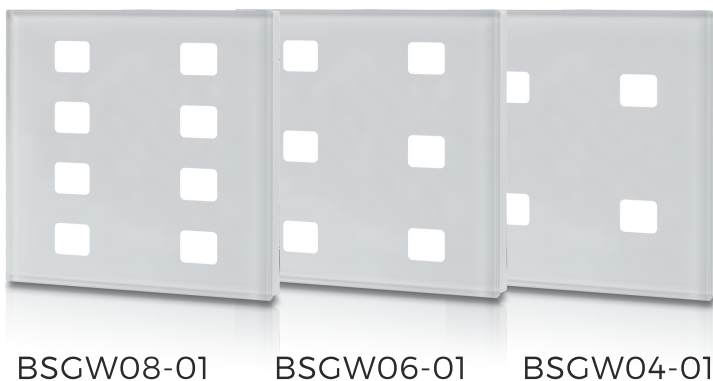


# TECHNICAL DOCUMENT

## KNX SWITCHES

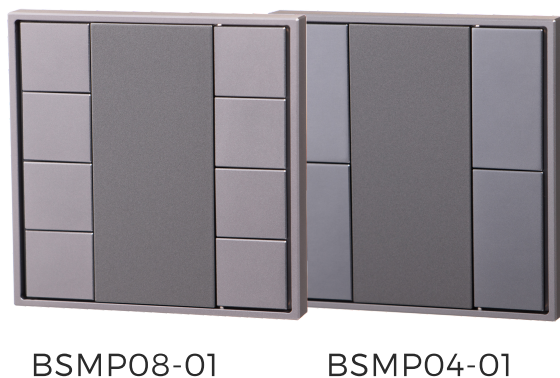
### Aesthete Clear Touch



### Zenith



### Ore



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## 1. SUMMARY

The push button is used in building control systems. At the same time, the application module can be also connected with other devices for a system on the bus, and the functions are both simple to operation and intuitive. Users can program it according to the requirement to implement the function systematically.

This manual provides detailed technical information about the push button for users as well as assembly and programming details, and explains how to use the push button by the application examples.

The push button can be used to control the switch, dimming, blinds, and RTC, etc. Each button correspond one LED with 2 colors indication.

The push button connected bus via EIB connection terminals and has no use for additional supply voltage. It is available to assign the physical address and set the parameters by Engineering design tools ETS with VD4 (higher than edition ETS3).

The push button has a lot of functions that can be used in a wide variety of application areas.

The following list provides an overview:

- > switching and dimming function
- > control of blinds and shutters
- > sending of values, e.g. water line>rightness.
- > recall and storage scene function
- > step-type switch function
- > setting the RTC operation mode
- > Multiple operation
- > LED indication function

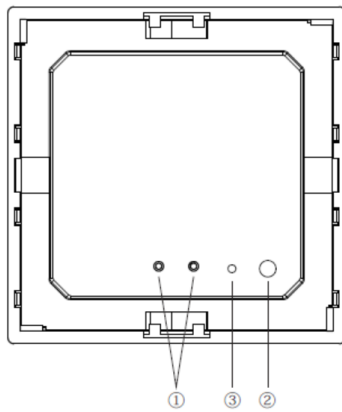
Each button of a device can adopt any of the functions described above, and is independent of each other. Almost each function has two operating modes, one is that the function differentiates between whether the rocker switch is operated on the left or right side, the other is that the function does not differentiate between whether the rocker switch is operated on the left and right side.

## 2. TECHNICAL DATA

Power supply	Bus voltage	21-30V DC, via the EIB bus
	Current consumption, bus	<12mA
	Power consumption, bus	<360mW
Operating and display	LED indication for each button	The LEDs have 2 colors
	Programming LED and button	For assignment of the physical address
Number of button operation	>20000	
connections	EIB/KNX	Via bus connection terminal
Protection class	IP 20	To DIN EN 60 529
Safety class	II	To DIN EN 61 140
Temperature rang	Operation	- 5 °C ... 45 °C
	Storage	- 25 °C ... 55 °C
	Transport	- 25 °C ... 70 °C
Design	Embedded installation of equipment	
	Dimensions	
Installation	in a 86 mm wiring box	
Weight		
Housing/color	Plastic housing, white	
Approvals	EIB/KNX certificate	
CE mark	In accordance with the EMC guideline	
Halogen free	Conform to DIN VDE 0472-815	

### 3. CIRCUIT AND DIMENSION DIAGRAM

#### 3.1 CIRCUIT DIAGRAM



- 1. KNX Bus
- 2. Programming key
- 3. Programming indicator

#### 3.2 DIMENSION DIAGRAM



## 4. PROJECT DESIGN AND PROGRAMMING

### 4.1 OVERVIEW OF THE FUNCTIONS

Application program	Max. number of communication objects	Max. number of group addresses	Max. number of associations
KN9551-KXX Push-button 4-gang	64	128	128

The following applications can be set separately for each rocker switch of the push button:

#### **Switch**

The application can be used for switching the lighting, such as relay, dimmer, etc. With the application, an operation of the right or left side of the rocker switch sends out a switching command. Or an operation or upon release of the rocker switch sends out a switching command.

#### **Switch / Dimming**

The application can be used for switching/dimming the lighting and is distinguish between long and short operation. The manner of dimming can be selected between start-stop dimming and step-wise dimming. With the application, an operation of the right or left side of the rocker switch sends out a switching command or a dimming command. Or a short operation will execute switching and a long operation will execute dimming for the rocker switch.

#### **Blind and shutter**

The application can make shutter or roller blind movement or louvre adjustment, and there is distinguish between long and short operation, a short operation will execute movement and a long operation will execute adjustment/stop for the rocker switch.

#### **Value sender**

The application can be used for sending the different values or data types. With the application, an operation of the right and left side of the rocker switch send out the different values. Or an operation and upon release of the rocker switch send out the different values or data types.

#### **Value dimming**

With the application, each operation of the right or left side of the rocker switch will increase or reduce a 1-byte value (percent or value from 0 to 127) via sending a 1-byte telegram. The 1-byte value can be connected with 1-byte brightness value objects from dimming actuators. Thus a dimming actuator can be dimmed brighter or darker.

**Light scene control with storage function**

With the application, a short operation will recall a scene and a long operation will storage the current scene for the rocker switch.

**Step-type switch**

The application is used to trigger different switching processed with each new operation of the rocker switch. Up to four switching levels can be activated. An operation of the right or left side of the rocker switch makes switching processed change to a stage higher or a stage lower. Or a short operation of the rocker switch will make switching processed change to a next level forward and a long operation will make switching processed back to the first level from every position.

**Short-long operation**

With the application, the different values can be sent out by a short operation or a long operation for the rocker switch.

**RTC operation mode**

The application can be used for adjusting the room thermostat. According to room temperature, humidity, refrigeration cycle, etc. you can switch to a different working mode, such as comfort, standby, night, freeze protection, or high temperature protection.

**Multiple operation**

The function can realize send out more than one objects(MAX 5), so it can do some special scene.

**LED function**

LED can be used for status display or for the function display. The LED can light up in different colors and can also flash for alarm display.

from dimming actuators. Thus a dimming actuator can be dimmed brighter or darker.

**5.PARAMETER SETTING DESCRIPTION IN THE ETS****5.1 PARAMETER WINDOW “GENERAL”**

Parameter window “General setting” can be shown in fig. 5.1. There used to set the working mode for each rocker switch, the rocker switch can be used as two independent push button or linked push button. If the rocker switch is used as two independent push button, the application is independent each other for the two independent. If as linked push button, the application is associated.



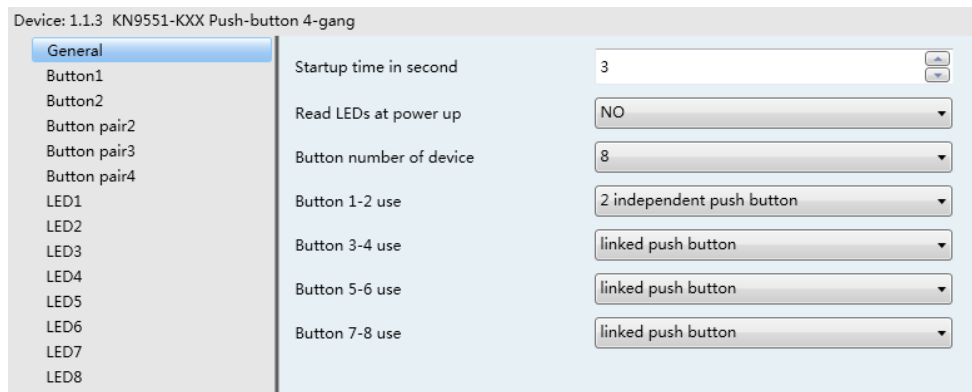


Figure 5.1 parameter window "General"

**"Startup time in second"**

This parameter is used to set the startup time of device. Options:1...60

**"Read LEDs at power up"**

This parameter can decide whether read LED when power on. Options: YES/NO

**"Button number of device"**

This parameter is used to set the number of device.

**"Button 1-2/3-4 use"**

This parameter is used to set the working mode for each rocker switch. Options:

2 independent push buttons

Linked push button

If selecting "2 independent push buttons", the left and right side of the rocker switch are used as two independent push buttons, and the application does not differentiate between whether the rocker switch is operated on the left and right side.

If selecting "linked push button", the left and right side of the rocker switch are used as linked push button, and the application differentiates between whether the rocker switch is operated on the left and right side.

The following sections details parameters and communication objects of each application in the two working modes, using one push button or one rocker switch as an example.

## 5.2 INDEPENDENT WORKING MODE

In the independent working mode, the applications do not differentiate between whether the rocker switch is operated on the left and right side. In each case, the applications make a separate set of parameters and communication objects available for the light and left side of the rocker switch. For example, a switching function can be realized via a rocker switch side while the other rocker switch side can be assigned with an additional "button orientated" function.

### 5.2.1 “SWITCHING”

Parameter window “Switching” can be shown in fig. 5.2. With the application, a switching telegram is sent out for an operation or upon release of the rocker switch.

