object name	Function
7	1 bit	Actuator	Switching
10	1 bit	Backlighting/LED	Switching
13	1 bit	Rocker 1 left	Telegr. switch
14	1 bit	Rocker 1 right	Telegr. switch
15	1 bit	Rocker 2 left	Telegr. switch
16	1 bit	Rocker 2 right	Telegr. switch
17	1 bit	Rocker 3 left	Telegr. switch
18	1 bit	Rocker 3 right	Telegr. switch

Communication objects
for AND connection
and status response

No.	Type	Object name	Function
7	1 bit	Actuator	Switching
8	1 bit	Actuator	AND connection
9	1 bit	Actuator	Status
...			

Communication objects
for OR connection
and fault protection

No.	Type	Object name	Function
0	1 bit	Fault protection Off/On	Input telegr.
1	1 bit	Fault protection	Telegr. switch
7	1 bit	Actuator	Switching
8	1 bit	Actuator	OR connection
...			

Communication objects
for switch sensor with one function

No.	Type	Object name	Function
...			
13	1 bit	Rocker 1	Telegr. switch
15	1 bit	Rocker 2	Telegr. switch
17	1 bit	Rocker 3	Telegr. switch

Communication objects
for rockers
with shutter sensor

No.	Type	Object name	Function
...			
13	1 bit	Rocker 1 -long	Telegr. move shutter Up-Down
14	1 bit	Rocker 1 -short	Telegr. lamella adj./stop
15	1 bit	Rocker 2 -long	Telegr. move shutter Up-Down
16	1 bit	Rocker 2 -short	Telegr. lamella adj./stop
17	1 bit	Rocker 3 -long	Telegr. move shutter Up-Down
18	1 bit	Rocker 3 -short	Telegr. lamella adj./stop

Communication objects
for rockers
with dimming sensor

No.	Type	Object name	Function
...			
13	1 bit	Rocker 1 -short	Telegr. switch
14	1 bit	Rocker 1 -long	Telegr. dimming
15	1 bit	Rocker 2 -short	Telegr. switch
16	1 bit	Rocker 2 -long	Telegr. dimming
17	1 bit	Rocker 3 -short	Telegr. switch
18	1 bit	Rocker 3 -long	Telegr. dimming

Communication objects
for lightscene control
with switch actuators

No.	Type	Object name	Function
…			
13	1 bit	Actuator group A	Telegr. switch
14	1 bit	Actuator group B	Telegr. switch
15	1 bit	Actuator group C	Telegr. switch
16	1 bit	Actuator group D	Telegr. switch
17	1 bit	Actuator group E	Telegr. switch
18	1 bit	Actuator group F	Telegr. switch

Communication objects
for lightscene control
with dimming actuators

No.	Type	Object name	Function
…			
13	1 byte	Actuator group A	Telegr. brightness value
14	1 byte	Actuator group B	Telegr. brightness value
15	1 byte	Actuator group C	Telegr. brightness value
16	1 byte	Actuator group D	Telegr. brightness value
17	1 byte	Actuator group E	Telegr. brightness value
18	1 byte	Actuator group F	Telegr. brightness value

General parameters
The default setting for the values is **printed in bold type.**

General:	
– Object for backlighting switches	**text field and status LED** only text field LED
– Behaviour of text field illumination after bus voltage recovery	**ON** OFF
Without lightscene mode:	
– Function of auxiliary push button	**no function / display operation** Interrupt fault protection (approx. 5 s) Backlighting and LED on/off
With lightscene mode:	
– Function of auxiliary push button	no function / display operation **Saving lightscenes**
– IR area of auxiliary push button	**no IR** blue white
– Number of lightscenes	**0** / 2 / 4 / 6
If 2 lightscenes are selected:	
– Lightscenes are available	**Rocker 1** Rocker 2 Rocker 3
If 4 lightscenes are selected:	
– Lightscenes are available	**Rockers 1 and 2** Rockers 2 and 3
If 6 lightscenes are selected:	
– Lightscenes are available	**Rockers 1 to 3**
– Wait state between telegrams by activating lightscenes (140 ms)	**0**
– Push button action interpreted as long from	280 ms / … / **420 ms** / … / 2.1 s

Parameters without lightscene mode
The default setting for the values is **printed in bold type.**

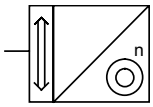
Separate for the actuator:	
– Switch behaviour	**Normally open contact** Normally closed contact
– Operation mode	**Normal operation** Staircase lighting function
If “normal operation” is selected:	
– Switch ON delay	**no** yes
If “yes” is selected:	
– Time base for switch ON delay	0.5 ms / 8 ms / **130 ms** / 2.1 s / 33 s
– Time factor for switch ON delay (1 ... 255)	**10**
– Switch OFF delay	**no** yes
If “yes” is selected:	
– Time base for switch OFF delay	0.5 ms / 8 ms / 130 ms / **2.1 s** / 33 s
– Time factor for switch OFF delay (1 ... 255)	**85**

Parameters with lightscene mode
The default setting for the values is **printed in bold type.**

If “staircase lighting function” is selected:	
– Switch ON delay	**no** yes
– Time base for switch ON delay	0.5 ms / 8 ms / **130 ms** / 2.1 s / 33 s
– Time factor for switch ON delay (1 ... 255)	**1**
– Time base for staircase lighting function	0.5 ms / 8 ms / 130 ms / **2.1 s** / 33 s
– Time factor for staircase lighting function (1 ... 255)	**85**
– Reset switch ON delay	**no** yes
– Logical connection	**no logical connection** AND connection OR connection
– Status response	**no** yes
Separate for the three rockers:	
– Operation mode of rocker	no function / display operation Shutter sensor Dimming sensor **Switch sensor**
For switch sensor:	
– Number of switch functions	**2 Functions => 2 Objects** 1 Function => 1 Object
If 2 functions are selected:	
– Working mode of the rocker	**left = TOGGLE, right = TOGGLE** left = TOGGLE, right = OFF left = OFF, right = TOGGLE left = OFF, right = OFF left = TOGGLE, right = ON left = OFF, right = ON left = ON, right = TOGGLE left = ON, right = OFF left = ON, right = ON
If 1 function is selected:	
– Working mode of the rocker	TOGGLE left = OFF, right = ON left = ON, right = OFF
– Operation mode of LED	Orientation light **Shows value of object**
For display of object value:	
– Colour of LED	OFF = green, ON = red OFF = red, ON = green
For orientation light:	
– Colour of LED	**always green** always red always off
For dimming sensor:	
– Dimming direction	**left = darker, right = brighter** left = brighter, right = darker
For shutter sensor:	
– Shutter direction	**left = down, right = up** left = up, right = down
– Operation mode of LED	Orientation light **Shows value of object rocker ...**
For orientation light:	
– Colour of LED	**always green** always red always off
For display of object value:	
– Colour of LED	**OFF = green, ON = red** OFF = red, ON = green

– Rocker is assigned to IR push button	**no IR** / 1 / 2 / 3 / 4 / 5
Only when rocker is assigned to push button:	
– IR area	**white** blue
For each rocker that is assigned a lightscene:	
– Rocker is assigned two lightscenes	<------ NOTE
– Rocker is assigned to IR push button	**no IR** / 1 / 2 / 3 / 4 / 5
Only when rocker is assigned to push button:	
– IR area	**white** blue
Separate for actuator groups A …F:	
– Type of actuator group …	switch or shutter actuator (1 bit) dimming actuator (8 bit)
Separate for lightscenes 1 ... 6 if switch or shutter actuator is selected:	
– Preset actuator group …	**OFF / UP** ON / DOWN
Separate for lightscenes 1 ... 6 if dimming actuator is selected:	
– Preset actuator group …	**0 %** / 5 % / 10 % / … / 100 %

IR LCD Switch Dim Shutter Light-scene /9



Selection in ETS2

– ABB
  └Push Button triton
    └Push button, 3-fold for 1SA

The application module is specifically for the 3-fold Busch-triton® switch sensor with LCD application module in connection with a flush-mounted switch actuator/sensor.

The Busch-triton® switch sensor can be used for switching, dimming and shutter control as well as for controlling lightscenes.

No lightscenes are made available in the default setting. If lightscenes are to be used, the parameter “Number of lightscenes” should be set to the required number. Various parameters and communication objects can be used for the rockers depending on the number of lightscenes and the parameter setting for “Lightscenes are available”.

The three rockers of the Busch-triton® switch sensor each have the same set of parameters. With the parameter “Operation mode of rocker”, the basic switch, dimming or shutter control function can be selected. Depending on this setting, different parameters and objects are available for the rokkers. There is a common parameter “Push button action interpreted as long from” for all the rockers that are used for dimming or shutter control. Normally, the switch sensor detects a long push button action if a rocker is pressed for longer than 420 ms.

If the operation mode of the rocker is set to “no function / display operation”, it is possible to alternate between 5 different displays using the rocker.

Fault protection

The fault protection function causes only one basic function to be triggered when any of the rockers of the switch sensor are pressed. For example, pressing one of the three rockers via communication object no. 1 “Fault protection” switches the base lighting alternately on or off.

The fault protection system can be permanently activated or for example be timed to switch on or off via the EIB using object no. 0 “Fault protection Off/On”. If the parameter “Function of auxiliary push button” is set to “Interrupt fault protection”, the three rockers can be used according to their respective parameter settings after pressing the auxiliary push button.

Backlighting

The backlit text fields display the functions of the rockers even in the dark. Using the communication object “Backlighting/LED”, the backlighting and status LEDs can if required be switched on or off.

The auxiliary push button can also be used for manual switching. The parameter “Function of auxiliary push button” must be set to “Backlighting and LED on/off”. When the auxiliary push button is pressed, not only is the lighting of the switch sensor switched on or off but a telegram is sent via the communication object “Backlighting/LED”. It is therefore possible to switch on the lighting for several Busch-triton® switch sensors at the same time via a common group address.

By default, the backlighting switches on after bus voltage recovery. This can also be changed via the parameter “Behaviour of text field illumination...”.

Relay

The relay contact can be parameterised for various applications as a normally open or normally closed contact.

The relay output has its own communication object “Actuator”. The relay output can thus be switched via the EIB independently of the Busch-triton® switch sensor. If the relay is to be controlled for example by a rocker of the Busch-triton® switch sensor, the corresponding communication objects need to be linked with a common group address.

The parameter “Logical connection” is used if the relay output is to be assigned a logic function. A logic AND or OR function can be assigned. A further communication object then becomes available.

The actuator can also send its status to the EIB. To do this, the parameter “Status response” must be set to “yes”.

IR

In addition to using the rockers, the Busch-triton® switch sensor can also be controlled remotely via an infrared hand-held transmitter. The rockers and the auxiliary push button can be assigned to the white or blue infrared area of the hand-held transmitter. The relevant setting must then be selected via the slide switch on the hand-held transmitter. The MEMO button on the hand-held transmitter corresponds to the function of the auxiliary push button on the Busch-triton® switch sensor.

LCD

The display of the Busch-triton® switch sensor can represent the values of five different communication objects.

In order to display switching states, relative variables such as brightness values, physical variables such as temperature values and the current time or date, it is possible to parameterise the object value for each LCD object from 1 bit to 3 bytes.

The input of the display text and several further settings is carried out using the Busch LCD management software. The software is available free of charge on the EIB CD-ROM/diskette. The function of the software is described in the “Software/Visualisation” chapter. When entering the settings, you should ensure that the data (objects) of ETS2 and the display management software match.

Switch

In the default setting of the Busch-triton® switch sensor, there are two 1 bit communication objects available for switching for the rockers that are not assigned lightscenes. For simple applications, it is also possible to set the parameter “Number of switch functions” so that the rocker only has one communication object.

