Product Manual

ABB i-bus® KNX
Universal I/O Concentrator
UK/S 32.2

Intelligent Installation Systems

This manual describes the function of the Universal I/O Concentrator UK/S 32.2 with its application program *Binary Input Display 32f/1*.
Subject to changes and errors excepted.

Exclusion of liability:
Despite checking that the contents of this document match the hardware and software, deviations cannot be completely excluded. We therefore cannot accept any liability for this. Any necessary corrections will be inserted in new versions of the manual.
Please inform us of any suggested improvements.

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1 General

The Universal I/O Concentrator UK/S 32.2 is used for operation and display of building functions via push buttons and signal lamps.

This manual provides you with detailed technical information relating to the device, its installation and programming. Furthermore, you will find application examples for effective device usage in the last section of the manual.

1.1 Product and functional overview

The Universal I/O Concentrator UK/S 32.2 has 32 channels for connection of conventional push buttons (input operation) or signal lamps (output operation). The operating mode of every channel can be parameterised individually.

An additional auxiliary voltage supply of 12 V DC or 24 V DC is required for operation. Power supplies of types NT/S 12.1600 or NT/S 24.800 are recommended for this purpose.

An exceptionally comprehensive and clearly arranged functionality permits usage in the most differing fields of application. The following list provides and overview:

Operation of illumination	Switching and dimming of lamps. It is possible to operate dimmable lighting using a single push button (alternately brighter / darker)
Operation of blinds and shutters	Movement commands and lamella adjustment of shutter drives operated by electric motors.
Sending values	Sending of fixed values at the touch of a button, e.g. temperature or brightness values
Operation of scenes	Scenes can be recalled and/or saved with a long button push.
Control of incandescent lamps or LED's	It is possible to switch the lamps on/off. Lamps which are switched on can be switched off or flash automatically after a defined time.
Operation in switch sequences	It is possible to operate several loads using a single button in a defined switching sequence.
Operation via multiple operation	Multiple successive short operations of a button can be used to switch different loads.

Each channel of a device can assume one of the functions described above.

2 Device technology

The Universal I/O Concentrator has 32 freely programmable channels, each with a terminal for the connection of floating contacts or signal lamps.

This for example, allows the control of operating or display panels. The device requires an external auxiliary voltage supply.

Each channel can be separately programmed as an input or output.

When operated as an input a push button / switch is typically connected to a channel.
It can trigger a command, e.g. to switch, dim or to actuate a shutter control.

The channels that are used by the outputs can switch signal lamps or LEDs either normally, inverted or make them flash.
In operation the device is suitable for displaying processing of a fault signal in conjunction with the Fault Signalling Module SMB/S 1.1.

2.1 Technical data

Power supply	- Operating voltage	21...30 V DC, made available by the bus
	- Current consumption via the bus	max. 12 mA
	- Auxiliary voltage	Nominal values: 12 / 24 V DC permissible: 10 ... 30 V DC Ripple: < 5% Reverse voltage protection Device current consumption: max. 35 mA
	- Leakage loss	max. 2.5 W at 24 V DC max. 1.9 W at 12 V DC (at max. channel loading)
Inputs/outputs	- Number	32, can be individually configured as inputs or outputs
	- Permitted line length	max. 10 m
Input	- Sampling voltage U_n of the inputs	Equal to the auxiliary voltage (12 / 24 V DC)
Output	- Signal level of the outputs	Equal to the auxiliary voltage (12 / 24 V DC)
	- Output current	Max. 80 mA per output
	- Permitted load type	Resistive
	- Safety	Short-circuit protected, overload protected
Connections	- Inputs/outputs	Plug-in screw terminals
	- KNX	Bus connection terminal
Operating and display elements	- LED (red) and button	For assignment of the physical address
Enclosure	- IP 20	To DIN EN 60529
Safety class	- II	To DIN EN 61140
Isolation category	- Overvoltage category	III to DIN EN 60664-1
	- Pollution degree	2 to DIN EN 60664-1
Temperature range	- Operation	-5° C ... + 45° C
	- Storage	-25° C ... + 55° C
	- Transport	-25° C ... + 70° C
Ambient conditions	- Maximum air humidity	93%, no condensation allowed
Design	- Modular installation device (MDRC)	Modular installation device, ProM
	- Dimensions	90 x 72 x 64 mm (H x W x D)
	- Mounting width	4 modules at 18 mm
	- Mounting depth	68 mm
Installation	On 35 mm mounting rail	To DIN EN 60 715
Mounting position	As required	
Weight	0.15 kg	
Housing, colour	Plastic housing, grey	
Approvals	KNX to EN 50 090-1, -2	Certification
CE mark	In accordance with the EMC guideline and low voltage guideline	