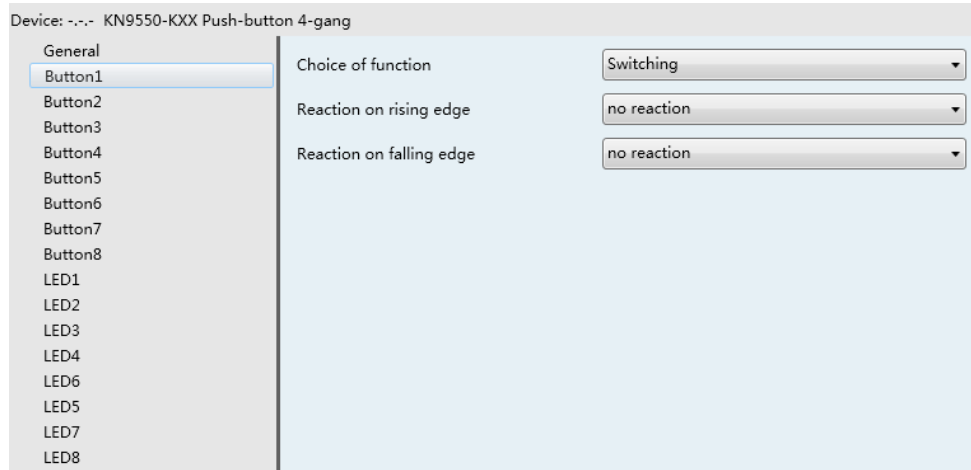


Figure 5.2 “Switching” window

#### “Reaction on rising edge”/“Reaction on falling edge”

Via the parameters you can set which 1-bit value is sent out for every operation on rising edge and falling edge. This can be an ON telegram, an OFF telegram or a toggle telegram. Alternatively, no telegram can be sent out for a rocker switch operation using the “No reaction” setting. Options:

No reaction

On

Off

Alternating on/off

“Alternating on/off” means that switching is always between ON and OFF. For example, if an ON telegram was last sent out, then a renewed operation of the rocker switch will trigger an OFF telegram. When the rocker switch is operated again, an ON telegram is sent out, etc. The rocker switch thus always remembers the last state and then switches over to the other value.

#### “switching”, 1bit

According to the parameter setting, the object is used to send out an ON telegram or an OFF telegram, or a toggle telegram via an operation or the releasing of the rocker switch.

### 5.2.2 “DIMMING” FUNCTION

Parameter window “Dimming” can be shown in fig. 5.3. With the application, a rocker switch has two communication objects for switching and for dimming. A distinction is made between short operation and long operation. A short operation will execute switching; a long operation will execute dimming.

A “switching” switching telegram is sent out on the 1-bit communication object. A “relative dimming” dimming telegram is sent out on the 4-bit communication object.

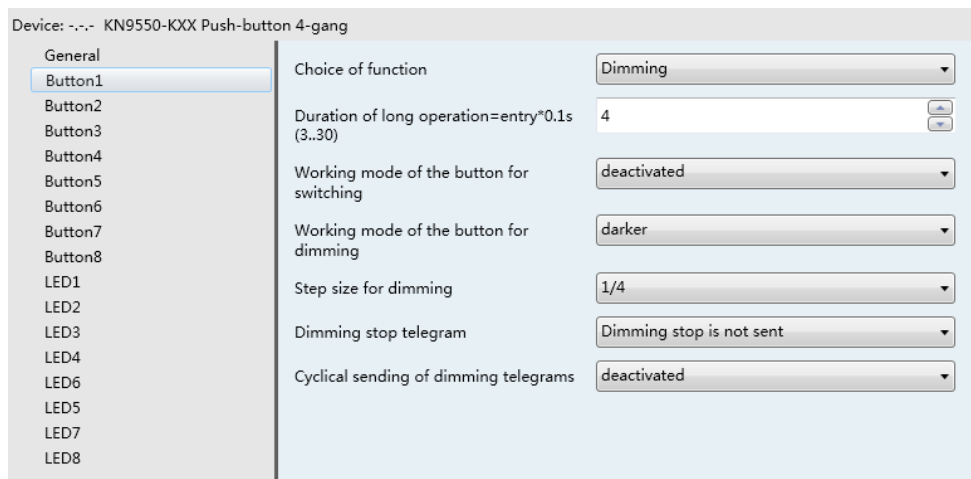


Figure 5.3 “Dimming” window

#### “duration of long operation=entry×0.1s” (3...30)

The parameter is used to define the time which a long operation is recognized. Options:3~30

#### “working mode of the push button for switching”

This parameter is used to determine whether a short operation sends out an ON or an OFF telegram via a 1-bit communication object. Alternatively, for the selection “alternating on/off”, you can switch between switching on and switching off for every short operation, i.e. after a switch-on telegram has been sent out (or received), a switch-off telegram will be sent out for a renewed operation. After it is operated again, a switching-on telegram is sent out. Options:

- Deactivated
- Off
- On
- Alternating on/off

#### “working mode of the push button for dimming”

This parameter is used to determine whether a long operation sends out a dim brighter or a dim darker telegram via a 4-bit communication object. Alternatively, for the selection “alternating brighter/darker”, you can switch between dimming up and dimming darker for every long operation, i.e. after a dim brighter telegram has been sent out (or received), a dim darker telegram will be sent out for a renewed operation. After it is operated again, a dim brighter telegram is sent out. Options:

- Darker
- Bright
- Alternating brighter/ darker

**“step size for dimming”**

The parameter is used to specify by how much brighter or darker dimming should occur. The sent out value always relates to the current brightness value. For example, a dimming actuator is currently dimmed to a brightness value of 70%. By operation of the rocker switch, a dimming command “dim by 25% (1/4) brighter” is sent out. The dimming actuator will adjust its brightness value to 95% immediately after receiving the dimming command. Options:

1/1 , 1/2, 1/4, ..., 1/32, 1/64

**“dimming stop telegram”**

The parameter is used to determine whether the release of the rocker switch will trigger the “dimming stop” command or not. Options:

Dimming stop is send

Dimming stop is not send

With the “dimming stop is send” option, when the rocker switch is released, the telegram with the “dimming stop” information is sent out on the 4-bit communication object “relative dimming”.

**“cyclical sending of dimming telegrams”**

The parameter is used to determine the telegram with the “brighter” or “darker” information whether is sent out cyclically by a durative long operation. Options:

Deactivated

Activated

With the “deactivated” option, when triggered a durative long operation, only one telegram with the “brighter” or “darker” information is sent out on the 4-bit communication object “relative dimming”.

With the “activated” option, when triggered a durative long operation, the telegram with the “brighter” or “darker” information is sent out cyclically on the 4-bit communication object “relative dimming”.

**“Duration of the telegram repetitions=entry×0.1 s (3...30)”**

The parameter is only visible if the “cyclical sending of dimming telegrams” parameter is set to “activated”. It is used to set the interval time between two telegrams that are sent cyclically, options: 3~30

**“switching”, 1bit**

According to the parameter setting, the object is used to send out an ON telegram or an OFF telegram, or a toggle telegram via a short operation of the rocker switch.

**“relative dimming”, 4bit**

According to the parameter setting, the object is used to send out a dim brighter or a dim darker telegram via a long operation of the rocker switch. When the rocker switch is released, it is possible that a dim stop telegram is sent out via the object.

### 5.2.3 “BLIND”

Parameter window “blind” can be shown in fig. 5.4. With the application, a push button has two functions to be realized: shutter and roller blind. In the case of shutter, an operation of the rocker switch sends out a blind movement command or a slats adjustment command. A short operation always triggers a travel command and a long operation always triggers a slats adjustment command. You can specify whether the shutter control occurs via two 1-bit or two 1-byte communication objects “travel” and “adjust”. If the communication object “adjust” is selected to 1-bit, the slats adjustment command can be sent out cyclically. In the case of roller blind, a short operation triggers a travel command and a long operation trigger a stop command, the blind control occurs via two 1-bit communication objects “travel” and “stop”.

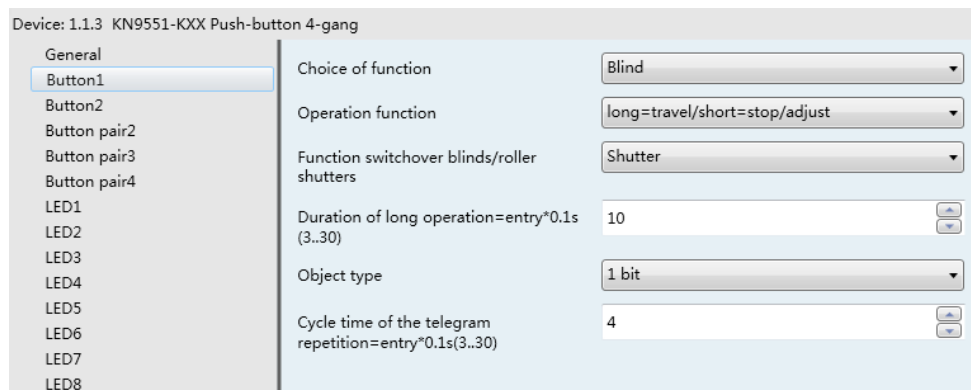


Figure 5.4 “Blind” window

#### “Operation function”

The parameter is used to define the operation mode of long and short option. Options:

long=travel/short=stop/adjust

short=travel/long=stop/adjust

#### “duration of long operation=entry×0.1s(3...30)”

The parameter is used to define the time which a long operation is recognized. Options: 3~30

#### “cycle time of the telegram repetition= entry×0.1s(3...30)”

The parameter is only visible if the “object type” parameter is set to “1 bit”. It is used to set the interval time between two telegrams that are sent cyclically for a durative long operation, options: 3~30

**“object type”**

This parameter is only visible if the “function switchover blinds/roller shutter” parameter is set to “shutter”. It is used to define the type of the communication objects “travel” and “adjust”. Options:

- 1bit
- 1byte

**“Function switchover roller blind/ shutter”**

The parameter is used to determine whether a roller blind or shutter is to be driven by a operation. With the “roller blind” setting, the value for the slats adjustment does not apply.

Options:

- Shutter
- Roller blind

**“value for position down(%)”/“value for position up(%)”**

This parameter can only be set if “1 byte” has been set as object type, which can be used to set the position (percent values) that a connected blind shall be lowered or raised to. Options: 0~100, the value 0% means travel up completely, the value 100% means travel down completely.

**“value for stats position down(%)”/“value for stats position up(%)”**

This parameter can only be set if “1 byte” has been set as object type, which can be used to set the position (percent values) that a connected blind slat shall be opened or closed to. Options: 0~100, the value 0% means slat opened completely, the value 100% means closed completely.

**“travel”, 1bit (shutter)**

This object is visible if the parameter “object type” is set to “1bit”, it is used to send out a shutter movement command (UP or DOWN) on the bus via a short operation of the left or the right side of the rocker switch.

- Telegram value “0” UP
- “1” DOWN

**“adjust”, 1bit (shutter)**

This object is visible if the parameter “object type” is set to “1bit”, it is used to send out a lamella adjustment command (UP or DOWN) on the bus via a long operation of the left or the right side of the rocker switch.