The parameter “Working mode of the rocker” determines which value the switch sensor sends when the left or the right side of the rocker is pressed.

Dim

If the operation mode of the rocker is set to “dimming sensor”, the rocker has the communication objects “Rokker ..
.-short” for switching and “Rocker ..
.-long” for dimming.

When carrying out a switching operation, the rocker can either be pressed briefly on the left, on the right or in the middle. The switch sensor always toggles in this case.

For dimming, it is determined via the parameter “Dimming direction” which side of the rocker must be pressed and held down in order to dim up or down. When the rocker is released, the switch sensor sends the telegram “Stop dimming”.

Shutter

If the operation mode of the rocker is set to “shutter sensor”, the switch sensor sends “Move shutter up/down” telegrams when it is pressed for a long period. If the rocker is pressed for a short period, it sends “Adjust lamella/ stop” telegrams.

The parameter “Shutter direction” determines which side of the rocker must be pressed in order to move the shutter up or down.

LED

Using the parameter “Operation mode of LED”, the LEDs can be selected for use either as an orientation light or for status display.

If the LEDs are used for status display, it is possible to set which colour (red or green) is assigned to the object values “0” or “1”.

If the setting “Orientation light” is selected for the LEDs, they can either glow always red or always green or can be switched off.

Lightscenes

In lightscene mode, up to six scenes with up to six different groups of actuators can be controlled without special lightscene modules.

The lightscenes can be preset via the device parameters. The user can then individually reassign parameters as required while the installation is in operation. The auxiliary push button is used for storing new lightscenes (parameters). To do this, the parameter “Function of auxiliary push button” must be set to “Saving lightscenes”. To be able to use this function, the transmitting group addresses and flags must be assigned correctly to the actuators.

The lightscenes are configured according to the following process:

1. The number of lightscenes and their respective rocker assignment can be set in the “General” parameter window.
2. For each of the actuator groups A ... F, it must be determined with the parameter “Type of actuator group ...” whether they use 1 bit communication objects (switch or shutter actuators) or 8 bit communication objects (dimming actuators). Depending on this setting, the ETS2 program displays various parameters and communication objects. Communication objects 13 ... 18 are used for the control of actuator groups A ... F.
3. For each of the lightscenes, values can be preset for the actuator groups on their own parameter page.
4. The rockers that are not used for lightscenes are still available for switching, dimming or shutter control. The parameter setting “no function / display operation” must be selected for unassigned rockers.

If a rocker is used for recalling lightscenes, the LED indicates which side of the rocker has been pressed. It glows green when the left side is pressed and red when the right side is pressed.

Application example:

Dimmable ceiling lamps are installed in a hotel room. There is also a switchable reading lamp near the bed. The light in the adjoining bathroom can also be switched.

The dimmable ceiling lamps in the living/sleeping area and the lights in the bathroom are to be controlled separately from the door. It should be possible to recall two lightscenes with one push button action:

1. All the lamps are switched to maximum brightness when the room is being cleaned.
2. All the lamps are switched off when the occupants leave the room.

The current time, date, room temperature and room number should be indicated on the LCD display.

The dimmable ceiling lamps in the living/sleeping area and the reading lamp are to be controlled separately from the bed. It should be possible to recall two lightscenes with one push button action:

1. The ceiling lamps are dimmed to semi-brightness when the occupant is walking through the room during the night and the lights in the bathroom are switched on.
2. All the lamps are switched off when the occupant goes to sleep.

The same information that was displayed for the switch sensor at the door is indicated on the display.

Two 3-fold Busch-triton® switch sensors each with a flush-mounted switch/actuator sensor and a switch/dimming actuator are to be used. The relay of the switch actuator/sensor at the door switches the lighting in the bathroom. The relay of the switch actuator/sensor at the bed switches the reading lamp.

The Busch-triton® switch sensor at the door has the following parameter settings:

Number of lightscenes:
2
Lightscenes are available:
Rocker 1
Function of auxiliary push button:
Backlighting and LED on/off
Operation mode of rocker 1:
Rocker is assigned two lightscenes
Operation mode of rocker 2:
dimming sensor

Operation mode of rocker 3:
switch sensor (1 function)
Rocker is assigned to IR push button:
no IR
Type of actuator group A:
dimming actuator (8 bit)
Type of actuator group B:
switch or shutter actuator (1 bit)
Type of actuator group C:
switch or shutter actuator (1 bit)

The two lightscenes are defined as follows:
Lightscene 1: Base lighting
Actuator group A: 100%,
Actuator group B: ON,
Actuator group C: ON
Lightscene 2: OFF
Actuator group A: 0%,
Actuator group B: OFF,
Actuator group C: OFF

The Busch-triton® switch sensor near the bed has the following parameter settings:
Number of lightscenes:
2
Lightscenes are available:
Rocker 1
Function of auxiliary push button:
Backlighting and LED on/off
Operation mode of rocker 1:
Rocker is assigned two lightscenes
Operation mode of rocker 2:
dimming sensor
Operation mode of rocker 3:
switch sensor (1 function)
Rocker is assigned to IR push button:
no IR
Type of actuator group A:
dimming actuator (8 bit)
Type of actuator group B:
switch or shutter actuator (1 bit)
Type of actuator group C:
switch or shutter actuator (1 bit)

The two lightscenes are defined as follows:
Lightscene 1: Passage lighting
Actuator group A: 50%,
Actuator group B: ON,
Actuator group C: OFF
Lightscene 2: OFF
Actuator group A: 0%,
Actuator group B: OFF,
Actuator group C: OFF

The connections of the communication objects are similar for both switch sensors.

The 1 bit and 4 bit communication objects of rocker 2 are linked with the corresponding objects of the dimming actuators.

The 1 byte communication object of rocker 3 is linked with the actuator object.

The transmission flag is set for the switching objects of the dimming actuator. The status LEDs can thus be controlled even when retrieving lightscenes.

The 1 byte communication object of actuator group A is linked with the 1 byte object of the dimming actuator. The 1 bit communication object of actuator group B is linked with the object of rocker 3 from the same switch sensor. The 1 bit communication object of actuator group C is linked with the object of rocker 3 from the other switch sensor.

The LCD objects are linked with the corresponding group addresses for the time, date etc. When programming with the Busch LCD management software, it is important to note the corresponding assignment of the objects.

In this case the auxiliary push buttons are not used for storing lightscenes so that hotel guests do not unintentionally change the set lightscene. The read flags should therefore not be used for shutter control in both sensors and the actuator. This prevents the shutter being accidentally set in motion if there is ever a requirement to parameterise the lightscenes locally.

Communication objects
for switch sensor with 2 switch functions without lightscenes

No.	Type	Object name	Function
2	3 byte	LCD object 1	Time / date
3	3 byte	LCD object 2	Time / date
4	3 byte	LCD object 3	Time / date
5	3 byte	LCD object 4	Time / date
6	3 byte	LCD object 5	Time / date
7	1 bit	Actuator	Switching
10	1 bit	Backlighting/LED	Switching
13	1 bit	Rocker 1 left	Telegr. switch
14	1 bit	Rocker 1 right	Telegr. switch
15	1 bit	Rocker 2 left	Telegr. switch
16	1 bit	Rocker 2 right	Telegr. switch
17	1 bit	Rocker 3 left	Telegr. switch
18	1 bit	Rocker 3 right	Telegr. switch

Communication objects
for switch sensor with 1 switch function without lightscenes

No.	Type	Object name	Function
...			
13	1 bit	Rocker 1	Telegr. switch
15	1 bit	Rocker 2	Telegr. switch
17	1 bit	Rocker 3	Telegr. switch

Communication objects
for fault protection

No.	Type	Object name	Function
0	1 bit	Fault protection Off/On	Input telegr.
1	1 bit	Fault protection	Telegr. switch
...			

Communication objects
for status response and AND connection without lightscenes

No.	Type	Object name	Function
...			
7	1 bit	Actuator	Switching
8	1 bit	Actuator	AND connection
9	1 bit	Actuator	Status
...			

Communication objects
for status response and AND connection with lightscenes

No.	Type	Object name	Function
...			
5	1 bit	Actuator	Switching
6	1 bit	Actuator	AND connection
7	1 bit	Actuator	Status
...			

Communication objects
for OR connection

No.	Type	Object name	Function
...			
7	1 bit	Actuator	Switching
8	1 bit	Actuator	OR connection
...			

Communication objects
for switch sensor with 2 switch functions and 2 lightscenes with switch actuators on rocker 1

No.	Type	Object name	Function
0	3 byte	LCD object 1	Time / date
1	3 byte	LCD object 2	Time / date
2	3 byte	LCD object 3	Time / date
3	3 byte	LCD object 4	Time / date
4	3 byte	LCD object 5	Time / date
5	1 bit	Actuator	Switching
8	1 bit	Backlighting/LED	Switching
9	1 bit	Rocker 2 left	Telegr. switch
10	1 bit	Rocker 2 right	Telegr. switch
11	1 bit	Rocker 3 left	Telegr. switch
12	1 bit	Rocker 3 right	Telegr. switch
13	1 bit	Actuator group A	Telegr. switch
14	1 bit	Actuator group B	Telegr. switch
15	1 bit	Actuator group C	Telegr. switch
16	1 bit	Actuator group D	Telegr. switch
17	1 bit	Actuator group E	Telegr. switch
18	1 bit	Actuator group F	Telegr. switch

Communication objects
for lightscenes with dimming actuators

No.	Type	Object name	Function
...			
13	1 byte	Actuator group A	Telegr. brightness value
14	1 byte	Actuator group B	Telegr. brightness value
15	1 byte	Actuator group C	Telegr. brightness value
16	1 byte	Actuator group D	Telegr. brightness value
17	1 byte	Actuator group E	Telegr. brightness value
18	1 byte	Actuator group F	Telegr. brightness value

Communication objects
for dimming sensor without lightscenes

No.	Type	Object name	Function
...			
13	1 bit	Rocker 1 -short	Telegr. switch
14	4 bit	Rocker 1 -long	Telegr. dimming
15	1 bit	Rocker 2 -short	Telegr. switch
16	4 bit	Rocker 2 -long	Telegr. dimming
17	1 bit	Rocker 3 -short	Telegr. switch
18	4 bit	Rocker 3 -long	Telegr. dimming

Communication objects
for shutter sensor without lightscenes

No.	Type	Object name	Function
...			
13	1 bit	Rocker 1 -long	Telegr. move shutter Up-Down
14	1 bit	Rocker 1 -short	Telegr. lamella adj./stop
15	1 bit	Rocker 2 -long	Telegr. move shutter Up-Down
16	1 bit	Rocker 2 -short	Telegr. lamella adj./stop
17	1 bit	Rocker 3 -long	Telegr. move shutter Up-Down
18	1 bit	Rocker 3 -short	Telegr. lamella adj./stop

Communication objects
for 1 bit (switch) LCD object value without lightscenes

No.	Type	Object name	Function
2	1 bit	LCD object 1	Switching
3	1 bit	LCD object 2	Switching
4	1 bit	LCD object 3	Switching
5	1 bit	LCD object 4	Switching
6	1 bit	LCD object 5	Switching
...			

Communication objects
for 1 byte (value) LCD object value without lightscenes

No.	Type	Object name	Function
2	1 byte	LCD object 1	Value
3	1 byte	LCD object 2	Value
4	1 byte	LCD object 3	Value
5	1 byte	LCD object 4	Value
6	1 byte	LCD object 5	Value
...			