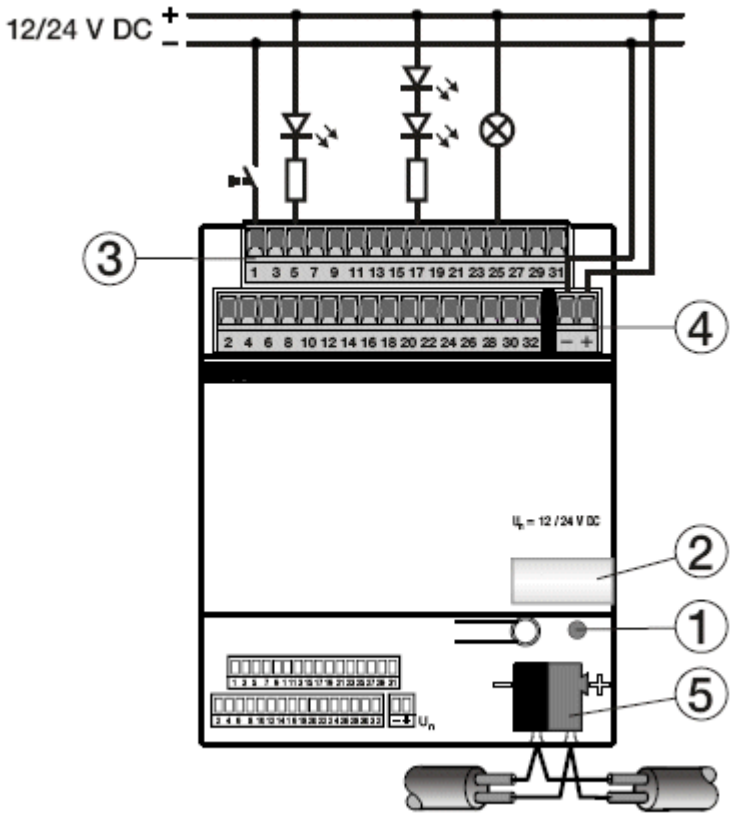
Application program	Number Communication objects	Max. number of group addresses	Max. number of associations
Binary Input Display Heating 32f/1	227	254	255

Note The programming requires ETS2 V 1.3 or higher. If ETS3 is used a ".VD3" type file must be imported. The application program can be found in the ETS2 / ETS3 at "ABB / Display and visualisation / Binary input and output".

Note: The device does not support the ETS encryption function. If you inhibit access to all devices of the project with a "BA password" (ETS2) or "BCU code" (ETS3), it has no effect on this device. Data can still be read and programmed.

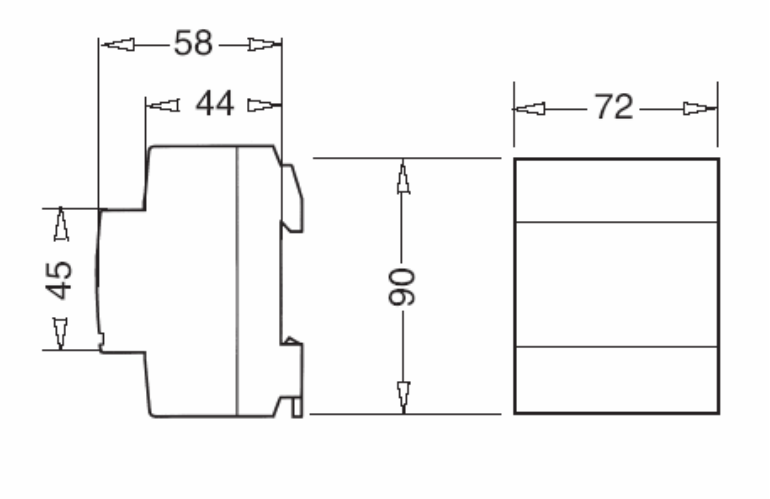
2.2 Circuit diagram

The maximum length of the connection cables is 10 m.