- Telegram value “0” lamella UP
- “1” lamella DOWN

**“travel”, 1byte (shutter)**

This object is visible if the parameter “object type” is set to “1byte”, it is used to send out a shutter movement command (UP or DOWN, percent values) on the bus via a short operation of the left or the right side of the rocker switch.

- Telegram 0~100, 0 travel up completely
- 100 travel down completely.

**“adjust”, 1byte (shutter)**

This object is visible if the parameter “object type” is set to “1byte”, it is used to send out a stats adjustment command (UP or DOWN, percent values) on the bus via a long operation of the left or the right side of the rocker switch.

Telegram 0~100, 0 stat opened completely  
100 stat closed completely.

**“travel”, 1bit (roller blind)**

This object is visible if the parameter “function switchover roller blind/shutter” is set to “roller blind”, it is used to send out a roller blind movement command (UP or DOWN) on the bus via a short operation of the rocker switch.

Telegram value “0” UP  
“1” DOWN

**“stop”, 1bit (roller blind)**

This object is visible if the parameter “function switchover roller blind/shutter” is set to “roller blind”, it is used to send out a roller blind stop telegram on the bus via a long operation of the rocker switch.

Telegram value “0” or “1” stop

**5.2.4 “VALUE SENDER”**

Parameter window “value sender” can be shown in fig. 5.5. With the application, two telegrams with the predefined values from two different communication objects can be sent out for an operation or upon release of the rocker switch.

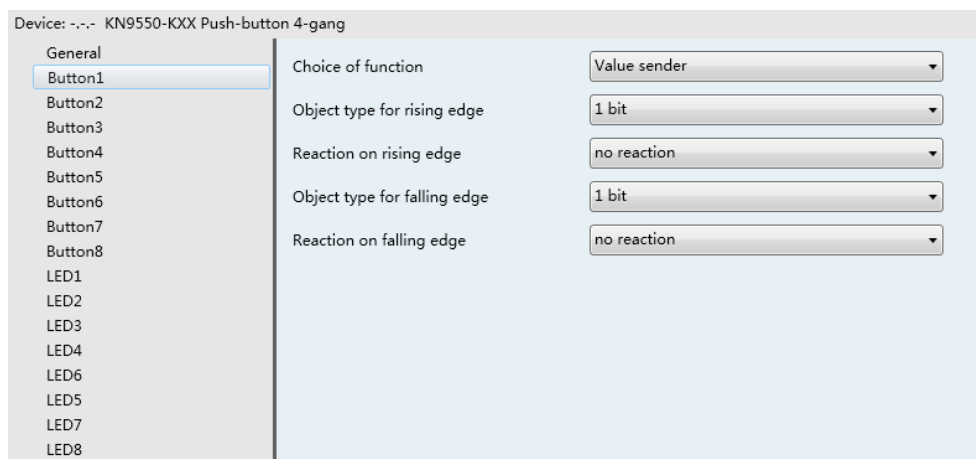


Figure 5.5 “value sender” window

**“object type for rising edge”/“object type for falling edge”**

The parameters are used to define the data types that are sent when the rocker switch is actuated for an operation and the release. The data types specified the bit size of the communication objects and the value range. Options:

- 1bit
- 1byte 0...100%
- 1byte 1...255
- 2byte signed -32768...32767
- 2byte unsigned 0...65535
- 2byte float
- 4byte signed -2147483648...2147483647
- 4byte unsigned 0...4294967295

**“reaction on rising edge”/“reaction on falling edge”**

The parameters are used to determine whether an operation and the release of the rocker switch send out the “value 1” or “value 2”. Options:

- No reaction
- Value 1
- Value 2
- Alternating value 1/value 2

**“value1 for rising edge”/“value2 for rising edge”**

The parameters are used to specify value1 and value2 which are sent out for an operation of the rocker switch. The values range is dependent on the selected data types.

**“value1 for falling edge”/“value2 for falling edge”**

The parameters are used to specify value1 and value2 which are sent out for the release of the rocker switch. The values range is dependent on the selected data type.

**“switching(rising edge)”, 1bit/1byte/2byte/4byte**

The type of the object is set in the parameter “object type for rising edge”, the object is used to send out a telegram with the predefined value for an operation of the rocker switch.

**“switching (falling edge) ”, 1bit/1byte/2byte/4byte**

The type of the object is set in the parameter “object type for falling edge”, the object is used to send out a telegram with the predefined value for the release of the rocker switch.



### 5.2.5 “SCENE”

Parameter window “Scene” can be shown in fig. 5.6. With the application, a predefined light scene number can be called for an operation of the rocker switch. The user has the option to trigger a light scene storage command via a long operation.

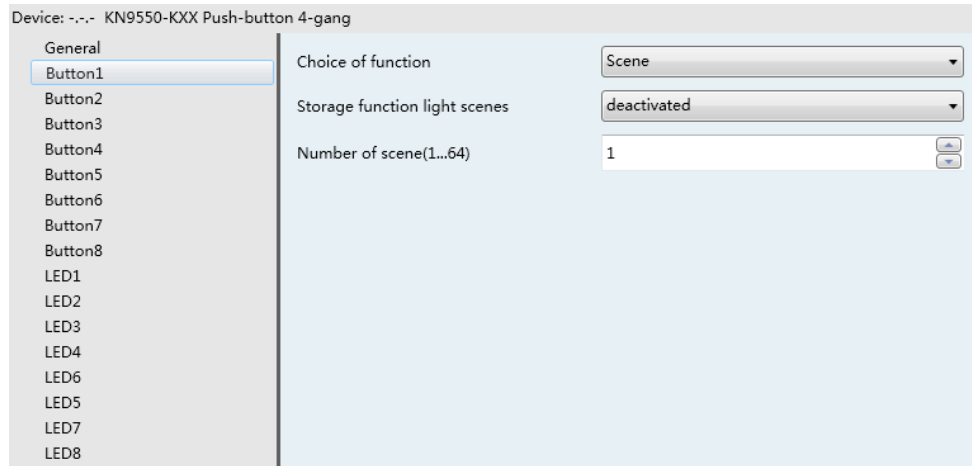


Figure 5.6 “Scene” window

#### “storage function light scenes”

It is used to set whether the light scene storage function is enabled, options:

Deactivated

Activated

With the setting “activated”, the user has the option of sending out a light scene storage command via a long operation. The same 1-byte communication object that is used for this can also call up the light scene number via a short operation.

#### “duration of long operation= entry×0.1s” (3...100) ”

The parameter is only visible if the “storage function light scenes” parameter is set to “activated”. It is used to define the time which a long operation is recognized. Options: 3-100

#### “number of light scene (1...64)”

The parameter is used to set an arbitrary light scene number from 1 to 64 which can be sent out via the 1-byte communication object “light scene number” for operation of the rocker switch.

#### “Number of light scene”, 1byte

The object is used to send out a scene number and the information as to whether a scene should be recalled or the current scene should be stored. The number of light scene is set in the parameter “Number of light scene”.

Telegram code 8 bit: FXNNNNNN

F: 0—Scene is recalled

1—Scene is stored

X: Not used

NNNNNN: Number of the scene (0...63)

1-64 in the parameter setup corresponds to the scene number 0-63 sent by the communication object “Number of light scene”. For example, scene 1 in the parameter setup has the same output result as scene 0 in the communication object “Number of light scene”.

### 5.2.6 “STEP-TYPE SWITCH”

Parameter window “step-type switch” can be shown in fig. 5.7. With the application, the user can trigger different switching processed with each new operation of the rocker switch. Up to four switching levels can be activated.

A short and long operation can be differentiated between for the operation of the rocker switch. For a short operation of the rocker switch, a next level forward is switched to in each case. For a long operation, the first level is activated. Thus a long operation can jump back from every position to the first level without having to run through the remaining levels.

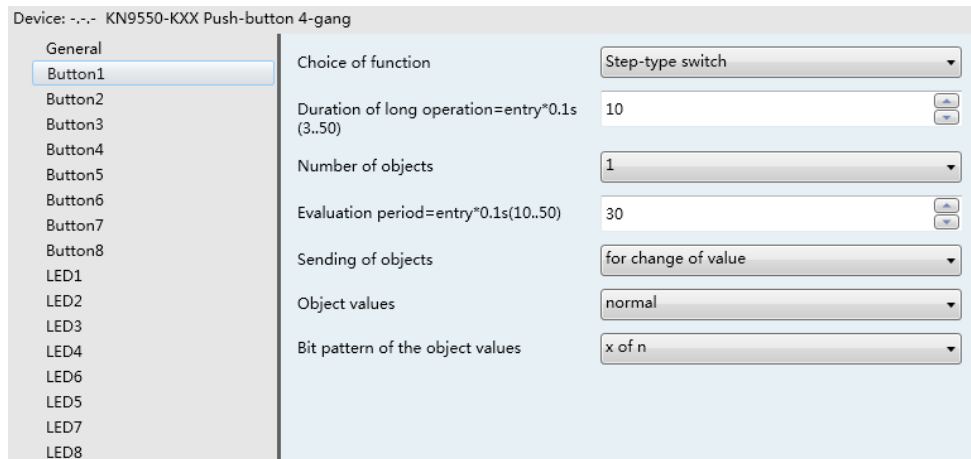


Figure 5.7 “step-type switch” window

#### “Number of objects”

The parameter is used to specify the number of the levels. Up to four levels can be switched. For every level, its own 1-bit communication object is available. Options: 1...4

#### “Evaluation period= entry\*0.1s” (10...50) ”

The parameter is used to set the evaluation period, i.e. the period of time in which complete the first object to the final object sending out via a multiple operation, up to four objects can be sent. Options: 10~50

#### “duration of long operation=entry\*0.1s(3...50)”

The parameter is used to define the time which a long operation is recognized and switched back to the first level. Options: 3~50

**“sending of objects”**

The parameter is used to specify whether the object values for every rocker switch operation are sent out or only if the object values have changed since the last sending out. Options:

For operation

For change of value

The three objects as an example to illustrate the difference between two options (Send normally object values, bit pattern of the object values is x of n) :

Operations	Binary code	objects		
		Stage3	Stage2	Stage1
0	000	Off	Off	Off
1	001	Off	Off	On
2	011	Off	On	On
3	111	On	On	On
4	111	On	On	On
.....	.....	.....	.....	.....

With the setting “for operation”, the three object values are sent out for every operation. Such as the above table from the 1st to the 2nd operation, stage 1 object sends the value of 1, for a while stage 2 object will send the value of 1, finally, stage 3 object will send the value of 0. The total time that the three objects are sent out can be set in the parameter “Evaluation period= entry×0.1s”

With the setting “for change of value”, only the object that values have changed compared with the last values is sent out for every operation. Such as the above table from the 1st to the 2nd operation, only stage 2 object value has changed, so only stage 2 object sends the value of 1.