Communication objects
for 2 byte (value) LCD object value without lightscenes

No.	Type	Object name	Function
2	2 byte	LCD object 1	Value
3	2 byte	LCD object 2	Value
4	2 byte	LCD object 3	Value
5	2 byte	LCD object 4	Value
6	2 byte	LCD object 5	Value
...			

Communication objects
for 3 byte (time/date) LCD object value without lightscenes

No.	Type	Object name	Function
2	3 byte	LCD object 1	Time / date
3	3 byte	LCD object 2	Time / date
4	3 byte	LCD object 3	Time / date
5	3 byte	LCD object 4	Time / date
6	3 byte	LCD object 5	Time / date
...			

Parameters
The default setting for the values is **printed in bold type.**

General:	
– Object for backlighting switches	**text field and status LED** only text field LED
– Behaviour of text field illumination after bus voltage recovery	**ON** OFF
– Function of auxiliary push button	**no function / display operation** Interrupt fault protection (approx. 5 s) Backlighting and LED on/off
– IR area of auxiliary push button (MEMO)	white **no IR** blue
– Number of lightscenes	**0** / 2 / 4 / 6
If 2 lightscenes are selected:	
– Lightscenes are available	**Rocker 1** Rocker 2 Rocker 3
If 4 lightscenes are selected:	
– Lightscenes are available	**Rockers 1 and 2** Rockers 2 and 3
If 6 lightscenes are selected:	
– Lightscenes are available	**Rockers 1 to 3**
– Wait state between telegrams by activating lightscenes (140ms)	**0**
– Push button action interpreted as long from	280 ms / **420 ms** / ... / 2.1 s

Separate for the relay contact:

– Switch function	**Normally open contact** Normally closed contact
– Operation mode	**Normal operation** Staircase lighting function
If “normal operation” is selected:	
– Switch ON delay	**no** yes
If “yes” is selected:	
– Time base for switch ON delay	0.5 ms / 8 ms / **130 ms** / 2.1 s / 33 s
– Time factor for switch ON delay (1 ... 255)	**10**
– Switch OFF delay	**no** yes
If “yes” is selected:	
– Time base for switch OFF delay	0.5 ms / 8 ms / 130 ms / **2.1 s** / 33 s
– Time factor for switch OFF delay (1 ... 255)	**85**

If “staircase lighting function” is selected:

– Switch ON delay	**no** yes
If “yes” is selected:	
– Time base for switch ON delay (1 ... 255)	0.5 ms / 8 ms / **130 ms** / 2.1 s / 33 s
– Time factor for switch ON delay	**10**
– Time base for staircase lighting function	0,5 ms / 8 ms / 130 ms / **2.1 s** / 33 s
– Time factor for staircase lighting function (1 ... 255)	**8**
– Reset switch ON delay	no **yes**

– Logical connection	**no logical connection** AND connection OR connection
– Status response	**no** yes
Separate for rockers 1 to 3:	
With lightscenes:	
– Rocker is assigned two lightscenes	**<— NOTE**
– Rocker is assigned to IR push button	**no IR** / 1 / 2 / 3 / 4 / 5
If rocker is assigned to push button:	
– IR area	**white** blue
Without lightscenes:	
– Operation mode of rocker	no function / display operation Shutter sensor Dimming sensor **Switch sensor**
For switch sensor:	
– Number of switch functions	**2 Functions => 2 Objects** 1 Function => 1 Object
If 1 function is selected:	
– Working mode of the rocker	**TOGGLE** left = OFF, right = ON left = ON, right = OFF
If 2 functions are selected:	
– Working mode of the rocker	**left = TOGGLE, right = TOGGLE** left = TOGGLE, right = OFF left = OFF, right = TOGGLE left = OFF, right = OFF left = TOGGLE, right = ON left = OFF, right = ON left = ON, right = TOGGLE left = ON, right = OFF left = ON, right = ON
For dimming sensor:	
– Dimming direction	**left = darker, right = brighter** left = brighter, right = darker
For shutter sensor:	
– Shutter direction	**left = down, right = up** left = up, right = down
– Operation mode of LED	Orientation light **Shows value of object rocker ...**
For display of object value:	
– Colour of LED	**OFF = green, ON = red** OFF = red, ON = green
For orientation light:	
– Colour of LED	**always green** always red always off

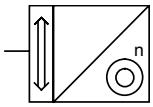
– Rocker is assigned to IR push button	**no IR** / 1 / 2 / 3 / 4 / 5
If rocker is assigned to push button:	
– IR area	**white** blue

Actuator types for lightscenes:	
Separate for each actuator group:	
– Type of actuator group A ... F	**switch or shutter actuator (1 bit)** dimming actuator (8 bit)

Separate for each lightscene:	
For switch or shutter actuator:	
– Preset actuator group A ... F	**OFF / UP** ON / DOWN
For dimming actuator:	
– Preset actuator group A ... F	**0 %** / 5 % / ... / 95 % / 100 %

Display settings:	
Separate for each LCD object:	
– Type of LCD object 1 … 5	1 bit (switch) 1 byte (value) 2 byte (value) **3 byte (time/date)**

IR Switch Dim Shutter Lightscene /3.2



Selection in ETS2

– ABB
  └Push Button triton
    └Push button, 5-fold for 1SA

The application module is specifically for the 5-fold Busch-triton® switch sensor in connection with a flush-mounted switch actuator/sensor.

The Busch-triton® switch sensor can be used for switching, dimming and shutter control as well as for controlling lightscenes. Various parameters and communication objects can be used for the five rockers depending on the setting selected in the parameters “Number of lightscenes” and “Lightscenes are available”.

Four lightscenes are available in the default setting which can be retrieved via rockers 4 and 5. By changing the parameter “Lightscenes are available”, the other rockers can also be used for controlling lightscenes.

The rockers of the Busch-triton® switch sensor which are not used for controlling lightscenes each have the same set of parameters. With the parameter “Operation mode of the rocker”, the basic switching, dimming or shutter control function can be selected. Depending on this setting, different parameters and objects are available for the rockers. There is a common parameter “Push button action interpreted as long from” for all the rockers that are used for dimming or shutter control. Normally, the switch sensor detects a long push button action if a rocker is pressed for longer than 400 ms.

Backlighting

The backlit text fields display the functions of the rockers even in the dark. Using the communication object “Backlighting/LED”, the backlighting and status LEDs can if required be switched on or off.

The auxiliary push button can also be used for manual switching. The parameter “Function of auxiliary push button” must be set to “Backlighting and LED on/off”. When the auxiliary push button is pressed, not only is the lighting of the switch sensor switched on or off but a telegram is sent via the communication object “Backlighting/LED”. It is therefore possible to switch on the lighting for several Busch-triton® switch sensors at the same time via a common group address.

By default, the backlighting switches on after bus voltage recovery. This can also be changed via the parameter “Behaviour of text field illumination...”.

Relay

Using the parameter “Relay connected with”, it is possible to control the relay locally via one of the rockers or via the bus. A communication object of one of the rockers can therefore be selected which is used for switching, dimming or shutter control.

IR

In addition to using the rockers, the Busch-triton® switch sensor can also be controlled remotely via an infrared hand-held transmitter. The five rockers and the auxiliary push button can be assigned to the white or blue infrared area of the hand-held transmitter. The relevant setting must then be selected via the slide switch on the hand-held transmitter. The MEMO button on the transmitter corresponds to the function of the auxiliary push button on the Busch-triton® switch sensor.

Switch

In the default setting of the Busch-triton® switch sensor, there are two 1 bit communication objects available for each of the rockers that are not used for lightscene control so that they can carry out switching operations. For simple applications, it is also possible to set the parameter “Number of switch functions” so that the rocker only has one communication object.

The parameter “Working mode of the rocker” determines which value the switch sensor sends when the left or the right side of the rocker is pressed.

Dim

If the operation mode of the rocker is set to “dimming sensor”, the rocker has the communication objects “Rocker ...
-short” for switching and “Rocker ...
-long” for dimming.

When carrying out a switching operation, the rocker can either be pressed on the left, on the right or in the middle. The switch sensor always toggles in this case.

For dimming, it is determined via the parameter “Dimming direction” which side of the rocker must be pressed and held down in order to dim up or down. When the rocker is released, the switch sensor sends the telegram “Stop dimming”.

Shutter

If the operation mode of the rocker is set to “shutter sensor”, the switch sensor sends “Move shutter up/down” telegrams when it is pressed for a long period on either the left or right hand side. If the rocker is pressed on either side for a short period, it sends “Adjust lamella/stop” telegrams.

The parameter “Shutter direction” determines which side of the rocker must be pressed in order to move the shutter up or down.

LED

If the backlighting of the text fields is switched on, the LEDs can be selected for use either as an orientation light or for status display with the parameter “Operation mode of LED”.

It is possible to assign the colours (red or green) of the object values “0” or “1” for the LEDs that are used for status display.

If used as an orientation light, the LED can either glow always red or always green or can also be switched off.

Lightscenes

In lightscene mode, up to six scenes with up to six different groups of actuators can be controlled without special lightscene modules.
The lightscenes can be preset via the device parameters. The user can then individually reassign parameters as required while the installation is in operation. The auxiliary push button is used for storing new lightscenes (parameters). To do this, the parameter “Function of auxiliary push button” must be set to “Storage of lightscenes”. To be able to use this function, the correct transmitting group addresses and flags must be assigned to the actuators.

The lightscenes are designed according to the following process.

1. The number of lightscenes and their respective rocker assignment can be set in the “General” parameter window.
2. For each of the groups of actuators A ... F, it must be determined with the parameter “Type of actuator group ...” whether they use 1 bit communication objects (switch or shutter actuators) or 8 bit communication objects (dimming actuators). Depending on this setting, the ETS2 program displays various parameters and communication objects. Communication objects 12 ... 17 are used for the control of actuator groups A ... F.
3. For each of the lightscenes, values can be preset for the actuator groups on their own parameter page.
4. The rockers that are not used for lightscenes are available for switching, dimming or shutter control. The parameter setting “no function/display operation” must be selected for unassigned rockers.

If a rocker is used for recalling lightscenes, the LED indicates which side of the rocker has been pressed. It glows green when the left side is pressed and red when the right side is pressed.

1-fold switch actuator/sensor, FM
Type: 6110 U-101-500 + 6324-xx

Application example:

In a training room, there are two groups of dimmable lamps above the seminar participants (lamps 1 and 2) and two switchable groups of lamps above the lecture area (lamps 3 and 4). The room can be made darker using two electrically driven shutters.

From door 1, it should be possible to individually switch and dim the lamps above the seminar participants and the lamps in the lecture area. It should also be possible to recall two lightscenes (base lighting and OFF).

From door 2, it should be possible to switch the lamps in the lecture area, operate the shutters separately and recall four lightscenes (base lighting, OFF, lecture without projection and lecture with projection).

Two 5-fold Busch-triton® switch sensors with flush-mounted switch actuators/sensors, three switch/ dimming actuators and two shutter actuators are used. The relays of the switch actuators/sensors are linked with the lamps in the lecture area.

The Busch-triton® switch sensor at door 1 has the following parameter settings:
Number of lightscenes:
2
Lightscenes are available:
Rocker 5
Function of auxiliary push button:
storage of lightscenes
Operation mode of rocker 1:
dimming sensor
Operation mode of rocker 2:
dimming sensor
Operation mode of rocker 3:
switch sensor,
1 function
Operation mode of rocker 4:
switch sensor,
1 function
Operation mode of rocker 5:
Rocker is assigned two lightscenes
IR area:
white
Relay connected with:
Object 7
Type of actuator group A:
dimming actuator (8 bit)
Type of actuator group B:
dimming actuator (8 bit)
Type of actuator group C:
dimming actuator (8 bit)
Type of actuator group D:
switch or shutter actuator (1 bit)
Type of actuator group E:
switch or shutter actuator (1 bit)
Type of actuator group F:
switch or shutter actuator (1 bit)

The 1 bit and 4 bit communication objects of rockers 1 and 2 are linked with the corresponding objects of the actuators for lamps 1 and 2.