1 Programming LED
2 Label carrier
3 Input/output contacts
4 Auxiliary voltage supply connection
5 Bus terminal connection

2.3 Dimension drawing



2.4 Assembly and installation

The mounting position of the device can be selected as required.

Accessibility to the device for the purpose operation, testing, visual inspection, maintenance and repair must be must be provided (compliant to DIN VDE 0100-520).

3 Commissioning

3.1 Overview

The Universal I/O Concentrator UK/S 32.2 features the application program "*Binary Input Display 32f/1"*. The following operating modes can be set individually for each input:

Switch sensor	For switching the lighting or reading a floating contact (relay) Distinction between short/long operation and cyclical sending of the contact state are possible.
Switch/dimming sensor	For switching/dimming the lighting Start-stop dimming and stepwise dimming as well as dimming via a single push button are possible.
Shutter sensor	For movement/lamella adjustment of a blind or a shutter Eight preset operating responses are possible in total.
Value / scene / forced operation	For sending values of different data types (e.g. temperature values) It is possible to send different values or data types after a short/long operation, activation/deactivation of the forced control of actuators is also possible The function "Scene" sends a 1-Byte value for recalling or saving a scene whose value is stored in the actuator.
Control LED / incandescent lamp	For controlling an LED Switching and flashing (time limited and at different flashing frequencies) as well as usage as an orientation light are possible.
Switching sequence	For the operation of several actuator groups consecutively The actuators are switched in preset sequences. A selection between different sequences can be made.
Multiple operation	For triggering of different functions depending on the frequency of actuation For example, all the illumination in a room can be switched on by pressing the button twice, whereas pressing the button once will only switch individual lamps. Even a long actuation can be detected.
DIAGNOSTICS	This function allows the detection of a defective channel, which for example has occurred due to the connection of an incorrect load.

Supplied state

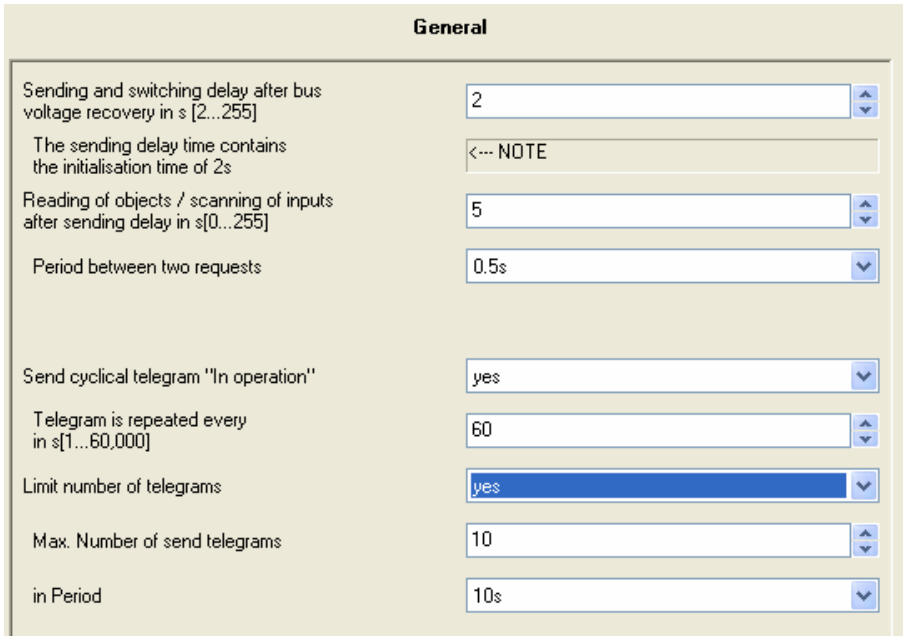
The device is assigned with the physical address 15.15.255 in the factory. The application program is preloaded in the factory. If required the application program can be reloaded by discharging the device entirely.