If the rocker switch is a long operation, the operation is switched back to the initial state.

**“object values”**

The parameter is used to define whether the object values are sent out “invert” or “normal” via their associated 1-bit communication objects, options:

Normal

Inverse

With the setting “normal”, all 1-bit communication objects of the individual levels sent out their values normal.

With the setting “inverse”, all 1-bit communication objects of the individual levels sent out their values inverted.

The three objects as an example to illustrate the difference between two options, their object values are just opposite. As follows:

Operations	Normal				Inverse			
	Binary code	objects			Binary code	objects		
		Stage3	Stage2	Stage1		Stage3	Stage2	Stage1
0	000	Off	Off	Off	111	On	On	On
1	001	Off	Off	On	110	On	On	Off
2	011	Off	On	On	100	On	Off	Off
3	111	On	On	On	000	Off	Off	Off
4	111	On	On	On	000	Off	Off	Off
.....	.....	.....	.....	.....	.....	.....	.....	.....

## “bit pattern of object values”

The parameter is used to determine the way of bit pattern of object values. Options:

x of n

1 of n

The three objects as an example to illustrate their difference, as follows (Send normally object values, n=3):

Operations	X of n				1 of n			
	Binary code	objects			Binary code	objects		
		Stage3	Stage2	Stage1		Stage3	Stage2	Stage1
0	000	Off	Off	Off	000	Off	Off	Off
1	001	Off	Off	On	001	Off	Off	On
2	011	Off	On	On	010	Off	On	Off
3	111	On	On	On	100	On	Off	Off
4	111	On	On	On	100	On	Off	Off
.....	.....	.....	.....	.....	.....	.....	.....	.....

With the setting “x of n”, the binary coding sequence of bit pattern of object values is 000-001-011-111. So the object values have changed step by step.

With the setting “1 of n”, the binary coding sequence of bit pattern of object values is 000-001-010-100. Only one of the object values is 1 for every operation, and the object values have changed with certain regularity.

### “Switching stage1”to “switching stage 4”, 1bit

The number of these objects (max.4) is set in the parameter “Number of objects”. The objects send out the values or some of the values for every new operation of the rocker switch.

## 5.2.7 “SHORT-LONG OPERATION”

Parameter window “short-long operation” can be shown in fig. 5.8. With the application, a telegram with different predefined values can be sent out for a short or long operation of the rocker switch.

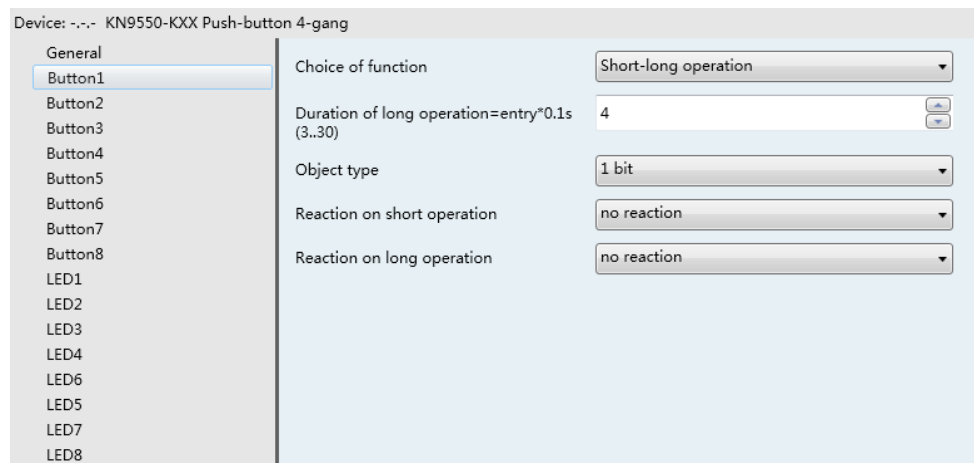


Figure 5.8 “short-long operation” window

### “object type”

The parameter is used to define the data types that are sent when the rocker switch is actuated via a short or long operation. The data types specified the bit size of the communication objects and the value range. Options:

- 1bit
- 1byte 0...100%
- 1byte 1...255
- 2byte signed -32768...32767
- 2byte unsigned 0...65535
- 4byte signed -2147483648...2147483647
- 4byte unsigned 0...4294967295

### “reaction on short operation”

The parameters are used to determine whether the rocker switch sends out the “value1” or “value2” via a short operation. Options:

- No reaction
- Value 1
- Value 2
- Alternating value 1/value 2

**“value 1/2 for short operation”**

The parameters are used to specify value1 and value2 which are sent out for a short operation of the rocker switch. The values range is dependent on the selected data type.

**“reaction on long operation”**

The parameters are used to determine whether the rocker switch sends out the “value1” or “value2” via a long operation. Options:

- No reaction
- Value 1
- Value 2
- Alternating value 1/value 2

**“value 1/2 for long operation”**

The parameters are used to specify value1 and value2 which are sent out for a long operation of the rocker switch. The values range is dependent on the selected data type.

**“duration of long operation= entry\*0.1s(3...30)”**

The parameter is used to define the time which a long operation is recognized. Options: 3~30

**“Value for short operation”, 1bit/1byte/2byte/4byte**

The type of the object is set in the parameter “object type”, the object is used to send out a telegram with the predefined value for a short operation of the rocker switch. The predefined value and data types can be freely selected in the parameters.

**“Value for long operation”, 1bit/1byte/2byte/4byte**

The type of the object is set in the parameter “object type”, the object is used to send out a telegram with the predefined value for a long operation of the rocker switch. The predefined value and data types can be freely selected in the parameters.

## 5.2.8 “RTC OPERATION MODE”

Parameter window “RTC operation mode” can be shown in fig. 5.9. With the application, an operation mode switchover for connected room thermostats can be carried out for an operation of a rocker switch side. The application offers two object types for output, one is three 1-bit communication objects “operating mode comfort”, “operating mode night”, “operating mode frost”, and the other is a 1-byte communication object “operating mode”. In the case of 1-byte, different values mean different operation modes, such as 0=auto, 1=comfort, 2=standby, etc.

The function can be temporarily blocked via this 1-bit “enable” communication object.

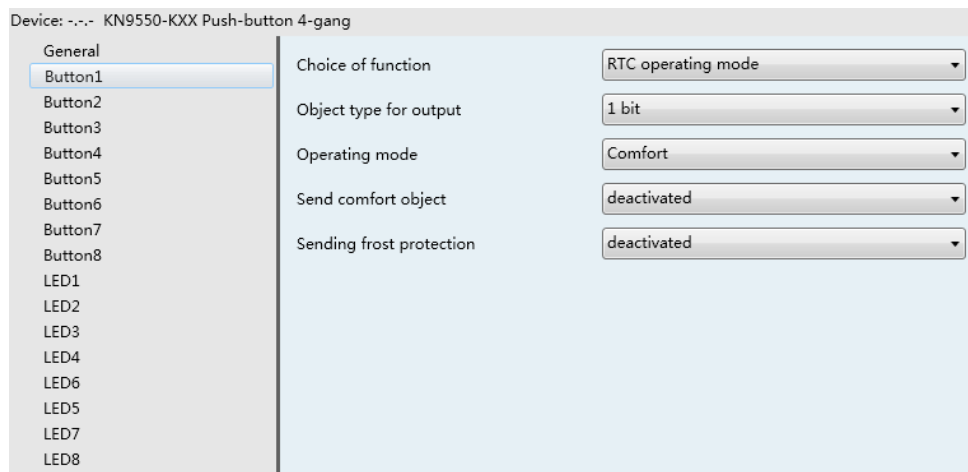


Figure 5.9 “RTC operation mode” window

### “object type for output”

The parameter is used to determine the size of the output communication object for the RTC operation. Options:

- 1bit
- 1byte

The selection “1-bit” is used for control of room thermostats that have 1-bit communication objects for operating mode switchover.

The selection “1-byte” is used for control of room thermostats that have 1-byte communication object for operation mode switchover. In this case, the values mean 0=auto, 1=comfort, 2=standby, 3=night, 4=frost/heat protection, 5~255= not allowed.

### “operating mode”

The parameter is used to specify the operating mode, options:

- Auto
- Comfort
- Standby
- Night
- Frost protection, Heat protection

The “auto” mode can only be set if the “object type for output” parameter is set to “1-byte”, with the selection of “auto”, the value “0” is sent out on the 1byte object. For a connected room thermostat, this means that for every new operation, the individual operating modes “comfort”, “standby”, and “night” will be switched between.

If the “object type for output” parameter is set to “1-bit” and with the selection of “comfort”, the follow “send comfort object” and “sending frost protection” parameters will visible.

If the “object type for output” parameter is set to “1-bit” and with the selection of “standby”, the follow “send comfort object” 、 “sending frost protection” and “sending night object” parameters will visible.

If the “object type for output” parameter is set to “1-bit” and with the selection of “night”, the follow “send comfort object”, “sending frost protection” and “sending night object” parameters will visible.

If the “object type for output” parameter is set to “1byte”, the value “1” is sent out on the 1-byte object and a connected room thermostat switches to the comfort operation mode, the value “2” is sent out on the 1-byte object and a connected room thermostat switches to the standby operation mode, the value “3” is sent out on the 1-byte object and a connected room thermostat switches to the night operation mode, the value “4” is sent out on the 1-byte object and a connected room thermostat switches to the Frost/Heat protection operation mode.

If the “object type for output” parameter is set to “1bit”, when the object “comfort operating mode” sends a telegram “1” on operating switch, and other objects send telegrams “0”, right now a connected room thermostat switches to the comfort operation mode; when the object “night operating mode” sends a telegram “1” on operating switch, and other objects send telegrams “0”, right now a connected room thermostat switches to the night operation mode; when all objects send telegrams “0” on operating switch, right now a connected room thermostat switches to the standby operation mode. When the operation mode is set to the Frost/Heat protection operation mode, other operation modes of communication objects and parameters will be not visible.

### **“send comfort object”**

This parameter will be visible when the parameter “object type for output” is set to “1bit”, here set whether the comfort mode is activated. Options:

- Deactivated
- Activated

When selecting “activated” option, the communication object “comfort operating mode” is enabled.

### **“sending frost protection”**

This parameter will be visible when the parameter “object type for output” is set to “1bit”, here set whether the frost/heat protection mode is activated. Options:

- Deactivated
- Activated

When selecting “activated” option, the communication object “frost operating mode” is enabled.

### **“send night object”**

This parameter will be visible when the parameter “object type for output” is set to “1bit”, here set whether the night mode is activated. Options:

- Deactivated
- Activated

When selecting “activated” option, the communication object “night operating mode” is enabled.