Object 7 is linked with object 4 of the second switch sensor.

Object 9 is linked with object 3 of the second switch sensor.

The Busch-triton® switch sensor at door 2 has the following parameter settings:
Number of lightscenes:
4
Lightscenes are available:
Rockers 4 and 5
Function of auxiliary push button:
storage of lightscenes
Operation mode of rocker 1:
switch sensor,
2 functions
Operation mode of rocker 2:
shutter sensor
Operation mode of rocker 3:
shutter sensor
Operation mode of rocker 4:
Rocker is assigned two lightscenes
Operation mode of rocker 5:
Rocker is assigned two lightscenes
IR area:
blue
Relay connected with:
Object 3
Type of actuator group A:
dimming actuator (8 bit)
Type of actuator group B:
dimming actuator (8 bit)
Type of actuator group C:
switch or shutter actuator (1 bit)
Type of actuator group D:
switch or shutter actuator (1 bit)
Type of actuator group E:
switch or shutter actuator (1 bit)
Type of actuator group F:
switch or shutter actuator (1 bit)

Objects 3 and 4 are linked with objects 9 or 7 of the first switch sensor.

The 1 bit communication objects of rockers 2 and 3 are linked with the corresponding objects of the actuators for the shutters.

The communication objects of actuator groups A and B for both switch sensors are linked with the 1 byte objects of the dimming actuators.

The objects of actuator groups C and D are linked with object 7 of the first switch sensor or with object 3 of the second switch sensor.

The 1 bit communication objects of actuator groups E ... F are linked with the 1 bit objects of the shutter actuators for raising and lowering the blinds.

Due to the different assignment of the IR area of the two Busch-triton® switch sensors, the lecturer is able to operate all the functions comfortably from any position.

The various preset options of the actuator groups for lightscenes 1 and 2 (switch sensor - door 1) or 1 ... 4 (switch sensor - door 2) can still be corrected at a later date. Possible combinations are for example:

Lightscene 1: Base lighting
- Actuator group A: 80%,
- Actuator group B: 80%,
- Actuator group C: ON,
- Actuator group D: OFF,
- Actuator group E: UP,
- Actuator group F: UP

Lightscene 2: OFF
- Actuator group A: 0%,
- Actuator group B: 0%,
- Actuator group C: OFF,
- Actuator group D: OFF,
- Actuator group E: UP,
- Actuator group F: UP

Lightscene 3: Lecture without projection
- Actuator group A: 70%,
- Actuator group B: 70%,
- Actuator group C: ON,
- Actuator group D: ON,
- Actuator group E: UP,
- Actuator group F: UP

Lightscene 4: Lecture with projection
- Actuator group A: 40%,
- Actuator group B: 40%,
- Actuator group C: OFF,
- Actuator group D: OFF,
- Actuator group E: DOWN,
- Actuator group F: DOWN

The preset options of the actuator groups can be individually reassigned by the customer while the installation is in operation. A prerequisite for this is that the read flags should be set for the communication objects of the dimmers. The read flag should not be set for the shutter actuators and the fourth rocker of the second switch sensor so that the motors are not accidentally put in motion during the storing of lightscenes.

The definition of the lightscenes follows the steps below.

1. The required values of the lamps are set via the rockers of the switch sensor or via the infrared hand-held transmitter.
2. The auxiliary push button of the switch sensor is pressed in order to prepare for the storing of lightscenes. The LEDs of the switch sensor glow orange to indicate this.
3. The rocker that is to recall this lightscene later is pressed.
4. The Busch-triton® switch sensor sends a “Read value” telegram for each of the groups of actuators and stores the 1 byte values of the dimming actuators.
5. After storing the values, the LEDs glow either red or green.

In order to have a clear assignment of the switch sensor‘s LEDs to the dimming actuators even when lightscenes are being used, the 1 bit communication objects of the dimming actuators can be used for status display. For this purpose, the transmission flags are set for the 1 bit communication objects of the dimming actuators and the objects are linked with the LEDs. The correct assignment of the transmitting group addresses i.e. the group addresses which ETS2 displays as the first group address of an object should be observed.

Communication objects
for switch sensor with two switch functions and 4 lightscenes on rockers 4 and 5 with switch or shutter actuator

No.	Type	Object name	Function
2	1 bit	Backlighting/LED	Switch
3	1 bit	Rocker 1 left	Telegr. switch
4	1 bit	Rocker 1 right	Telegr. switch
5	1 bit	Rocker 2 left	Telegr. switch
6	1 bit	Rocker 2 right	Telegr. switch
7	1 bit	Rocker 3 left	Telegr. switch
8	1 bit	Rocker 3 right	Telegr. switch
11	1 bit	Actuator group A	Telegr. switch
12	1 bit	Actuator group B	Telegr. switch
13	1 bit	Actuator group C	Telegr. switch
14	1 bit	Actuator group D	Telegr. switch
15	1 bit	Actuator group E	Telegr. switch
16	1 bit	Actuator group F	Telegr. switch

Communication objects
for switch sensor with two switch functions and 2 lightscenes on rocker 5

No.	Type	Object name	Function
2	1 bit	Backlighting/LED	Switch
3	1 bit	Rocker 1 left	Telegr. switch
4	1 bit	Rocker 1 right	Telegr. switch
5	1 bit	Rocker 2 left	Telegr. switch
6	1 bit	Rocker 2 right	Telegr. switch
7	1 bit	Rocker 3 left	Telegr. switch
8	1 bit	Rocker 3 right	Telegr. switch
9	1 bit	Rocker 4 left	Telegr. switch
10	1 bit	Rocker 4 right	Telegr. switch
...			

Communication objects
for switch sensor with two switch functions and 6 lightscenes on rockers 1 to 3

No.	Type	Object name	Function
2	1 bit	Backlighting/LED	Switch
7	1 bit	Rocker 3 left	Telegr. switch
8	1 bit	Rocker 3 right	Telegr. switch
9	1 bit	Rocker 4 left	Telegr. switch
10	1 bit	Rocker 4 right	Telegr. switch
...			

Communication objects
for 4 lightscenes on rockers 4 and 5 with dimming actuator

No.	Type	Object name	Function
...			
11	1 byte	Actuator group A	Telegr. brightness value
12	1 byte	Actuator group B	Telegr. brightness value
13	1 byte	Actuator group C	Telegr. brightness value
14	1 byte	Actuator group D	Telegr. brightness value
15	1 byte	Actuator group E	Telegr. brightness value
16	1 byte	Actuator group F	Telegr. brightness value

Communication objects
for switch sensor with one switch function

No.	Type	Object name	Function
...			
3	1 bit	Rocker 1	Telegr. switch
5	1 bit	Rocker 2	Telegr. switch
7	1 bit	Rocker 3	Telegr. switch
9	1 bit	Rocker 4	Telegr. switch
11	1 bit	Rocker 5	Telegr. switch
...			

Communication objects
for dimming sensor and 4 lightscenes on rockers 4 and 5

No.	Type	Object name	Function
...			
3	1 bit	Rocker 1 -short	Telegr. switch
4	4 bit	Rocker 1 -long	Telegr. dimming
5	1 bit	Rocker 2 -short	Telegr. switch
6	4 bit	Rocker 2 -long	Telegr. dimming
7	1 bit	Rocker 3 -short	Telegr. switch
8	4 bit	Rocker 3 -long	Telegr. dimming
...			

Communication objects
for shutter sensor and 4 lightscenes on rockers 4 and 5

No.	Type	Object name	Function
...			
3	1 bit	Rocker 1 -long	Telegr. move shutter Up-Down
4	1 bit	Rocker 1 -short	Telegr. lamella adj./stop
5	1 bit	Rocker 2 -long	Telegr. move shutter Up-Down
6	1 bit	Rocker 2 -short	Telegr. lamella adj./stop
7	1 bit	Rocker 3 -long	Telegr. move shutter Up-Down
8	1 bit	Rocker 3 -short	Telegr. lamella adj./stop
...			

Communication objects
for switch sensor with one function and 2 lightscenes on rocker 5

No.	Type	Object name	Function
...			
3	1 bit	Rocker 1	Telegr. switch
5	1 bit	Rocker 2	Telegr. switch
7	1 bit	Rocker 3	Telegr. switch
9	1 bit	Rocker 4	Telegr. switch
...			

Parameters
The default setting for the values is **printed in bold type.**

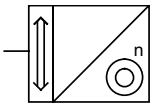
General:	
– Object for backlighting switches	**text field and status LED** only text field LED
– Behaviour of text field illumination after bus voltage recovery	**ON** OFF
– Function of auxiliary push button	no function **storage of lightscenes**
– Number of lightscenes	2 / **4** / 6
if 2 lightscenes are selected:	
– Lightscenes are available	Rocker 1 Rocker 2 Rocker 3 Rocker 4 **Rocker 5**
for 4 lightscenes:	
– Lightscenes are available	Rockers 1 and 2 Rockers 2 and 3 Rockers 3 and 4 **Rockers 4 and 5**
for 6 lightscenes:	
– Lightscenes are available	**Rockers 1 to 3** Rockers 2 to 4 Rockers 3 to 5
– Interval between telegrams when playing lightscenes (140 ms)	**0**
– IR area	blue white **no IR**
– Push button action interpreted as long from	280 ms / **420 ms** / 560 ms / 700 ms / 800 ms
if 2 lightscenes are selected:	
– Relay connected with	**rocker 1 (obj. 3)** / rocker 2 (obj. 5) / rocker 3 (obj. 7) / rocker 4 (obj. 9) / rocker 5 (obj. 11)
if 4 lightscenes are selected:	
– Relay connected with	**rocker 1 (obj. 3)** / rocker 2 (obj. 5) / rocker 3 (obj. 7)
if 6 lightscenes are selected:	
– Relay connected with	**rocker 3 (obj. 7) /** rocker 4 (obj. 9)
Separate for each rocker:	
if lightscenes are assigned:	
– Rocker is assigned two lightscenes	**<— NOTE**
if lightscenes are not assigned:	
– Operation mode of rocker	no function shutter sensor dimming sensor **switch sensor**

for switch sensor operation mode:	
– Number of switch functions	**2 functions => 2 objects** 1 function => 1 object
if 1 function is selected:	
– Working mode of rocker	**TOGGLE** left = OFF, right = ON left = ON, right = OFF
– Operation mode of LED	orientation light **indicates object value**
for display of object value:	
– Colour of the LED	**OFF = green, ON = red** OFF = red, ON = green
for orientation light:	
– Colour of the LED	**always green** always red always OFF
if 2 functions are selected:	
– Working mode of rocker	**left = TOGGLE, right = TOGGLE** left = TOGGLE, right = OFF left = OFF, right = TOGGLE left = OFF, right = OFF left = TOGGLE, right = ON left = OFF, right = ON left = ON, right = TOGGLE left = ON, right = OFF left = ON, right = ON
– Operation mode of LED	orientation light **indicates object value**
for display of object value:	
– Colour of the LED	**OFF = green, ON = red** OFF = red, ON = green
for orientation light:	
– Colour of the LED	**always green** always red always OFF
for dimming sensor operation mode:	
– Dimming direction	**left = darker, right = brighter** left = brighter, right = darker
– Operation mode of LED	orientation light **indicates object value**
for display of object value:	
– Colour of the LED	**OFF = green, ON = red** OFF = red, ON = green
for orientation light:	
– Colour of the LED	**always green** always red always OFF

for shutter sensor operation mode:	
– Shutter direction	**left = DOWN, right = UP** left = UP, right = DOWN
– Operation mode of LED	**orientation light** indicates object value
for display of object value:	
– Colour of the LED	**OFF = green, ON = red** OFF = red, ON = green
for orientation light:	
– Colour of the LED	a**lways green** always red always OFF
if no function is selected:	
– no setting options	

Actuator types:	
Separate for each actuator group:	
– Type of actuator group A ... F	**switch or shutter actuator (1 bit)** dimming actuator (8 bit)
Separate for each lightscene:	
for switch or shutter actuator:	
– Preset actuator group A ... F	**OFF / UP** ON / DOWN
for dimming actuator:	
– Preset actuator group A ... F	**0 %** / 5 % / ... / 95 % / 100 %

IR Switch Dim Shutter LED /3.1



Selection in ETS2

– ABB
  └Push Button
    └Push button, 5-fold for 1SA

The application module is specifically for the 5-fold Busch-triton® switch sensor in connection with a flush-mounted switch actuator/sensor.