A long download of several minutes may result if the application program is changed or after a discharge.

3.2 Parameters and communication objects

3.2.1 "General" parameter window

In this parameter window the functions which apply for the entire device can be set.



Sending and switching delay after bus voltage recovery in s [2...255]

Options: 2...255 s

Only telegrams are received during the send and switching delay. The telegrams are not processed however and the outputs remain unchanged. No telegrams are sent on the bus.

A starting time of about 2 seconds (reaction time until the processor is ready to function) is included in the sending and switching delay.

What happens on a bus voltage failure?

The device has no function without bus voltage. As long as the auxiliary voltage supply is available, the state of the channels which are programmed as outputs will be frozen.

How does the device behave after bus voltage recovery?

Directly after a bus voltage recovery all object values will initially have the value "0". The behaviour of the input channels is dependent on the operating mode (see below). The state of the output channels is programmable. The output remains in this state as long as the object value of the output channel has not been updated via the bus.

If the input is actuated at bus voltage recovery, the device will behave as if the actuation commenced at the end of the initialisation time.

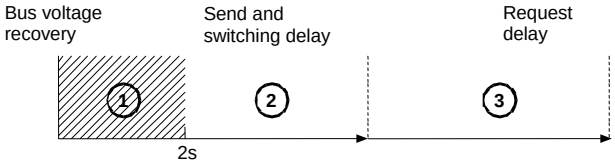


Fig. 1: Behaviour after bus voltage recovery

(1): Initialisation time

The device does not function during the initialisation time (takes about 2 seconds). Received telegrams are ignored.

(2): Sending and switching delay time

Only telegrams are received during the send and switching delay.
The telegrams are not processed however and the outputs remain unchanged. No telegrams are sent on the bus.

After the sending and switching delay the device will behave as follows:

If the state of an input has changed, the object values are updated and sent on the bus if necessary. If the device receives a telegram during the send and switching delay, the state of the output is updated after the send and switching delay has timed out.

If objects are read during the sending and switching delay (e.g. by a visualisation system), these read requests are stored and a response is sent after the send and switching delay has been completed.

(3): Request delay

The individual channels are updated (refreshed) after the request delay.

If the channel is an input: if programmed as such, the state is requested and the new object value is sent on the bus if necessary.

If the channel is an output: if programmed as such, the object value is read via the bus.

In order to reduce the traffic load on the bus, a minimum time between two telegrams can be defined in the parameters.

Particular behaviour of the individual operating modes

The behaviour after bus voltage recovery depends on the channel operating mode. The following list provides an overview:

Mode	**Behaviour after bus voltage recovery**
Switch sensor	If a distinction is made between short and long operation, or if the “UM” value is set in one of the “Reaction on closing/opening the contact” parameters, no telegram will be sent on bus voltage recovery. Otherwise the behaviour can be set in the parameters..
Switch/dimming sensor	No telegram is sent on the bus.
Shutter sensor	No telegram is sent on the bus.
Value / scene / forced operation	The behaviour is programmable. Object values are overwritten (updated) by the parameterised values.
Control LED / incandescent lamp	The output state can be set in the parameters.
Switching sequence	No telegram is sent on the bus.
Multiple operation	No telegram is sent on the bus.

Reading of objects / scanning of inputs after sending delay in s [0...255]

Options: 0 ... 255

After bus voltage recovery the device can read object values from the bus in order to update the state of an output. Furthermore, the state of an input can be scanned and sent on the bus. This can be set in the parameters.

In this parameter a time can be set in order to delay the traffic on the bus. In this way the parameter can assist in reducing the bus load after bus voltage recovery.