**“Comfort operating mode”, 1bit**

This communication is visible if the parameter “send comfort object” is set to “activated”. If the object receives an ON telegram, a connected room thermostat switches to the comfort operation mode.

**“Frost operating mode”, 1bit**

This communication is visible if the parameter “send frost protection” is set to “activated”. If the object receives an ON telegram, a connected room thermostat switches to the frost/heat protection operation mode.

**“Night operating mode”, 1bit**

This communication is visible if the parameter “send night object” is set to “activated”. If the object receives an ON telegram, a connected room thermostat switches to the night operation mode.

**“Operation mode”, 1byte**

This communication is visible if the parameter “object type for output” is set to “1byte”. The object sends out different telegram values, different values mean different operation modes, such as 0=auto, 1=comfort, 2=standby, 3= night, 4=or Frost protection, Heat protection, values 5~255 is not allowed.

### 5.2.9 MULTIPLE OPERATION

“Multiple operation” function allows use define some (up to 5) different objects , delay time delay to send, data type.

Device: --- KN9550-KXX Push-button 4-gang

General	Choice of function	Multiple operation
Button1	Object type for object1	1 bit
Button2	Function for object type 1bit for object1	Transmit value
Button3	Value for object1(1bit)	off
Button4	Time delay for object1 in second	0
Button5	Object type for object2	1 bit
Button6	Function for object type 1bit for object2	Transmit value
Button7	Value for object2(1bit)	off
Button8	Time delay for object2 in second	0
LED1	Object type for object3	1 bit
LED2	Function for object type 1bit for object3	Transmit value
LED3	Value for object3(1bit)	off
LED4	Time delay for object3 in second	0
LED6	Object type for object4	1 bit
LED5	Function for object type 1bit for object4	Transmit value
LED7	Value for object4(1bit)	off
LED8	Time delay for object4 in second	0
	Object type for object5	1 bit
	Function for object type 1bit for object5	Transmit value
	Value for object5(1bit)	off
	Time delay for object5 in second	0

Figure 5.8 “short long operation” window

#### “Object X type”

This parameter define the data type of object. Options:

- 1bit
- 1byte 0..100%
- 1byte 1..255
- 2byte signed
- 2byte unsigned
- 2byte float
- 4byte signed
- 4byte unsigned

#### “Sending value of object X”

This parameter define the value to be sent.

#### “Time delay to send for object1 (0..255s)”

This parameter define time delay to send. Options:

- 0..255

## 5.3 LINKED WORKING MODE

In the linked working mode, the applications differentiate between whether the rocker switch is operated on the left and right side.

### 5.3.1 “SWITCHING”

Parameter window “switching” can be shown in fig. 5.3. With the “switching” application, an operation of the right or left side of the rocker switch sends out a switching telegram.

Device: -.-- KN9550-KXX Push-button 4-gang

General	Choice of function	Short-long operation
Button1	Duration of long operation=entry*0.1s (3..30)	4
Button2	Object type	1 bit
Button3	Reaction on short operation	no reaction
Button4	Reaction on long operation	no reaction
Button5		
Button6		
Button7		
Button8		
LED1		
LED2		
LED3		
LED4		
LED6		
LED5		
LED7		
LED8		

Figure 5.10 “Switching” window

#### “switching, rocker switch total”

The parameter is used to define whether switching on or switching off occurs via the right or the left side of the rocker switch. Options:

- Left on, right off
- Left off, right on
- Alternating on/off

If the option alternating on/off is selected, switching is always between ON and OFF. That means, for example, if an ON telegram was last sent out, then a renewed operation of the rocker switch will trigger an OFF telegram. When the rocker switch is operated again, an ON telegram is sent out, etc. The rocker switch thus always remembers the last state and then switches over to the other value.

#### “switching”, 1bit

According to the parameter setting, the object is used to send out an ON telegram or an OFF telegram via an operation of the left or the right side of the rocker switch.

### 5.3.2 “DIMMING”

Parameter window “Dimming” can be shown in fig. 5.11. With the “dimming” application, an operation of the right or left side of the rocker switch sends out a switching telegram or a dimming telegram. In the case of step-wise dimming, a distinction is made between short and long operation, you can specify whether a short or long operation will execute switching or dimming. A “switching” switching telegram is sent out on the 1-bit communication object. A “relative dimming” dimming telegram is sent out on the 4-bit communication object.

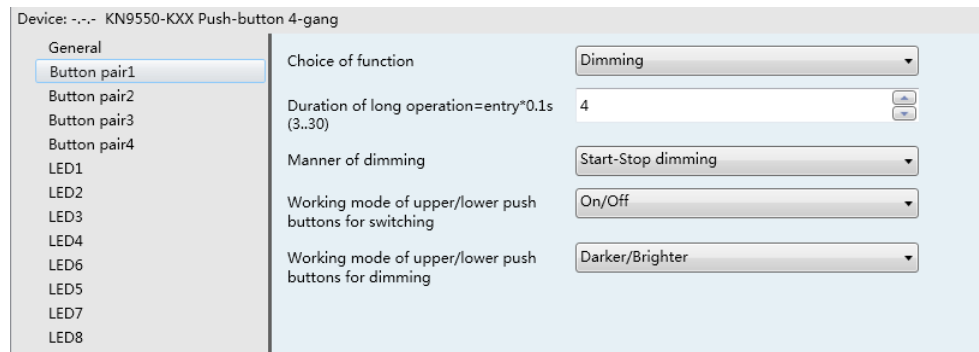


Figure 5.11 “Dimming” window

#### “duration of long operation=entry×0.1s” (3...30)

The parameter is used to define the time which a long operation is recognized. Options:3-30

#### “manner of dimming”

You can select between the two dimming manner “start-stop dimming” and “step-wise dimming” via this parameter. Options:

- Start-stop dimming
- Step-wise dimming

With the “step-wise dimming” option, the dimming manner is the step-wise dimming. You can set a telegram with the “brighter” or “darker” information whether is sent out cyclically by a long operation. And when the rocker switch is released, you can also set the telegram with the “dimming stop” information whether is sent out.

#### “step size for dimming”

The parameter is only visible if the “manner of dimming” parameter is set to “step-wise dimming”. Here you can specify by how much brighter or darker dimming should occur. The sent out value always relates to the current brightness value. For example, a dimming actuator is currently dimmed to a brightness value of 70%. By operation of the rocker switch, a dimming command “dim by 25% (1/4) brighter” is sent out. The dimming actuator will adjust its brightness value to 95% immediately after receiving the dimming command. Options:

- 1/1 , 1/2, 1/4, ..., 1/32, 1/64

**“dimming functionality”**

The parameter is only visible if the “manner of dimming” parameter is set to “step-wise dimming”. It is used to define the functionality of the dimming. You can set whether a switching telegram will be sent out for a short operation of the rocker switch and a dimming telegram will be sent out for a long operation or whether a long operation will cause a switching telegram to be sent out and a short operation will cause a dimming telegram to be sent out. Options:

- Short operation dimming, long operation switching
- Short operation switching, long operation dimming

**“working mode of the push button for switching”**

The parameter is used to determine whether operation of the left or right side of the rocker switch will send out an ON or an OFF telegram or a toggle telegram. Options:

- Left on, right off
- Left off, right on
- Alternating on/off

If the option alternating on/off is selected, you can switch between switching on and switching off for every operation that triggers a switching telegram. For example, if an ON telegram was last sent out, then a renewed operation of the rocker switch will trigger an OFF telegram. When the rocker switch is operated again, an ON telegram is sent out, etc. The rocker switch thus always remembers the last state and then switches over to the other value.

**“working mode of the push button for dimming”**

The parameter is used to determine whether operation of the left or right side of the rocker switch will send out a dim brighter or a dim darker telegram. A dimming telegram that is triggered by operation of the rocker switch will be sent out on the 4-bit communication object “relative dimming”. Options:

- Left darker, right bright
- Left bright, right darker

**“dimming stop telegram”**

The parameter is only visible if the “dimming functionality” parameter is set to “short operation switching, long operation dimming”. It is used to determine whether the release of the rocker switch will trigger the “dimming stop” command or not. Options:

- Dimming stop is send
- Dimming stop is not send

With the “dimming stop is send” option, when the rocker switch is released, the telegram with the “dimming stop” information is sent out on the 4-bit communication object “relative dimming”.

**“cyclical sending of dimming telegrams”**

The parameter is only visible if the “dimming functionality” parameter is set to “short operation switching, long operation dimming”. It is used to determine the telegram with the “brighter” or “darker” information whether is sent out cyclically by a durative long operation. Options:

- Deactivated
- Activated

With the “activated” option, when triggered a durative long operation, the telegram with the “brighter” or “darker” information is sent out cyclically on the 4-bit communication object “relative dimming”.

### “Duration of the telegram repetitions=entry×0.1 s (3...30) ”

The parameter is only visible if the “cyclical sending of dimming telegrams” parameter is set to “activated”. It is used to set the interval time between two telegrams that are sent cyclically, options: 3~30

### “switching”, 1bit

According to the parameter setting, the object is used to send out an ON telegram or an OFF telegram via an operation of the left or the right side of the rocker switch.

### “relative dimming”, 4bit

According to the parameter setting, the object is used to send out a dim brighter or a dim darker telegram, or a dim stop telegram via an operation of the left or the right side of the rocker switch.

## 5.3.3 “BLIND”

Parameter window “blind” can be shown in fig. 5.12. With the “blind” application, an operation of the right or left side of the rocker switch sends out a blind movement command or a slats adjustment command. A short operation always triggers a travel command and a long operation always triggers a slats adjustment command. You can specify whether the blind control occurs via two 1-bit or two 1-byte communication objects “travel” and “adjust”.