The Busch-triton® switch sensor can be used for switching, dimming as well as for shutter control.

The rockers of the Busch-triton® switch sensor each have the same set of parameters. With the parameter “Operation mode of the rocker”, the basic switch, dimming or shutter control function can be selected. Depending on this setting, different parameters and objects are available for the rockers. There is a common parameter “Push button action interpreted as long from” for all the rockers that are used for dimming or shutter control. Normally, the switch sensor detects a long push button action if a rocker is pressed for longer than 400 ms.

Fault protection

The fault protection function causes only one basic function to be triggered when any of the rockers of the switch sensor are pressed. For example, pressing one of the three rockers via communication object no. 1 “Fault protection” switches the base lighting alternately on or off.

The fault protection system can be permanently activated or for example be timed to switch on or off via the EIB using object no. 0 “Fault protection Off/On”. If the parameter “Function of auxiliary push button” is set to “Interrupt fault protection”, the five rockers can be used according to their respective parameter settings after pressing the auxiliary push button.

Backlighting

The backlit text fields display the functions of the rockers even in the dark. Using the communication object “Backlighting/LED”, the backlighting and status LEDs can if required be switched on or off.

The auxiliary push button can also be used for manual switching. The parameter “Function of auxiliary push button” must be set to “Backlighting and LED on/off”. When the auxiliary push button is pressed, not only is the lighting of the switch sensor switched on or off but a telegram is sent via the communication object “Backlighting/LED”. It is therefore possible to switch on the lighting for several Busch-triton® switch sensors at the same time via a common group address.

By default, the backlighting switches on after bus voltage recovery. This can also be changed via the parameter “Behaviour of text field illumination...”.

Relay

Using the parameter “Relay connected with”, it is possible to control the relay locally via one of the rockers or via the bus. A communication object of one of the rockers can therefore be selected which is used for switching, dimming or shutter control.

IR

In addition to using the rockers, the Busch-triton® switch sensor can also be controlled remotely via an infrared hand-held transmitter. The five rockers and the auxiliary push button can be assigned to the white or blue infrared area of the hand-held transmitter. The relevant setting must then be selected via the slide switch on the hand-held transmitter. The MEMO button on the transmitter corresponds to the function of the auxiliary push button on the Busch-triton® switch sensor.

Switch

In the default setting of the Busch-triton® switch sensor, there are two 1 bit communication objects available for the rockers for switching. For simple applications, it is also possible to set the parameter “Number of switch operations” so that the rocker only has one communication object.

The parameter “Working mode of the rocker” determines which value the switch sensor sends when the left or the right side of the rocker is pressed.

Dim

If the operation mode of the rocker is set to “dimming sensor”, the rocker has the communication objects “Rocker ...
-short” for switching and “Rocker ...
-long” for dimming.

When carrying out a switching operation, the rocker can either be pressed on the left, on the right or in the middle. The switch sensor always toggles in this case.

For dimming, it is determined via the parameter “Dimming direction” which side of the rocker must be pressed and held down in order to dim up or down. When the rocker is released, the switch sensor sends the telegram “Stop dimming”.

Shutter

If the operation mode of the rocker is set to “shutter sensor”, the switch sensor sends “Move shutter up/down” telegrams when it is pressed for a long period on either the left or right hand side. If the rocker is pressed on either side for a short period, it sends “Adjust lamella/stop” telegrams.

The parameter “Shutter direction” determines which side of the rocker must be pressed in order to move the shutter up or down.

LED

If the backlighting of the text fields is switched on, the LEDs can be selected for use either as an orientation light or to display the value of a communication object with the parameter “Operation mode of LED”.

It is possible to assign the colours (red or green) of the object values “0” or “1” for the LEDs that are used for status display.

If used as an orientation light, the LED can either glow always red or always green or can also be switched off.

Application example:

In a lecture theatre, there is one group of dimmable downlighters above the seminar participants, one group of dimmable spotlights above the lecture area and two groups of switchable wall floodlights. The room can be made darker using two electrically driven shutters.

The seminar participants are normally only able to switch the lights on and off.

Two 5-fold Busch-triton® switch sensors with switch actuators/sensors, two dimming actuators and two shutter actuators are used.

The two Busch-triton® switch sensors at the doors have almost identical parameter settings:
Function of the auxiliary push button:
interrupt fault protection
Operation mode of rocker 1:
switch sensor,
2 functions,
left = TOGGLE, right = TOGGLE
Operation mode of LED:
indicates object value
Colour of LED:
OFF = green, ON = red
Operation mode of rocker 2:
dimming sensor
Operation mode of LED:
indicates object value
Colour of LED:
OFF = green, ON = red
Operation mode of rocker 3:
dimming sensor
Operation mode of LED:
indicates object value
Colour of LED:
OFF = green, ON = red
Operation mode of rocker 4:
shutter sensor
Operation mode of LED:
orientation light
Colour of LED:
always OFF
Operation mode of rocker 5:
shutter sensor
Operation mode of LED:
orientation light
Colour of LED:
always OFF

The parameter “IR area” is set differently for the two switch sensors so that they do not both send telegrams when using remote control.

The relays of the switch actuators/ sensors each switch one group of wall floodlights.

The connection of group addresses to the communication objects is almost identical. Only the two objects for rocker 1 are linked with the other objects of the other switch sensor. It is therefore possible to switch both groups of wall floodlights separately when the fault protection function is deactivated.

The 1 bit communication object no. 1 “Fault protection” of the auxiliary push button is linked with the 1 bit communication objects “Rocker 1 left” for both switch sensors. When the fault protection function is active, generally both groups of wall floodlights are switched.

The 1 bit and 4 bit communication objects of rockers 1 and 2 are linked with the corresponding objects of the two dimming actuators.

The communication objects of rockers 4 and 5 for raising and lowering the shutters and for lamella adjustment are linked with the corresponding objects of the shutter actuators.

In general the switch sensor operates with an active fault protection system. The wall floodlights are switched each time any of the rockers is pressed.

The seminar participants can execute the same functions via remote control. The IR area can be set as required as both switch sensors react to different settings but carry out the same functions.

Communication objects
for switch sensor with two switch functions without fault protection

No.	Type	Object name	Function
2	1 bit	Backlighting/LED	Switch
3	1 bit	Rocker 1 left	Telegr. switch
4	1 bit	Rocker 1 right	Telegr. switch
5	1 bit	Rocker 2 left	Telegr. switch
6	1 bit	Rocker 2 right	Telegr. switch
7	1 bit	Rocker 3 left	Telegr. switch
8	1 bit	Rocker 3 right	Telegr. switch
9	1 bit	Rocker 4 left	Telegr. switch
10	1 bit	Rocker 4 right	Telegr. switch
11	1 bit	Rocker 5 left	Telegr. switch
12	1 bit	Rocker 5 right	Telegr. switch
13	1 bit	LED 1	Change colour
14	1 bit	LED 2	Change colour
15	1 bit	LED 3	Change colour
16	1 bit	LED 4	Change colour
17	1 bit	LED 5	Change colour

Communication objects
with fault protection

No.	Type	Object name	Function
0	1 bit	Input telegr.	Fault protection Off/On
1	1 bit	Fault protection	Telegr. switch
...			

Communication objects
for switch sensor with one switch function

No.	Type	Object name	Function
...			
3	1 bit	Rocker 1	Telegr. switch
5	1 bit	Rocker 2	Telegr. switch
7	1 bit	Rocker 3	Telegr. switch
9	1 bit	Rocker 4	Telegr. switch
11	1 bit	Rocker 5	Telegr. switch
...			

Communication objects
for dimming sensor

No.	Type	Object name	Function
...			
3	1 bit	Rocker 1 -short	Telegr. switch
4	4 bit	Rocker 1 -long	Telegr. dimming
5	1 bit	Rocker 2 -short	Telegr. switch
6	4 bit	Rocker 2 -long	Telegr. dimming
7	1 bit	Rocker 3 -short	Telegr. switch
8	4 bit	Rocker 3 -long	Telegr. dimming
9	1 bit	Rocker 4 -short	Telegr. switch
10	4 bit	Rocker 4 -long	Telegr. dimming
11	1 bit	Rocker 5 -short	Telegr. switch
12	4 bit	Rocker 5 -long	Telegr. dimming
...			

Communication objects
for shutter sensor

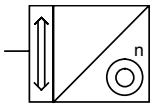
No.	Type	Object name	Function
...			
3	1 bit	Rocker 1 -long	Telegr. move shutter Up-Down
4	1 bit	Rocker 1 -short	Telegr. lamella adj./stop
5	1 bit	Rocker 2 -long	Telegr. move shutter Up-Down
6	1 bit	Rocker 2 -short	Telegr. lamella adj./stop
7	1 bit	Rocker 3 -long	Telegr. move shutter Up-Down
8	1 bit	Rocker 3 -short	Telegr. lamella adj./stop
9	1 bit	Rocker 4 -long	Telegr. move shutter Up-Down
10	1 bit	Rocker 4 -short	Telegr. lamella adj./stop
11	1 bit	Rocker 5 -long	Telegr. move shutter Up-Down
12	1 bit	Rocker 5 -short	Telegr. lamella adj./stop
...			