Period between two requests

Options: 0.1s / 0.2s / 0.5s / 1.0s

Here a minimum time between sending of two telegram requests is set and applies when the device requests the object states via the bus after bus voltage recovery. This assists in reducing the load on the bus after recovery of the bus voltage.

Send cyclical telegram "In operation"

Options: yes / no

The *In operation* object indicates the correct function of the device on the bus. This cyclic telegram can be monitored by an external device. The following parameters are visible:

Telegram is repeated every in s [1...60,000]

Options: 1...60...60.000

Here a time interval is set which the object *In operation* uses to cyclically send a telegram.

Limit number of telegrams

Options: no/yes

A telegram limitation is implemented to control the bus load created by the device.

With the selection yes, the parameters *Max. Number of send telegrams* and *in Period* are visible.

Max. Number of send telegrams

Options: 1...20...255

In Period

Options: 50ms / 100ms / ... / 10s / ... / 30s / 1min

This parameter sets the number of telegrams which can be sent by the device within a period. The telegrams are sent as quickly as possible at the start of a period.

How does the telegram rate limitation function?

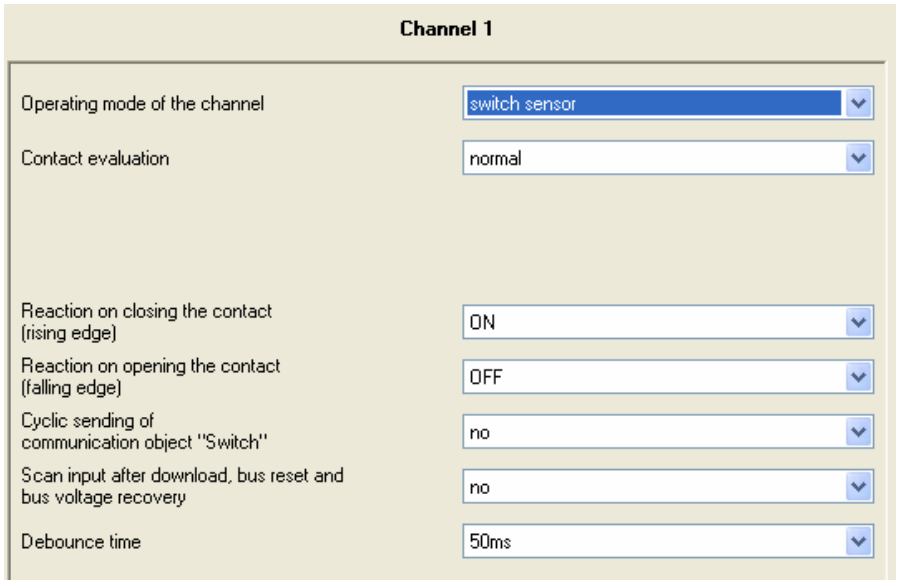
It counts the number of telegrams sent within a period. As soon as the *Limit number of telegrams* is reached, no further telegrams are sent on the bus until the end of the period. A new period commences at the end of the previous period. The telegram counter is reset to zero and sending of telegrams is allowed again.

3.2.1.1 General communication objects

No.	Function	Object name	Data type	Flags
224	**In operation**	**System**	**1 Bit EIS1 DPT 1.001**	**C, R, T**
Cyclically sends a 0 or a 1 on the bus. This device can be used to monitor the life signs of the device, e.g. via a monitoring module.				
225	**Lamp test**	**System**	**1 Bit EIS1 DPT 1.001**	**C, W**
Via this object, all channels which are set as outputs for control of an LED or an incandescent lamp are forcibly switched on. This function has the highest priority. This means, that the state of the outputs may not be changed when the lamp test is switched on. This also applies for the *DIAGNOSTICS* mode. After the lamp test is switched off the output will return to its original state. 0: Lamp test not active 1: Lamp test active, all lamps are forcibly switched on				
226	**Fault of auxiliary supply**	**System**	**1 Bit EIS1 DPT 1.001**	**C, T**
This object indicates the state of the12/24 V DC auxiliary supply. 0: Auxiliary voltage is OK 1: Auxiliary voltage fault				

3.2.2 “Switch sensor” mode

The *Switch sensor* mode is described in the following.