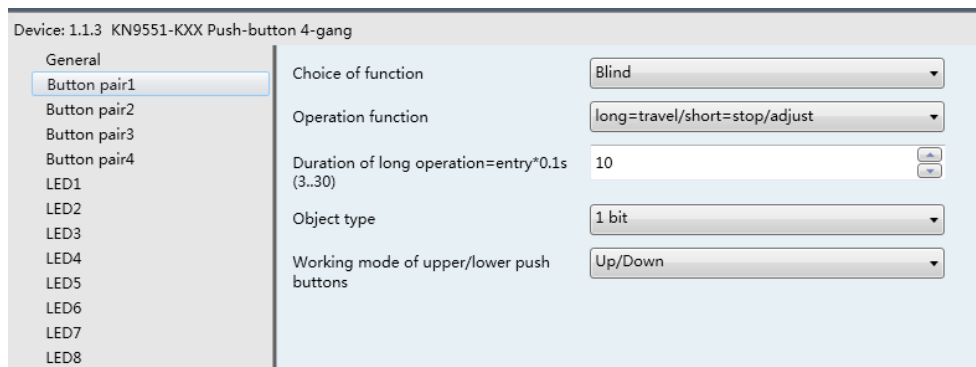


Figure 5.12 “Blind” window

### “Operation function”

The parameter is used to define the operation mode of long and short option. Options:  
 long=travel/short=stop/adjust  
 short=travel/long=stop/adjust

### “duration of long operation=entry×0.1s(3...30)”

The parameter is used to define the time which a long operation is recognized. Options: 3~30

### “object type”

This parameter is used to define the type of the communication objects “travel” and “adjust”. Options:

- 1bit
- 1byte

**“working mode of the push button”**

The parameter is used to determine whether operation of the left or right side of the rocker switch will send out commands for movement and adjustment. For a short operation of the rocker switch, a moving up or down telegram is sent out on a 1-bit communication object. For a long operation of the rocker switch, a slat adjustment up or down telegram is sent out on a 1-bit communication object. Options:

Left down, right up

Left up, right down

**“value for position down(%)”/“value for position up(%)”**

This parameter can only be set if “1 byte” has been set as object type, which can be used to set the position (percent values) that a connected blind shall be lowered or raised to. Options: 0~100, the value 0% means travel up completely, the value 100% means travel down completely.

**“value for stats position down(%)”/“value for stats position up(%)”**

This parameter can only be set if “1 byte” has been set as object type, which can be used to set the position (percent values) that a connected blind slat shall be opened or closed to. Options: 0~100, the value 0% means slat opened completely, the value 100% means closed completely.

**“travel”, 1bit**

This object is visible if the parameter “object type” is set to “1bit”, it is used to send out a shutter movement command (UP or DOWN) on the bus via a short operation of the left or the right side of the rocker switch.

Telegram value “0” UP

“1” DOWN

**“adjust”, 1bit**

This object is visible if the parameter “object type” is set to “1bit”, it is used to send out a lamella adjustment command (UP or DOWN) on the bus via a long operation of the left or the right side of the rocker switch.

Telegram value “0” lamella UP

“1” lamella DOWN

**“position”, 1byte**

This object is visible if the parameter “object type” is set to “1byte”, it is used to send out a shutter movement command (UP or DOWN, percent values) on the bus via a short operation of the left or the right side of the rocker switch.

Telegram 0~100, 0 travel up completely

100 travel down completely.

**“Stats position”, 1byte**

This object is visible if the parameter “object type” is set to “1byte”, it is used to send out a stats adjustment command (UP or DOWN, percent values) on the bus via a long operation of the left or the right side of the rocker switch.

Telegram 0~100, 0 stat opened completely

100 stat closed completely.

### 5.3.4 “VALUE SENDER”

Parameter window “value sender” can be shown in fig. 5.13. With the application, a telegram with the predefined value is sent out for an operation of the right or the left side of the rocker switch.

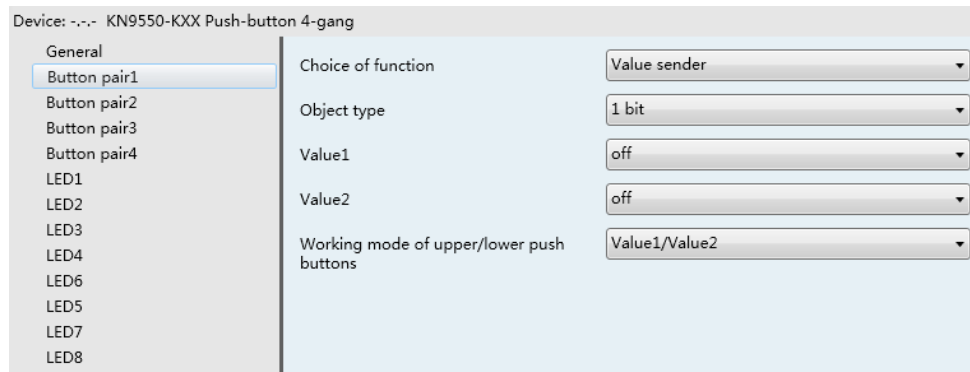


Figure 5.13 “value sender” window

#### “object type”

The parameter is used to define the data type that is sent when the rocker switch is actuated for every operation. The data type specified the bit size of the communication objects and the value range. Options:

- 1bit
- 1byte 0...100%
- 1byte 1...255
- 2byte signed -32768...32767
- 2byte unsigned 0...65535
- 4byte signed -2147483648...2147483647
- 4byte unsigned 0...4294967295

#### “working mode of the push button”

This parameter is used to determine whether the right or the left side of the rocker switch sends out the “value 1” or “value 2”. Options:

- Left value 1, right value 2
- Left value 2, right value 1
- Alternating value 1/value 2

If the option alternating value1/value2 is selected, switching is always between value1 and value2. That means, for example, if value1 was last sent out, then a renewed operation of the rocker switch will trigger value2. When the rocker switch is operated again, value1 is sent out, etc. The rocker switch thus always remembers the last state and then switches over to the other value.

#### “value1”/“value2”

The parameters are used to specify value1 and value2 which are sent out for an operation of the right or left side of the rocker switch. The values range is dependent on the selected data type.

#### “value switching”, 1bit/1byte/2byte/4byte

The type of the object is set in the parameter “object type”, the object is used to send out a telegram with the predefined value for an operation of the right or the left side of the rocker switch. The predefined value and data types can be freely selected in the parameters.



### 5.3.5 “VALUE DIMMING SENSOR”

Parameter window “value dimming sensor” can be shown in fig. 5.14. With the application, each operation of the right or left side of the rocker switch will increase or reduce a 1-byte value (percent or value from 0 to 127) via sending a 1-byte telegram. The 1-byte value can be connected with 1-byte brightness value objects from dimming actuators. Thus a dimming actuator can be dimmed brighter or darker.

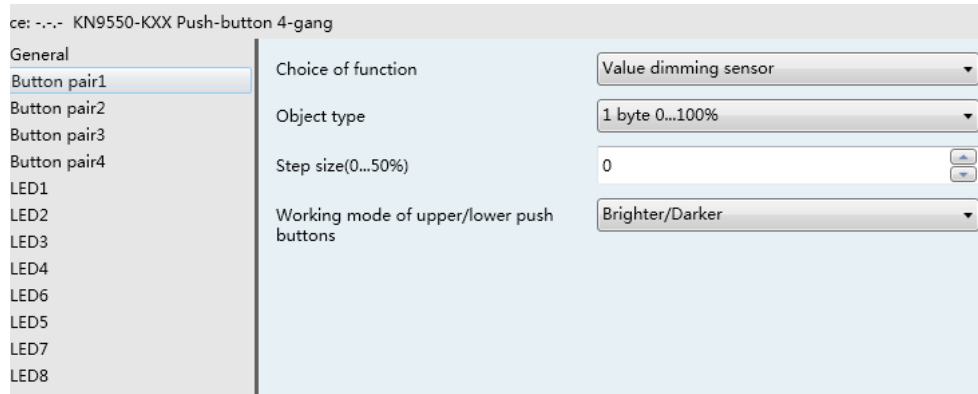


Figure 5.14 “value dimming sensor” window

#### “object type”

With the setting “1-byte 0...100%”, the momentary value is increased or reduced by a percent amount for every operation. With the setting “1-byte 0...255”, the momentary value is increased or reduced by an absolute value for every operation.

#### “Step size”

The parameter is used to determine how large the percent value or the absolute value will be increased or reduced for every operation. For example, the current value is 40%, for a step size of 10%, the current value is increased from 40% to 50% for an operation (for an increase).

#### “working mode of the push button as value dimming”

The parameter is used to determine whether the operation of the left or right side of the rocker switch increased or lowers the value that is sent out from the 1-byte communication object “value”. Options:

- Left bright, right darker
- Left darker, right bright

#### “value”, 1byte

The type of the object value is set in the parameter “object type”, the object is used to send out a telegram with the predefined value for an operation of the right or the left side of the rocker switch. The predefined value is set in the parameter “step size”.

- Telegram value 0~50%
- Or 0~127

### 5.3.6 “STEP-TYPE SWITCH”

Parameter window “step-type switch” can be shown in fig. 5.15. With the application, the user can trigger different switching processed with each new operation of the left or right side of the rocker switch. Up to four switching levels can be activated. Depending on the setting, a stage higher or a stage lower can thus be switched to.

Device: --- KN9550-KXX Push-button 4-gang	
General	
Button pair1	Choice of function: Step-type switch
Button pair2	Number of objects: 1
Button pair3	Evaluation period=entry*0.1s(10..50): 30
Button pair4	Working mode of upper/lower push buttons: Up/Down
LED1	Sending of objects: for change of value
LED2	Object values: normal
LED3	Bit pattern of the object values: x of n
LED4	
LED6	
LED5	
LED7	
LED8	

Figure 5.15 “step-type switch” window

#### “Number of objects”

The parameter is used to specify the number of the levels. Up to four levels can be switched. For every level, its own 1-bit communication object is available. Options:1...4

#### “Evaluation period= entry×0.1s” (10...50) ”

The parameter is used to set the evaluation period, i.e. the period of time in which complete the first object to the final object sending out via a multiple operation, up to four objects can be sent. Options: 10~50

#### “working mode of the push button”

The parameter is used to specify whether an operation of the left or right side of the rocker switch switches one stage up or lower. Options:

- Left up, right down
- Left down, right up

The three objects as an example to illustrate the working mode, as follows: (Send normally object values, bit pattern of the object values is x of n)

operations	Binary code	objects		
		Stage 3	Stage2	Stage 1
0	000	Off	Off	Off
1	001	Off	Off	On
2 (current)	011	Off	On	On
3	111	On	On	On
4	111	On	On	On
.....	.....	.....	.....	.....

With the setting “left up, right down”, the current operation is 2. If an operation of the left rocker switch side switches one stage up, the next operation will be 3. If an operation of the right rocker switch side switches one stage lower, the next operation will be 1.

With the setting “left down, right up”, the current operation is 2. If an operation of the left rocker switch side switches one stage lower, the next operation will be 1. If an operation of the right rocker switch side switches one stage up, the next operation will be 3.

## “sending of objects”

The parameter is used to specify whether the object values for every rocker switch operation are sent out or only if the object values have changed since the last sending out. Options:

For operation

For change of value

Above form as an example to illustrate the difference between two options:

With the setting “for operation”, the three object values are sent out for every operation. Such as the above table from the 1st to the 2nd operation, stage 1 object sends the value of 1, for a while stage 2 object will send the value of 1, finally, stage 3 object will send the value of 0. The total time that the three objects are sent out can be set in the parameter “Evaluation period= entry×0.1s”

With the setting “for change of value”, only the object that values have changed compared with the last values is sent out for every operation. Such as the above table from the 1st to the 2nd operation, only stage 2 object value has changed, so only stage 2 object sends the value of 1.