Parameters
The default setting for the values is **printed in bold type.**

General:	
– Object for backlighting switches	**text field and status LED** only text field LED
– Behaviour of text field illumination after bus voltage recovery	**ON** OFF
– Function of auxiliary push button	no function interrupt fault protection (approx. 5 s) **backlighting and LED on/off**
– IR area	blue **white** no IR
– Push button action interpreted as long from	280 ms / **420 ms** / 560 ms / 700 ms / 800 ms
– Relay connected with	**rocker 1 (obj. 3)** / rocker 2 (obj. 5) / rocker 3 (obj. 7) / rocker 4 (obj. 9) / rocker 5 (obj. 11)
Separate for each rocker:	
– Operation mode of rocker	no function shutter sensor dimming sensor **switch sensor**
for switch sensor operation mode:	
– Number of switch functions	**2 functions => 2 objects** 1 function => 1 object
if 1 function is selected:	
– Working mode of rocker	**TOGGLE** left = OFF, right = ON left = ON, right = OFF
– Operation mode of LED	orientation light **indicates object value**
for display of object value:	
– Colour of the LED	**OFF = green, ON = red** OFF = red, ON = green
for orientation light:	
– Colour of the LED	**always green** always red always OFF
if 2 functions are selected:	
– Working mode of rocker	**left = TOGGLE, right = TOGGLE** left = TOGGLE, right = OFF left = OFF, right = TOGGLE left = OFF, right = OFF left = TOGGLE, right = ON left = OFF, right = ON left = ON, right = TOGGLE left = ON, right = OFF left = ON, right = ON
– Operation mode of LED	orientation light **indicates object value**
for display of object value:	
– Colour of the LED	**OFF = green, ON = red** OFF = red, ON = green
for orientation light:	
– Colour of the LED	**always green** always red always OFF

for dimming sensor operation mode:	
– Dimming direction	**left = darker, right = brighter** left = brighter, right = darker
– Operation mode of LED	orientation light **indicates object value**
for display of object value:	
– Colour of the LED	**OFF = green, ON = red** OFF = red, ON = green
bei Orientierungslicht:	
– Colour of the LED	**always green** always red always OFF
for shutter sensor operation mode:	
– Shutter direction	**left = DOWN, right = UP** left = UP, right = DOWN
– Operation mode of LED	**orientation light** indicates object value
for display of object value:	
– Colour of the LED	**OFF = green, ON = red** OFF = red, ON = green
for orientation light:	
– Colour of the LED	a**lways green** always red always OFF
if no function is selected:	
– Operation mode of LED	orientation light **indicates object value**
for display of object value:	
– Colour of the LED	**OFF = green, ON = red** OFF = red, ON = green
for orientation light:	
– Colour of the LED	**always green** always red always OFF

IR LCD Switch Dim Shutter Lightscene /1.1



Selection in ETS2

– ABB
  └Push Button triton
    └Push button, 5-fold for 1SA

The application program is specifically for the 5-fold Busch-triton® switch sensor application module in connection with a flush-mounted switch actuator/sensor.

The Busch-triton® switch sensor can be used for switching, dimming and shutter control as well as for controlling lightscenes. Various parameters and communication objects can be used for the five rockers depending on the setting selected in the parameters “Number of lightscenes” and “Lightscenes are available”.

Four lightscenes are available in the default setting which can be retrieved via rockers 4 and 5. By changing the parameter “Lightscenes are available”, the other rockers can also be used for controlling lightscenes.

The rockers of the Busch-triton® switch sensor which are not used for controlling lightscenes each have the same set of parameters. With the parameter “Operation mode of the rocker”, the basic switching, dimming or shutter control function can be selected. Depending on this setting, different parameters and objects are available for the rockers. There is a common parameter “Push button action interpreted as long from” for all the rockers that are used for dimming or shutter control. Normally the switch sensor detects a long push button action if a rocker is pressed for longer than 400 ms.

Backlighting

The backlit text fields display the functions of the rockers even in the dark. Using the communication object “Backlighting/LED”, the backlighting and status LEDs can if required be switched on or off.

The auxiliary push button can also be used for manual switching. The parameter “Function of auxiliary push button” must be set to “Backlighting and LED on/off”. When the auxiliary push button is pressed, not only is the lighting of the switch sensor switched on or off but a telegram is sent via the communication object “Backlighting/LED”. It is therefore possible to switch on the lighting for several Busch-triton® switch sensors at the same time via a common group address.

By default, the backlighting switches on after bus voltage recovery. This can also be changed via the parameter “Behaviour of text field illumination...”.

Relay

Using the parameter “Relay connected with”, it is possible to control the relay locally using one of the rockers as well as via the bus. It is therefore possible to select one communication object that is used for switching, dimming or shutter control.

IR

In addition to using the rockers, the Busch-triton® switch sensor can also be controlled remotely via an infrared hand-held transmitter. The five rockers and the auxiliary push button can be assigned to the white or blue infrared area of the hand-held transmitter. The relevant setting must then be selected via the slide switch on the hand-held transmitter. The MEMO button on the transmitter corresponds to the function of the auxiliary push button on the Busch-triton® switch sensor.

LCD

When two lightscenes are used, the display of the Busch-triton® switch sensor can represent the values of three different communication objects. If four or six lightscenes are used, there are five communication objects available for the display.

In order to display switching states, relative variables such as brightness values, physical variables such as temperature values, the current time or date, it is possible to parameterise the object value for each LCD object from 1 bit to 3 bytes.

The input of the display text and several further settings is carried out using the Busch LCD management software. This software is available free of charge on the EIB CD-ROM/ diskette. The function of the software is described in the Software/ visualisation chapter. When entering the settings, you should ensure that the data (objects) of ETS2 and the display management software match.

Switch

In the default setting of the Busch-

triton® switch sensor, there are two 1 bit communication objects available for each of the rockers that are not used for lightscene control so that they can carry out switching operations. For simple applications, it is also possible to set the parameter “Number of switch functions” so that the rocker only has one communication object.

The parameter “Working mode of the rocker” determines which value the switch sensor sends when the left or the right side of the rocker is pressed.

Dim

If the operation mode of the rocker is set to “dimming sensor”, the rocker has the communication objects “Rocker ...
-short” for switching and “Rocker ...
-long” for dimming.

When carrying out a switching operation, the rocker can either be pressed on the left, on the right or in the middle. The switch sensor always toggles in this case.

For dimming, it is determined via the parameter “Dimming direction” which side of the rocker must be pressed and held down in order to dim up or down. When the rocker is released, the switch sensor sends the telegram “Stop dimming”.

Shutter

If the operation mode of the rocker is set to “shutter sensor”, the switch sensor sends “Move shutter up/down” telegrams when it is pressed for a long period on either the left or right hand side. If the rocker is pressed on either side for a short period, it sends “Adjust lamella/stop” telegrams.

The parameter “Shutter direction” determines which side of the rocker must be pressed in order to move the shutter up or down.

LED

If the backlighting of the text fields is switched on, the LEDs can be selected for use either as an orientation light or for status display with the parameter “Operation mode of LED”.

It is possible to assign the colours (red or green) of the object values “0” or “1” for the LEDs that are used for status display.

If used as an orientation light, the LED can either glow always red or always green or can also be switched off.

Lightscenes

In lightscene mode, up to six scenes with up to six different groups of actuators can be controlled without special lightscene modules.
The lightscenes can be preset via the device parameters. The user can then individually reassign parameters as required while the installation is in operation. The auxiliary push button is used for storing new lightscenes (parameters). To do this, the parameter “Function of auxiliary push button” must be set to “Storage of lightscenes”. To be able to use this function, the correct transmitting group addresses and flags must be assigned to the actuators.

The lightscenes are configured according to the following process.

1. The number of lightscenes and their respective rocker assignment can be set in the “General” parameter window.
2. For each of the groups of actuators A ... F, it must be determined with the parameter “Type of actuator group ...” whether they use 1 bit communication objects (switch or shutter actuators) or 8 bit communication objects (dimming actuators). Depending on this setting, the ETS2 program displays various parameters and communication objects. Communication objects 12 ... 17 are used for the control of actuator groups A ... F.
3. For each of the lightscenes, values can be preset for the actuator groups on their own parameter page.
4. The rockers that are not used for lightscenes are available for switching, dimming or shutter control. The parameter setting “no function/display operation” must be selected for unassigned rockers.

If a rocker is used for recalling lightscenes, the LED indicates which side of the rocker has been pressed. It glows green when the left side is pressed and red when the right side is pressed.

1-fold switch actuator/sensor, FM
Type: 6110 U-101-500 + 6325-xx

Application example:

Dimmable lamps are installed in the sleeping area of a hotel room and in the entrance of the room. There is also a switchable reading lamp near the bed. The room can be made darker using an electrically driven shutter. The light in the adjoining bathroom can be dimmed and a fan can be operated.

From the door, it should be possible to control the dimmable lamps in the sleeping area, entrance hall and bathroom separately. The fan is to be switched together with the light in the bathroom. In addition, it should be possible to operate the shutter.

Two lightscenes can be recalled with a push button action:
1. All the lamps are switched almost to maximum brightness and the shutter is raised when the room is being cleaned.
2. All the lamps are switched off and the shutters are raised when the occupant leaves the room.

From the bed, it should be possible to dim the lamps in the sleeping area and in the entrance hall and to switch the reading lamp. It should also be possible to operate the shutter.

Two lightscenes can be recalled with a push button action:
1. The lamps in the bathroom and the entrance hall are dimmed to semi brightness when the occupant is walking through the room at night and the reading lamp is switched off.
2. All the lamps are switched off when the occupant goes to sleep.

Two 5-fold Busch-triton® switch sensors each with a flush-mounted switch actuator/sensor, three switch/ dimming actuators and one shutter actuator are used.

The Busch-triton® switch sensor at the door has the following parameter settings:
Number of lightscenes:
  2
Lightscenes are available:
  Rocker 5
Function of auxiliary push button:
  no function
Operation mode of rocker 1:
  dimming sensor
Operation mode of rocker 2:
  dimming sensor
Operation mode of rocker 3:
  dimming sensor
Operation mode of rocker 4:
  shutter sensor
Operation mode of rocker 5:
  Rocker is assigned two lightscenes
IR area:
  no IR
Type of actuator group A:
  dimming actuator (8 bit)
Type of actuator group B:
  dimming actuator (8 bit)
Type of actuator group C:
  dimming actuator (8 bit)
Type of actuator group D:
  switch or shutter actuator (1 bit)
Type of actuator group E:
  switch or shutter actuator (1 bit)

The two lightscenes are defined as follows:
Lightscene 1: Base lighting
  Actuator group A: 80%,
  Actuator group B: 80%,
  Actuator group C: 80%,
  Actuator group D: ON,
  Actuator group E: UP
Lightscene 2: OFF
  Actuator group A: 0%,
  Actuator group B: 0%,
  Actuator group C: 0%,
  Actuator group D: OFF,
  Actuator group E: UP

The 1 bit and 4 bit communication objects of rockers 1 ... 3 are linked with the corresponding objects of the actuators for the lamps in the entrance hall, sleeping area and the bathroom.

The transmission flag is set for the switching objects of the dimming actuators. The status LEDs and the relay of the switch actuator/sensor can thus be controlled even when retrieving lightscenes.

The two objects of rocker 4 are linked with the corresponding objects of the shutter actuator.

The 1 byte communication objects of actuator groups A ... C are linked with the 1 byte objects of the dimming actuators. The 1 bit communication object of actuator group D is linked with the object of rocker 3 of the second switch sensor. The 1 bit communication object of actuator group E is linked with the object of the shutter actuator for raising/lowering the shutter.

The Busch-triton® switch sensor at the bed has the following parameter settings:
Number of lightscenes:
2
Lightscenes are available:
Rocker 5
Function of the auxiliary push button:
no function
Operation mode of rocker 1:
dimming sensor
Operation mode of rocker 2:
dimming sensor
Operation mode of rocker 3:
switch sensor,
1 function => 1 object,
working mode TOGGLE
Operation mode of rocker 4:
shutter sensor
Operation mode of rocker 5:
Rocker is assigned two lightscenes
IR area:
no IR
Type of actuator group A:
dimming actuator (8 bit)
Type of actuator group B:
dimming actuator (8 bit)
Type of actuator group C:
dimming actuator (8 bit)
Type of actuator group D:
switch or shutter actuator (1 bit)
Type of actuator group E:
switch or shutter actuator (1 bit)

The two lightscenes are defined as follows:
Lightscene 1: Passage lighting
Actuator group A: 40%,
Actuator group B: 0%,
Actuator group C: 40%,
Actuator group D: OFF
Lightscene 2: OFF
Actuator group A: 0%,
Actuator group B: 0%,
Actuator group C: 0%,
Actuator group D: OFF

The 1 bit and 4 bit communication objects of rockers 1 and 2 are linked with the corresponding objects of the actuators for the lamps in the entrance hall and the sleeping area.