Contact evaluation

Options: normal
Distinction between long and short operation
Wait for minimum signal time

Option *normal*: The device can send a value when opening or closing a contact.

Option *Distinction between long and short operation*: This setting allows a different value to be sent depending on if a long or short operation has occurred.

Option *Wait for minimum signal time*: In this case the signal must be present for a minimum duration before the actuation is valid. Otherwise the behaviour is the same as with the *normal* setting.

3.2.2.1 Parameter with setting “normal”

If the value *normal* is set in the *Contact evaluation,* the following parameters are visible:

Reaction on closing the contact (rising edge)

Options: ON
OFF
Toggle
no reaction
End cyclic sending

Reaction on opening the contact (falling edge)

Options: ON
OFF
Toggle
no reaction
End cyclic sending

For each edge it is possible to set if the object value is to be *switched ON, OFF* or *TOGGLE*, or if *no reaction* should occur.

The *end cyclic sending* only has an effect if the cyclic sending of the *Switch* communication object has been activated.

Cyclic sending of object “Switch” communication object

Options: no
if “Switch” = ON
if “Switch” = OFF
always

Here you set the conditions under which the communication object *Switch* is cyclically sent. If *always* is set it is sent independently of the object value.

Telegram is repeated every in s [1...60,000]

Options: 1 ... 30 ... 60.000

Here the time used between cyclically sent telegrams is set.

What is cyclic sending?

Cyclic sending enables the communication object “Switch” to send automatically at a fixed interval.

Why is cyclic sending required?

Cyclic sending is used for example to monitor important sensors.
A receiving device expects the telegram at regular intervals. If it is not received for a certain time, the device can for example, indicate a fault.

How exactly does cyclic sending function?

If cyclic sending is only carried out for a specific object value (ON or OFF), this condition refers to the value of the communication object.

It is therefore possible in principle to start the cyclic sending by sending a value to the communication object *Switch*. As this reaction is generally unwanted, the *Write* flag has to be deleted.

When the *Switch* object changes the object value is sent immediately on the bus and the transmission cycle time restarts.

Scan input after download, bus reset and bus voltage recovery

Options: no/yes

Option *no*: No action is actively undertaken after a download, bus reset or bus voltage recovery.

Option *yes*: The state of the input is scanned and the respective value is sent on the bus.

Debounce time

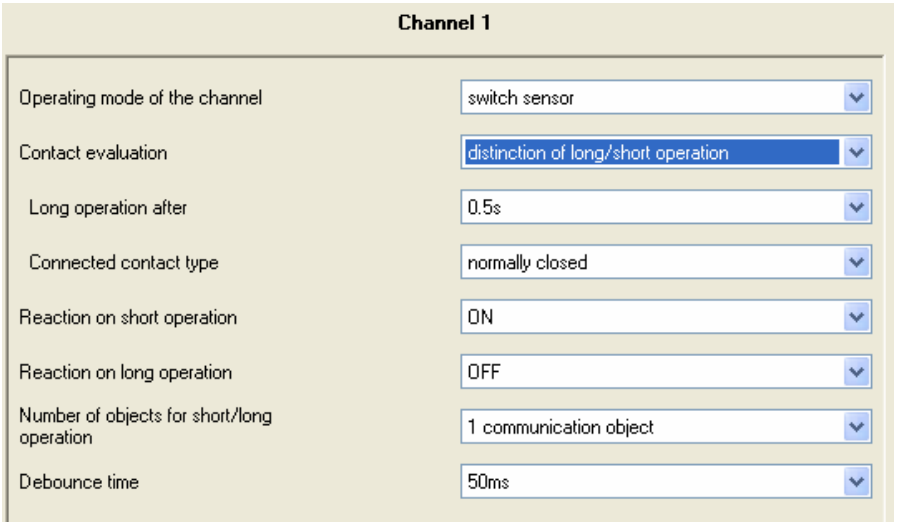
Options: 20ms / 30ms / 50ms / 70ms / 100ms / 150ms / 200ms

Debouncing prevents unwanted multiple operations of the input, e.g. due to bouncing of the contact.