## “object values”

The parameter is used to define whether the object values are sent out “invert” or “normal” via their associated 1-bit communication objects, options:

Normal

Inverse

With the setting “normal”, all 1-bit communication objects of the individual levels sent out their values normal.

With the setting “inverse”, all 1-bit communication objects of the individual levels sent out their values inverted.

The three objects as an example to illustrate the difference between two options, their object values is just opposite. As follows:

Operations	Normal				Inverse			
	Binary code	objects			Binary code	objects		
		Stage3	Stage2	Stage1		Stage3	Stage2	Stage1
0	000	Off	Off	Off	111	On	On	On
1	001	Off	Off	On	110	On	On	Off
2	011	Off	On	On	100	On	Off	Off
3	111	On	On	On	000	Off	Off	Off
4	111	On	On	On	000	Off	Off	Off
.....	.....	.....	.....	.....	.....	.....	.....	.....

### “bit pattern of object values”

The parameter is used to determine the way of the bit pattern of object values. Options:

x of n

1 of n

The three objects as an example to illustrate their difference, as follows (Send normally object values, n=3):

Operations	X of n				1 of n			
	Binary code	objects			Binary code	objects		
		Stage3	Stage2	Stage1		Stage3	Stage2	Stage1
0	000	Off	Off	Off	000	Off	Off	Off
1	001	Off	Off	On	001	Off	Off	On
2	011	Off	On	On	010	Off	On	Off
3	111	On	On	On	100	On	Off	Off
4	111	On	On	On	100	On	Off	Off
.....	.....	.....	.....	.....	.....	.....	.....	.....

With the setting “x of n”, the binary coding sequence of bit pattern of object values is 000-001-011-111. So the object values have changed step by step.

With the setting “1 of n”, the binary coding sequence of bit pattern of object values is 000-001-010-100. Only one of the object values is 1 for every operation, and the object values have changed with certain regularity.

### “Switching stage1”to “switching stage 4”, 1bit

The number of these objects (max.4) is set in the parameter “Number of objects”. The objects send out the values or one of the values for every new operation of the left or the right side of the rocker switch.

## 5.4 “LED FUNCTION”

Parameter window “LED function” can be shown in fig. 5.16. Each rocker switch has a LED, which can be used for status display or for the function display. The LED can light up in different colors. The LED can also flash for alarm display. LED indication and the button operation are independent of each other. Their parameters and communication objects available can be set separately.

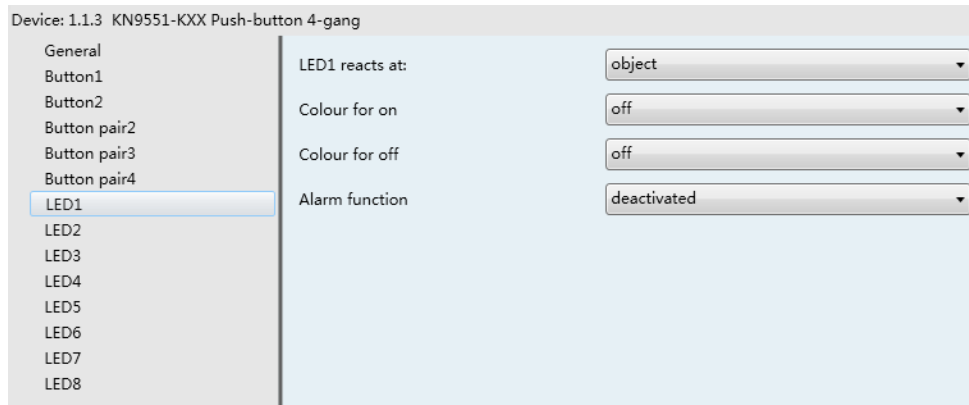


Figure 5.16 “LED function” window

### “LED function enable”

It is used to set whether LED function is enabled, options:

- None
- Object
- Button Activation

If the option “object” is selected, the object “Status” will be enabled, LED is controlled by the object. If the option “button activation”, then LED is controlled is by button option.

### “color for off”、 “color for on”

This parameter define the color when “Status” object receive ‘0’ and ‘1’. Options:

- Off
- Red
- Green

This parameter define the color when “Status” object receive ‘0’ and ‘1’.

### “color for pressing”、 “color for releasing”

This parameter define the color when press and release the button. Options: Off

- Red
- Green

### “alarm function”

This parameter is used to define whether the alarm function is enabled for the LED. Options:

- Deactivated
- Active

If the option active is selected, the alarm function will be switched active, and the object “alarm” will be enabled. The LED will flash if the object receives an ON telegram. If the object receives an OFF telegram, the LED will no longer flash.

**Note:** In the case of LED no indication, the LED flashes red when the alarm is enabled. If the LED takes on one color, it will flashes in the same color. If the LED status is turned into “off”, the flashing color will change back to red again.

**“Status”, 1bit/1byte**

If the “LED function enable” parameter is set to “active”, the object “status” is enabled. The object status can either be set to the size “1 bit” or “1 byte”. 1-byte value range: 0~255.

**“alarm”, 1bit**

If the “alarm function” parameter is set to “active”, the object “alarm” will be enabled. The LED will flash if the object receives an ON telegram. If the object receives an OFF telegram, the LED will no longer flash.

## 6. COMMUNICATION OBJECT DESCRIPTION

Communication object is the media of devices on the bus to communicate with other devices, that is, just communication object can communicate with the BUS. All buttons of the push button have the same communication objects. The following description is the detailed introduction of the role of each communication object with Button 1 as an example.

Note: “C” in “Flag” column in the below table means that the object has a normal link to the bus; “W” means the object value can be modified via the bus; “R” means the value of the object can be read via the bus; “T” means that a telegram is transmitted when the object value has been modified; “U” means that value response telegrams are interpreted as a write command, the value of the object is updated.

### 6.1 INDEPENDENT WORKING MODE COMMUNICATION OBJECTS

#### 6.1.1 “DISABLE FUNCTION” COMMUNICATION OBJECT

Number...	Name	Object Function	Description	Group Address...	Length	...	R	W	T	U	Data Type	Priori...
0	Button1, function disable	Button function disable			1 bit	C	-	W	-	-	switch	Low

Figure 6.1.1 “Disable function” Communication Object

Number	Function	Object name	Data	Flags
0,6,12,18,24,30,36,42	Disable function	Button1, disable	1bit	C, W
This object is used to disable the function of a button, when receives value “1”, function of the button is disabled, when receives value “0”, function of the button is enabled. The function of the button is enabled when powered on by default.				

Table 1 “Disable function” Communication Object Table

#### 6.1.2 “SWITCHING” COMMUNICATION OBJECT

1	Button1,switching	Switching			1 bit	C	-	W	T	-	switch	Low
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Figure 6.1.2 “Switching” Communication Object

Number	Function	Object name	Data	Flags
1,7,13,19,25,31,37,43	switching	Button X, switching	1bit	C, W, T
When the button is operated, the object will send telegram “1” to trigger switch ON, and telegram “0” to trigger switch OFF.				

Table 2 “Switching” Communication Object Table

### 6.1.3 “DIMMING” COMMUNICATION OBJECT

1	Button1_dimming	Switching	1 bit	C	-	W	T	-	switch	Low
2	Button1_dimming	Relative dimming	4 bit	C	-	-	T	-	dimming control	Low

Figure 6.1.3 “Switching” Communication Object

Number	Function	Object name	Data	Flags
1,7,13,19,25,31,37,43	switching	Button X, dimming	1bit	C, W, T
This object is used for short operation switching.				
2,8,14,20,26,32,38,44	Relative dimming	Button X, dimming	4bit	C, T
This object is used for long operation relative dimming.				

Table 3 “Dimming” Communication Object Table

### 6.1.4 “BLIND” COMMUNICATION OBJECT

1	Button1_blind	Travel	1 bit	C	-	-	T	-	up/down	Low
2	Button1_blind	Adjust	1 bit	C	-	-	T	-	counter pulses (signe Low	

Figure 6.1.4 “Blind” Communication Object

Number	Function	Object name	Data	Flags
1,7,13,19,25,31,37,43	Move	Button X, blind	1bit	C, T
This object is used to control the movement of the blind, when telegram “1” is sent, the blind will move down; when telegram “0” is sent, the blind will move up.				
2,8,14,20,26,32,38,44	Adjust	Button X, blind	1bit	C, T
This object is used to stop the movement/control slats adjustment of the blind, when telegram “1” is sent, the slats will adjust down; when telegram “0” is sent, the slats will adjust up.				

Table 4 “Blind” Communication Object Table

### 6.1.5 “VALUE SENDER” COMMUNICATION OBJECT

1	Button1_value sender	Switching(rising edge)	1 bit	C	-	-	T	-	switch	Low
2	Button1_value sender	Switching(falling edge)	1 bit	C	-	-	T	-	switch	Low

Figure 6.1.5 “value sender rocker switch total” Communication Object

Number	Function	Object name	Data	Flags
1,7,13,19,25,31,37,43	Pressing	Button X, value sender	1bit/1byte/2byte/4byte	C, T
This object is used to send the value when pressing the button. The value range is determined by data type, different data types have different value ranges. Data type is determined by parameter “object type”.				
2,8,14,20,26,32,38,44	Release	Button X, value sender	1bit/1byte/2byte/4byte	C, T
This object is used to send the value when releasing the button. The value range is determined by data type, different data types have different value ranges. Data type is determined by parameter “object type”.				