The transmission flag is set for the switching objects of the dimming actuators. The status LEDs can thus be controlled even when retrieving lightscenes.

The communication object of rocker 3 is linked with the objects of actuator group D for the two switch sensors.

The two objects of rocker 4 are linked with the corresponding objects of the shutter actuator.

The 1 byte communication objects of actuator groups A and C are linked with the 1 byte objects of the dimming actuators. The 1 bit communication object of actuator group D is linked with the object of rocker 3 of the second switch sensor. The 1 bit communication object of actuator group E is not required by this switch sensor so that the hotel guest can freely decide whether he wants to sleep with the shutter open or closed.

In this case the auxiliary push buttons are not used for storing lightscenes so that hotel guests do not unintentionally change the set lightscenes. The read flags should therefore not be set for the communication objects that are used for shutter control in both sensors and the actuator. This prevents the shutter from being accidentally set in motion if there is ever a requirement to parameterise the lightscenes locally.

Communication objects
for switch sensor with two switch functions, 3 byte object value and 4 lightscenes on rockers 4 and 5

No.	Type	Object name	Function
0	1 bit	LCD object 0	Switch
1	1 bit	LCD object 1	Switch
2	1 bit	LCD object 2	Switch
3	1 bit	LCD object 3	Switch
4	1 bit	LCD object 4	Switch
5	1 bit	Backlighting/LED	Switch
6	1 bit	Rocker 1 left	Telegr. switch
7	1 bit	Rocker 1 right	Telegr. switch
8	1 bit	Rocker 2 left	Telegr. switch
9	1 bit	Rocker 2 right	Telegr. switch
10	1 bit	Rocker 3 left	Telegr. switch
11	1 bit	Rocker 3 right	Telegr. switch
12	1 bit	Actuator group A	Telegr. switch
13	1 bit	Actuator group B	Telegr. switch
14	1 bit	Actuator group C	Telegr. switch
15	1 bit	Actuator group D	Telegr. switch
16	1 bit	Actuator group E	Telegr. switch
17	1 bit	Actuator group F	Telegr. switch

Communication objects
for switch sensor with two switch functions and 2 lightscenes on rocker 5

No.	Type	Object name	Function
...			
3	1 bit	Backlighting/LED	Switch
4	1 bit	Rocker 1 left	Telegr. switch
5	1 bit	Rocker 1 right	Telegr. switch
6	1 bit	Rocker 2 left	Telegr. switch
7	1 bit	Rocker 2 right	Telegr. switch
8	1 bit	Rocker 3 left	Telegr. switch
9	1 bit	Rocker 3 right	Telegr. switch
10	1 bit	Rocker 4 left	Telegr. switch
11	1 bit	Rocker 4 right	Telegr. switch
...			

Communication objects
for switch sensor with two switch functions and 6 lightscenes on rockers 1 to 3

No.	Type	Object name	Function
...			
7	1 bit	Backlighting/LED	Switch
8	1 bit	Rocker 3 left	Telegr. switch
9	1 bit	Rocker 3 right	Telegr. switch
10	1 bit	Rocker 4 left	Telegr. switch
11	1 bit	Rocker 4 right	Telegr. switch
...			

Communication objects
for 4 lightscenes on rockers 4 and 5 with dimming actuator

No.	Type	Object name	Function
...			
12	1 byte	Actuator group A	Telegr. brightness value
13	1 byte	Actuator group B	Telegr. brightness value
14	1 byte	Actuator group C	Telegr. brightness value
15	1 byte	Actuator group D	Telegr. brightness value
16	1 byte	Actuator group E	Telegr. brightness value
17	1 byte	Actuator group F	Telegr. brightness value

Communication objects
for switch sensor with one switch function and 4 lightscenes on rockers 4 and 5

No.	Type	Object name	Function
...			
5	1 bit	Backlighting/LED	Switch
6	1 bit	Rocker 1	Telegr. switch
8	1 bit	Rocker 2	Telegr. switch
10	1 bit	Rocker 3	Telegr. switch
...			

Communication objects
for dimming sensor and 4 lightscenes on rockers 4 and 5

No.	Type	Object name	Function
...			
6	1 bit	Rocker 1 -short	Telegr. switch
7	4 bit	Rocker 1 -long	Telegr. dimming
8	1 bit	Rocker 2 -short	Telegr. switch
9	4 bit	Rocker 2 -long	Telegr. dimming
10	1 bit	Rocker 3 -short	Telegr. switch
11	4 bit	Rocker 3 -long	Telegr. dimming
...			

Communication objects
for shutter sensor and 4 lightscenes on rockers 4 and 5

No.	Type	Object name	Function
...			
6	1 bit	Rocker 1 -short	Telegr. move shutter Up-Down
7	1 bit	Rocker 1 -long	Telegr. lamella adj./stop
8	1 bit	Rocker 2 -short	Telegr. move shutter Up-Down
9	1 bit	Rocker 2 -long	Telegr. lamella adj./stop
10	1 bit	Rocker 3 -short	Telegr. move shutter Up-Down
11	1 bit	Rocker 3 -long	Telegr. lamella adj./stop
...			

Communication objects
for 1 bit (switch) LCD object value

No.	Type	Object name	Function
0	1 bit	LCD object 0	Switch
1	1 bit	LCD object 1	Switch
2	1 bit	LCD object 2	Switch
3	1 bit	LCD object 3	Switch
4	1 bit	LCD object 4	Switch
...			

Communication objects
for 1 byte (value) LCD object value

No.	Type	Object name	Function
0	1 byte	LCD object 0	Value
1	1 byte	LCD object 1	Value
2	1 byte	LCD object 2	Value
3	1 byte	LCD object 3	Value
4	1 byte	LCD object 4	Value
…			

Communication objects
for 2 byte (value) LCD object value

No.	Type	Object name	Function
0	2 byte	LCD object 0	Value
1	2 byte	LCD object 1	Value
2	2 byte	LCD object 2	Value
3	2 byte	LCD object 3	Value
4	2 byte	LCD object 4	Value
…			

Communication objects
for 3 byte (time/date) LCD object value

No.	Type	Object name	Function
0	3 byte	LCD object 0	Time/date
1	3 byte	LCD object 1	Time/date
2	3 byte	LCD object 2	Time/date
3	3 byte	LCD object 3	Time/date
4	3 byte	LCD object 4	Time/date
…			

Parameters
The default setting for the values is **printed in bold type.**

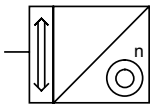
General:	
– Object for backlighting switches	**text field and status LED** only text field LED
– Behaviour of text field illumination after bus voltage recovery	**ON** OFF
– Function of auxiliary push button	no function / display operation **storage of lightscenes**
– Number of lightscenes	2 / **4** / 6
if 2 lightscenes are selected:	
– Lightscenes are available	Rocker 1 Rocker 2 Rocker 3 Rocker 4 **Rocker 5**
if 4 lightscenes are selected:	
– Lightscenes are available	Rockers 1 and 2 Rockers 2 and 3 Rockers 3 and 4 **Rockers 4 and 5**
if 6 lightscenes are selected:	
– Lightscenes are available	**Rockers 1 to 3** Rockers 2 to 4 Rockers 3 to 5
– Waiting time between telegrams when activating lightscenes (140 ms)	**0**
– IR area	blue **white** no IR
– Push button action interpreted as long from	280 ms / **420 ms** / 560 ms / 700 ms / 800 ms
if 2 lightscenes are selected:	
– Relay connected with	Object 4 Object 6 Object 8 Object 10
if 4 lightscenes are selected:	
– Relay connected with	Object 6 Object 8 Object 10
if 6 lightscenes are selected:	
– Relay connected with	Object 8 Object 10
Separate for each rocker:	
if lightscenes are assigned:	
– Rocker is assigned two lightscenes	**<— NOTE**
if no lightscenes are assigned:	
– Operation mode of rocker	no function / display operation shutter sensor dimming sensor **switch sensor**

for switch sensor operation mode:	
– Number of switch functions	**2 functions => 2 objects** 1 function => 1 object
if 1 function is selected:	
– Working mode of rocker	**TOGGLE** left = OFF, right = ON left = ON, right = OFF
if 2 functions are selected:	
– Working mode of rocker	**left = TOGGLE, right = TOGGLE** left = TOGGLE, right = OFF left = OFF, right = TOGGLE left = OFF, right = OFF left = TOGGLE, right = ON left = OFF, right = ON left = ON, right = TOGGLE left = ON, right = OFF left = ON, right = ON
for dimming sensor operation mode:	
– Dimming direction	**left = darker, right = brighter** left = brighter, right = darker
for shutter sensor operation mode:	
– Shutter direction	**left = DOWN, right = UP** left = UP, right = DOWN
– Operation mode of LED	orientation light **indicates object value**
for display of object value:	
– Colour of theLED	**OFF = green, ON = red** OFF = red, ON = green
for orientation light:	
– Colour of the LED	**always green** always red always OFF

Actuator types:	
Separate for each actuator group:	
– Type of actuator group A ... F	**switch or shutter actuator (1 bit)** dimming actuator (8 bit)
Separate for each lightscene:	
for switch or shutter actuator:	
– Preset actuator group A ... F	**OFF / UP** ON / DOWN
for dimming actuator:	
– Preset actuator group A ... F	**0 %** / 5 % / ... / 95 % / 100 %

Display:	
Separate for each LCD object:	
– Type of LCD object no. 0 ... 4	**3 byte (time/date)** 2 byte (value) 1 byte (value) 1 bit (switch)

IR LCD Switch Dim Shutter /2



Selection in ETS2

– ABB
  └Push Button triton
    └Push button, 5-fold for 1SA

The application program is specifically for the 5-fold Busch-triton® switch sensor application module in connection with a flush-mounted switch actuator/sensor.

The Busch-triton® switch sensor can be used for switching, dimming as well as for shutter control.

The rockers of the Busch-triton® switch sensor each have the same set of parameters. With the parameter “Operation mode of rocker”, the basic switch, dimming or shutter control function can be selected. Depending on this setting, different parameters and objects are available for the rockers. There is a common parameter “Push button action interpreted as long from” for all the rockers that are used for dimming or shutter control. Normally the switch sensor detects a long push button action if a rocker is pressed for longer than 400 ms.

Fault protection

The fault protection function causes only one basic function to be triggered when any of the rockers of the switch sensor are pressed. For example, pressing one of the three rockers via communication object no. 1 “Fault protection” switches the base lighting alternately on or off.

The fault protection system can be permanently activated or for example be timed to switch on or off via the EIB using object no. 0 “Fault protection Off/On”. If the parameter “Function of auxiliary push button” is set to “Interrupt fault protection”, the five rockers can be used according to their respective parameter settings after pressing the auxiliary push button.

Backlighting

The backlit text fields display the functions of the rockers even in the dark. Using the communication object “Backlighting/LED”, the backlighting and status LEDs can if required be switched on or off.

The auxiliary push button can also be used for manual switching. The parameter “Function of auxiliary push button” must be set to “Backlighting and LED on/off”. When the auxiliary push button is pressed, not only is the lighting of the switch sensor switched on or off but a telegram is sent via the communication object “Backlighting/LED”. It is therefore possible to switch on the lighting for several Busch-triton® switch sensors at the same time via a common group address.

By default, the backlighting switches on after bus voltage recovery. This can also be changed via the parameter “Behaviour of text field illumination...”.