Table 5 “Value sender” Communication Object Table

## 6.1.6 “SCENE” COMMUNICATION OBJECT

1	Button1.scene	Number of scene	1 Byte	C	-	-	T	-	scene number	Low
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Figure 6.1.6 “Scene” Communication Object

Number	Function	Object name	Data	Flags
1,7,13,19,25,31,37,43	Scene number	Button1, scene	1byte	C, T
<p>This object is used to control a scene. Sending a 8bit command via this object can recall or save a scene. Detailed description of the 8bit command is as follows.</p> <p>An 8bit command is (binary encoding): FXNNNNNN</p> <p>F: “0” is to recall a scene, “1” is to save a scene</p> <p>X: not used</p> <p>NNNNNN: scene number (0...63)</p> <p>Parameter setting scene number is 1~64, actually the corresponding scene telegrams sent by object “Number of light scenes” is 0~63. For example: the scene number in parameter setting is 1, then the scene telegram sent by object “Number of light scenes” is 0.</p>				

Table 6 “Scene” Communication Object Table

## 6.1.7 “STEP-TYPE SWITCH” COMMUNICATION OBJECT

1	Button1.step-type switch	Switching stage 1	1 bit	C	-	-	T	-	switch	Low
2	Button1.step-type switch	Switching stage 2	1 bit	C	-	-	T	-	switch	Low
3	Button1.step-type switch	Switching stage 3	1 bit	C	-	-	T	-	switch	Low
4	Button1.step-type switch	Switching stage 4	1 bit	C	-	-	T	-	switch	Low
5	Button1.step-type switch	Switching stage 5	1 bit	C	-	-	T	-	switch	Low

Figure 6.1.7 “Step-type Switch” Communication Object

Number	Function	Object name	Data	Flags
1~5, 7~11, 13~17, 19~23, 25~29, 31~35, 37~41, 43~45	Switching stage 1~5	Button X, step-type	1bit	C, T
These 5 objects can send maximum 5 data once to the Bus.				

## 6.1.8 “SHORT-LONG OPERATION” COMMUNICATION OBJECT

1	Button1.short-long operation	Value for short operation	1 bit	C	-	-	T	-	switch	Low
2	Button1.short-long operation	Value for long operation	1 bit	C	-	-	T	-	switch	Low

Figure 6.1.8 “short-long operation rocker switch left/right” Communication Object

Number	Function	Object name	Data	Flags
1,7,13,19,25,31,37,43	Value for short operation	Button X, Button1, short-long operation	1bit/1byte/2byte/4 byte	C, T
<p>This object is used to send object value of short operation. The value range is determined by data type, different data types have different value ranges. Data type is determined by parameter “object type”.</p>				
2,8,14,20,26,32,38,44	Value for long operation	Button X, Button1, short-long operation	1bit/1byte/2byte/4 byte	C, T
<p>This object is used to send object value of long operation. The value range is determined by data type, different data types have different value ranges. Data type is determined by parameter “object type”.</p>				

Table 8 “Short-long operation” Communication Object



## 6.1.9 “RTC” COMMUNICATION OBJECT

2	Button1,RTC	Comfort operating mode	1 bit	C	-	-	T	-	switch	Low
3	Button1,RTC	Frost operating mode	1 bit	C	-	-	T	-	switch	Low
4	Button1,RTC	Night operating mode	1 bit	C	-	-	T	-	switch	Low
2	Button1,RTC	Operating mode	1 Byte	C	-	-	T	-		

Figure 6.1.9 “RTC” Communication Object

Number	Function	Object name	Data	Flags
1,7,13,19,25,31,37,43	Comfort operating mode	Button X, RTC	1bit	C, T
This object is enabled when 1bit is selected under RTC mode to send command of “Comfort operating mode” to the Bus. “1” is to enable “Comfort operating mode”, “0” is to disable “Comfort operating mode”.				
2,8,14,20,26,32,38,44	Frost operating mode	Button X, RTC	1bit	C, T
This object is enabled when 1bit is selected under RTC mode to send command of “Frost operating mode” to the Bus. “1” is to enable “Frost operating mode”, “0” is to disable “Frost operating mode”.				
3,9,15,21,27,33,39,45	Night operating mode	Button X, RTC	1bit	C, T
This object is enabled when 1bit is selected under RTC mode to send command of “Night operating mode” to the Bus. “1” is to enable “Night operating mode”, “0” is to disable “Night operating mode”.				
1,7,13,19,25,31,37,43	Operating mode	Button X, RTC	1byte	C, T
This object is enabled when 1bit is selected under RTC mode to send command of “Comfort operating mode” to the Bus. ‘0’ is auto mode ‘1’ is comfort mode ‘2’ is standby mode ‘3’ is night mode ‘4’ is frost/heat protection mode				

Table 9 “RTC” Communication Object

## 6.1.10 “MULTIPLE OPERATION” COMMUNICATION OBJECT

1	Button1,multiple operation	Switching 1 actuation	1 bit	C	-	-	T	-	switch	Low
2	Button1,multiple operation	Switching 2 actuation	1 bit	C	-	-	T	-	switch	Low
3	Button1,multiple operation	Switching 3 actuation	1 bit	C	-	-	T	-	switch	Low
4	Button1,multiple operation	Switching 4 actuation	1 bit	C	-	-	T	-	switch	Low
5	Button1,multiple operation	Switching 5 actuation	1 bit	C	-	-	T	-	switch	Low

Figure 6.1.10 “Multiple operation” Communication Object

Number	Function	Object name	Data	Flags
1~5, 7~11, 13~17, 19~23, 25~29, 31~35,37~41,43~45	Switching x actuation	Button X, Multiple operation	1bit/1byte/2byte/4byte	C, T
These 5 objects can send maximum 5 data once to the Bus. The value range is determined by data type, different data types have different value ranges. Data type is determined by parameter “object type”.				

Table 10 “Multiple operation” Communication Object Table

## 6.2 LINKED WORKING MODE COMMUNICATION OBJECT

### 6.2.1 “DISABLE FUNCTION” COMMUNICATION OBJECT

Num...	Name	Object Function	Description	Group Address...	Length	R	W	T	U	Data Type	Prior...
0	Button pair1, function disable	Button function disable			1 bit	C	-	W	-	switch	Low

Figure 6.2.1 “Disable function” Communication Object

Number	Function	Object name	Data	Flags
0,12,24,36	Button function disable	Button pair X, function disable	1bit	C, W
This object is used to disable button function, when receives “1”, function of the button is disabled, when receives “0”, function of the button is enabled. Function of the button is enabled when powered on by default.				

表 11 “Disable function”通讯对象表 Table 11 “Disable function” Communication Object Table

### 6.2.2 “SWITCHING” COMMUNICATION OBJECT

1	Button pair1,switching	Switching			1 bit	C	-	W	T	-	switch	Low
---	------------------------	-----------	--	--	-------	---	---	---	---	---	--------	-----

Figure 6.2.2 “Switching” Communication Object

Number	Function	Object name	Data	Flags
1,13,25,37	switching	Button pair X, switching	1bit	C, W, T
When the button is operated, the object will send telegram “1” to trigger switch ON, and telegram “0” to trigger switch OFF.				

able 12 “Switching” Communication Object Table

### 6.2.3 “DIMMING” COMMUNICATION OBJECT

1	Button pair1,dimming	Switching			1 bit	C	-	W	T	-	switch	Low
2	Button pair1,dimming	Relative dimming			4 bit	C	-	-	T	-	dimming control	Low

Figure 6.2.3 “Dimming” Communication Object

Number	Function	Object name	Data	Flags
1,13,25,37	switching	Button pair X, dimming	1bit	C, W, T
This object is used for short operation switching.				
2,14, 26,38	Relative dimming	Button pair X, dimming	4bit	C, T
This object is used for long operation relative dimming operation.				

Table 13 “Dimming” Communication Object Table

## 6.2.4 “BLIND” COMMUNICATION OBJECT

1	Button pair1,blind	Travel	1 bit	C	-	-	T	-	up/down	Low
2	Button pair1,blind	Adjust	1 bit	C	-	-	T	-	counter pulses (signe Low	

Figure 6.2.4 “Blind” Communication Object

Number	Function	Object name	Data	Flags
1,13,25,37	Travel	Button pair X, blind	1bit	C, T
This object is used to control the movement of the blind, when telegram “1” is sent, the blind will move down; when telegram “0” is sent, the blind will move up.				
2,14, 26,38	Adjust	Button pair X, blind	1bit	C, T
This object is used to stop the movement/control slats adjustment of the blind, when telegram “1” is sent, the slats will adjust down; when telegram “0” is sent, the slats will adjust up.				

Table 4 “Blind” Communication Object Table

## 6.2.5 “VALUE SENDER” COMMUNICATION OBJECT

1	Button pair1,value sender	Value switching	1 bit	C	-	-	T	-	switch	Low
---	---------------------------	-----------------	-------	---	---	---	---	---	--------	-----

Figure 6.2.5 “value sender rocker switch total” Communication Object

Number	Function	Object name	Data	Flags
1,13,25,37	Value switching	Button pair X, value sender	1bit/1byte/2byte/4byte	C, T
This object is used to send designated value to the Bus. The value range is determined by data type, different data types have different value ranges. Data type is determined by parameter “object type”.				

Table 15 “Value sender” Communication Object Table

## 6.2.6 “VALUE DIMMING” COMMUNICATION OBJECT

1	Button pair1,value dimming	Value	1 Byte	C	-	-	T	-	counter pulses (0.25' Low	
---	----------------------------	-------	--------	---	---	---	---	---	---------------------------	--

Figure 6.2.6 “value dimming” Communication Object

Number	Function	Object name	Data	Flags
1,13,25,37	Value	Button pair X, value dimming	1byte	C, T
This object is used to send designated value of absolute dimming to the Bus.				

Table 16 “Value dimming” Communication Object Table

## 6.2.7 “STEP-TYPE SWITCH” COMMUNICATION OBJECT

1	Button pair1,step-type switch	Switching stage 1	1 bit	C	-	-	T	-	switch	Low
2	Button pair1,step-type switch	Switching stage 2	1 bit	C	-	-	T	-	switch	Low
3	Button pair1,step-type switch	Switching stage 3	1 bit	C	-	-	T	-	switch	Low
4	Button pair1,step-type switch	Switching stage 4	1 bit	C	-	-	T	-	switch	Low
5	Button pair1,step-type switch	Switching stage 5	1 bit	C	-	-	T	-	switch	Low

Figure 6.2.7 “Step-type Switch” Communication Object

Number	Function	Object name	Data	Flags
1~5, 13~17, 25~29, 37~41	Switching stage 1~5	Button pair X, step-type	1bit	C, T
These 5 objects can send maximum 5 data once to the Bus.				

Table 17 “Step-type Switch” Communication Object Table

## 6.3 “LED FUNCTION” COMMUNICATION OBJECT

48	LED1 function	Status	1 bit	C	-	W	T	U	switch	Low
49	LED1 function	Alarm	1 bit	C	-	W	-	U	switch	Low

Figure 6.3 “LED function” Communication Object

Number	Function	Object name	Data	Flags
48,50,52,54,56,58,60,62	Status	LED X, function	1bit	C, W
If the “LED function enable” parameter is set to “active”, the object “status” is enabled and used to receive status feedback to turn on LED indicator.				
49,51,53,55,57,59,61,63	Alarm	LED X, function	1bit	C, W
If the “alarm function” parameter is set to “active”, the object “alarm” will be enabled. The LED will flash if the object receives an ON telegram. If the object receives an OFF telegram, the LED will no longer flash.				

Table 18 “LED function” Communication Object Table