IR

In addition to using the rockers, the Busch-triton® switch sensor can also be controlled remotely via an infrared hand-held transmitter. The five rockers and the auxiliary push button can be assigned to the white or blue infrared area of the hand-held transmitter. The relevant setting must then be selected via the slide switch on the hand-held transmitter. The MEMO button on the transmitter corresponds to the function of the auxiliary push button on the Busch-triton® switch sensor.

Relay

Using the parameter “Relay connected with”, it is possible to control the relay locally using one of the rockers as well as via the bus. It is therefore possible to select one communication object that is used for switching, dimming or shutter control.

LCD

The display of the Busch-triton® switch sensor can represent the values of five different communication objects.

In order to display switching states, relative variables such as brightness values, physical variables such as temperature values, the current time or date, it is possible to parameterise the object value for each LCD object from 1 bit to 3 bytes.

If more than one piece of text is to be displayed, it is possible to exchange the text messages either automatically or after a fixed period or on receipt of a new telegram or by manually pressing a push button (scrolling).

The input of the display text and several further settings is carried out using the Busch LCD management software. This software is available free of charge on the EIB CD-ROM/ diskette. The function of the software is described in the Software/ visualisation chapter. When entering the settings, you should ensure that the data (objects) of ETS2 and the display management software match.

Switch

In the default setting of the Busch-triton® switch sensor, there are two 1 bit communication objects available for the rockers for switching. For simple applications, it is also possible to set the parameter “Number of switch functions” so that the rocker only has one communication object.

The parameter “Working mode of the rocker” determines which value the switch sensor sends when the left or the right side of the rocker is pressed.

Dim

If the operation mode of the rocker is set to “dimming sensor”, the rocker has the communication objects “Rocker ...
-short” for switching and “Rocker ...
-long” for dimming.

When carrying out a switching operation, the rocker can either be pressed on the left, on the right or in the middle. The switch sensor always toggles in this case.

For dimming, it is determined via the parameter “Dimming direction” which side of the rocker must be pressed and held down in order to dim up or down. When the rocker is released, the switch sensor sends the telegram “Stop dimming”.

Shutter

If the operation mode of the rocker is set to “shutter sensor”, the switch sensor sends “Move shutter up/down” telegrams when it is pressed for a long period on either the left or right hand side. If the rocker is pressed on either side for a short period, it sends “Adjust lamella/stop” telegrams.

The parameter “Shutter direction” determines which side of the rocker must be pressed in order to move the shutter up or down.

LED

If the backlighting of the text fields is switched on, the LEDs can be selected for use either as an orientation light or for status display with the parameter “Operation mode of LED”.

It is possible to assign the colours (red or green) of the object values “0” or “1” for the LEDs that are used for status display.

If used as an orientation light, the LED can either glow always red or always green or can also be switched off.

1-fold switch actuator/sensor, FM
Type: 6110 U-101-500 + 6325-xx

Application example:

In a lecture theatre, there is one group of dimmable downlighters above the seminar participants, one group of dimmable spotlights above the lecture area and two groups of switchable wall floodlights. The room can be made darker using two electrically driven shutter motors.

The seminar participants are normally only able to switch the lights on and off.

Two 5-fold Busch-triton® switch sensors with switch actuator/sensors, two dimming actuators and and two shutter actuators are used.

The two Busch-triton® switch sensors at the doors have almost identical parameter settings:
Function of auxiliary push button:
interrupt fault protection
Operation mode of rocker 1:
switch sensor,
2 functions,
left = TOGGLE, right = TOGGLE
Operation mode of LED:
indicates object value
Colour of LED:
OFF = green, ON = red
Operation mode of rocker 2:
dimming sensor
Operation mode of LED:
indicates object value
Colour of LED:
OFF = green, ON = red
Operation mode of rocker 3:
dimming sensor
Operation mode of LED:
indicates object value
Colour of LED:
OFF = green, ON = red
Operation mode of rocker 4:
shutter sensor
Operation mode of LED:
orientation light
Colour of LED:
always OFF
Operation mode of rocker 5:
shutter sensor
Operation mode of LED:
orientation light
Colour of LED:
always OFF

The parameter “IR area” is set differently for the two switch sensors so that they do not both send telegrams when using remote control.

The relays of the switch actuators/ sensors each switch one group of wall floodlights.

The connection of group addresses to the communication objects is almost identical. Only the two objects for rocker 1 are linked with the other objects of the other switch sensor. It is therefore possible to switch both groups of wall floodlights separately when the fault protection function is deactivated.

The 1 bit communication object no. 1 “Fault protection” of the auxiliary push button is linked with the 1 bit communcation objects “Rocker 1 left” for both switch sensors. When the fault protection function is active, generally both groups of wall floodlights are switched.

The 1 bit and 4 bit communication objects of rockers 1 and 2 are linked with the corresponding objects of the two dimming actuators.

The communication objects of rockers 4 and 5 for raising and lowering the shutters and for lamella adjustment are linked with the corresponding objects of the shutter actuators.

In general the switch sensor operates with an active fault protection system. The wall floodlights are switched each time any of the rockers is pressed.

The lecturer can execute the same functions via remote control. The IR area can be set as required as both switch sensors react to different settings but carry out the same functions.

Communication objects
for switch sensor with two switch functions without fault protection

No.	Type	Object name	Function
2	1 bit	Backlighting/LED	Switch
3	1 bit	Rocker 1 left	Telegr. switch
4	1 bit	Rocker 1 right	Telegr. switch
5	1 bit	Rocker 2 left	Telegr. switch
6	1 bit	Rocker 2 right	Telegr. switch
7	1 bit	Rocker 3 left	Telegr. switch
8	1 bit	Rocker 3 right	Telegr. switch
9	1 bit	Rocker 4 left	Telegr. switch
10	1 bit	Rocker 4 right	Telegr. switch
11	1 bit	Rocker 5 left	Telegr. switch
12	1 bit	Rocker 5 right	Telegr. switch
13	3 byte	LCD object 13	Time/date
14	3 byte	LCD object 14	Time/date
15	3 byte	LCD object 15	Time/date
16	3 byte	LCD object 16	Time/date
17	3 byte	LCD object 17	Time/date

Communication objects
with fault protection

No.	Type	Object name	Function
0	1 bit	Input telegr.	Fault protection Off/On
1	1 bit	Fault protection	Telegr. switch
...			

Communication objects
for switch sensor with one switch function

No.	Type	Object name	Function
...			
3	1 bit	Rocker 1	Telegr. switch
5	1 bit	Rocker 2	Telegr. switch
7	1 bit	Rocker 3	Telegr. switch
9	1 bit	Rocker 4	Telegr. switch
11	1 bit	Rocker 5	Telegr. switch
...			

Communication objects
for dimming sensor

No.	Type	Object name	Function
...			
3	1 bit	Rocker 1 -short	Telegr. switch
4	4 bit	Rocker 1 -long	Telegr. dimming
5	1 bit	Rocker 2 -short	Telegr. switch
6	4 bit	Rocker 2 -long	Telegr. dimming
7	1 bit	Rocker 3 -short	Telegr. switch
8	4 bit	Rocker 3 -long	Telegr. dimming
9	1 bit	Rocker 4 -short	Telegr. switch
10	4 bit	Rocker 4 -long	Telegr. dimming
11	1 bit	Rocker 5 -short	Telegr. switch
12	4 bit	Rocker 5 -long	Telegr. dimming
...			

Communication objects
for shutter sensor

No.	Type	Object name	Function
...			
3	1 bit	Rocker 1 -long	Telegr. move shutter Up-Down
4	1 bit	Rocker 1 -short	Telegr. lamella adj./stop
5	1 bit	Rocker 2 -long	Telegr. move shutter Up-Down
6	1 bit	Rocker 2 -short	Telegr. lamella adj./stop
7	1 bit	Rocker 3 -long	Telegr. move shutter Up-Down
8	1 bit	Rocker 3 -short	Telegr. lamella adj./stop
9	1 bit	Rocker 4 -long	Telegr. move shutter Up-Down
10	1 bit	Rocker 4 -short	Telegr. lamella adj./stop
11	1 bit	Rocker 5 -long	Telegr. move shutter Up-Down
12	1 bit	Rocker 5 -short	Telegr. lamella adj./stop
...			

No.	Type	Object name	Function
...			
13	1 bit	LCD object 13	Switch
14	1 bit	LCD object 14	Switch
15	1 bit	LCD object 15	Switch
16	1 bit	LCD object 16	Switch
17	1 bit	LCD object 17	Switch

No.	Type	Object name	Function
...			
13	1 byte	LCD object 13	Value
14	1 byte	LCD object 14	Value
15	1 byte	LCD object 15	Value
16	1 byte	LCD object 16	Value
17	1 byte	LCD object 17	Value

No.	Type	Object name	Function
...			
13	2 byte	LCD object 13	Value
14	2 byte	LCD object 14	Value
15	2 byte	LCD object 15	Value
16	2 byte	LCD object 16	Value
17	2 byte	LCD object 17	Value

No.	Type	Object name	Function
...			
13	3 byte	LCD object 13	Time/date
14	3 byte	LCD object 14	Time/date
15	3 byte	LCD object 15	Time/date
16	3 byte	LCD object 16	Time/date
17	3 byte	LCD object 17	Time/date

General:	
– Object for backlighting switches	**text field and status LED** only text field LED
– Behaviour of text field illumination after bus voltage recovery	**ON** OFF
– Function of auxiliary push button	no function / display operation interrupt fault protection (approx. 5s) **text field and status LED on/off**
– IR area	blue **white** no IR
– Push button action interpreted as long from	280 ms / **420 ms** / 560 ms / 700 ms / 800 ms
– Relay connected with	**Object 3** / Object 5 / Object 7 / Object 9 / Object 11
Separate for each rocker:	
– Operation mode of rocker	no function / display operation shutter sensor dimming sensor **switch sensor**
for switch sensor operation mode:	
– Number of switch functions	**2 functions => 2 Objekte** 1 Funktion => 1 Objekt
if 1 function is selected:	
– Working mode of rocker	**TOGGLE** left = OFF, right = ON left = ON, right = OFF
– Operation mode of LED	orientation light **indicates object value**
for display of object value:	
– Colour of the LED	**OFF = green, ON = red** OFF = red, ON = green
for orientation light:	
– Colour of the LED	**always green** always red always OFF
if 2 functions are selected:	
– Working mode of rocker	**left = TOGGLE, right = TOGGLE** left = TOGGLE, right = OFF left = OFF, right = TOGGLE left = OFF, right = OFF left = TOGGLE, right = ON left = OFF, right = ON left = ON, right = TOGGLE left = ON, right = OFF left = ON, right = ON
– Operation mode of LED	orientation light **indicates object value**
for display of object value:	
– Colour of the LED	**OFF = green, ON = red** OFF = red, ON = green
for orientation light:	
– Colour of the LED	**always green** always red always OFF

for dimming sensor operation mode:	
– Dimming direction	**left = darker, right = brighter** left = brighter, right = darker
– Operation mode of LED	orientation light **indicates object value**
for display of object value:	
– Colour of the LED	**OFF = green, ON = red** OFF = red, ON = green
for orientation light:	
– Colour of the LED	**always green** always red always OFF

for shutter sensor operation mode:	
– Shutter direction	**left = DOWN, right = UP** left = UP, right = DOWN
– Operation mode of LED	**orientation light** indicates object value
for display of object value:	
– Colour of the LED	**OFF = green, ON = red** OFF = red, ON = green
for orientation light:	
– Colour of the LED	**always green** always red always OFF

if no function / display operation is selected:
– no setting options

Display:	
Separate for each LCD object:	
– Type of LCD object no. …	1 bit 1 byte 2 byte **3 byte (time/date)**