A more detailed explanation of the function can be found in section 4.2.

3.2.2.2 Parameters with setting “Distinction between long and short operation”

The following parameters are visible if for the *Contact evaluation* the value *Distinction between long and short operation* has been selected. More details concerning the type of contact evaluation can be found in section 0.



Long operation after

Options: 0,2s / 0,3s / 0,4s / <u>0,5s</u> / … / 9s / 10s

Here the time period T_L after which an actuation is considered a “long” operation is set.

Connected contact type

Options: open / <u>closed</u>

Closed: Input is closed with actuation (normally open contact).
open: Input is opened with actuation (normally closed contact)

Reaction on short operation
Reaction on long operation

Options: ON
OFF
Toggle
no reaction

For every operation (short or long) it is set if the object value is *ON, OFF* or *TOGGLE*, or if *no reaction* should be occur. The object value is updated as soon as it has been determined if a short or long operation has occurred.

Number of objects for short/long operation

Options: <u>1 communication object</u>
2 communication objects

In order to differentiate between long and short operation, a further communication object can be released by the option 2 *communication objects*. This additional object reacts exclusively to long operations, where as the existing reacts exclusively to short operation.

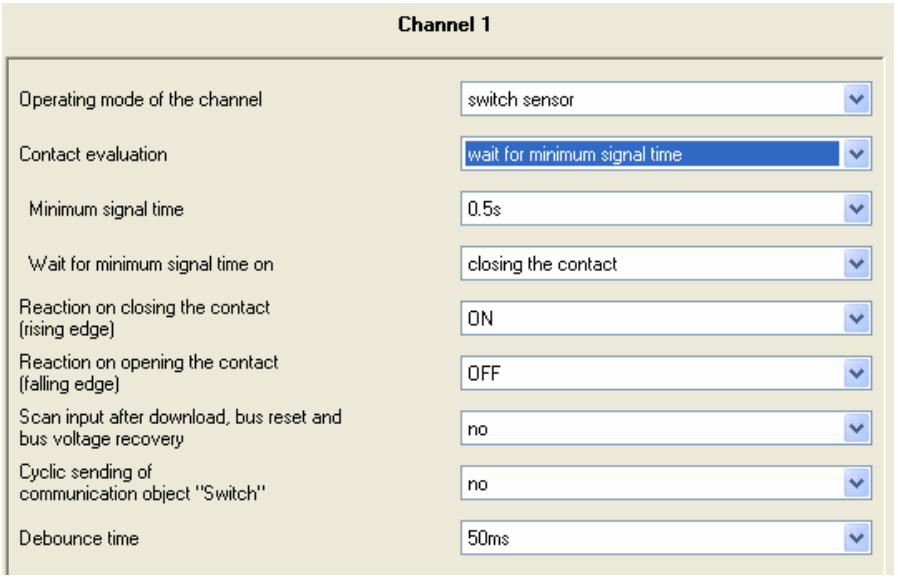
Debounce time

Options: 20ms / 30ms / 50ms / 70ms / 100ms / 150ms / 200ms

Debouncing prevents unwanted multiple operations of the input, e.g. due to bouncing of the contact. A more detailed explanation of the function can be found in section 4.2.

3.2.2.3 Parameters with setting “Wait for minimum signal time”

The following parameters are visible if the value *Wait for minimum signal time* has been set in the parameter *Contact evaluation*. More details concerning the type of contact evaluation can be found in section 0.



Minimum signal time

Options: 0,2s / 0,3s / 0,4s / 0,5s / … / 9s / 10s

The minimum signal time defines the length of time that a signal must be present before it is detected. Short signals are ignored.

Wait for minimum signal time on

Options: Closing the contact
Opening the contact
Opening and closing the contact

Here you set the signal edge for which the minimum signal time is valid.

With the setting *Closing the contact* the minimum signal time is only considered after closing of the contact. On the other hand opening the contact is detected immediately.

The description of the other parameters corresponds with the setting *Contact type* = *normal*, see section 0.

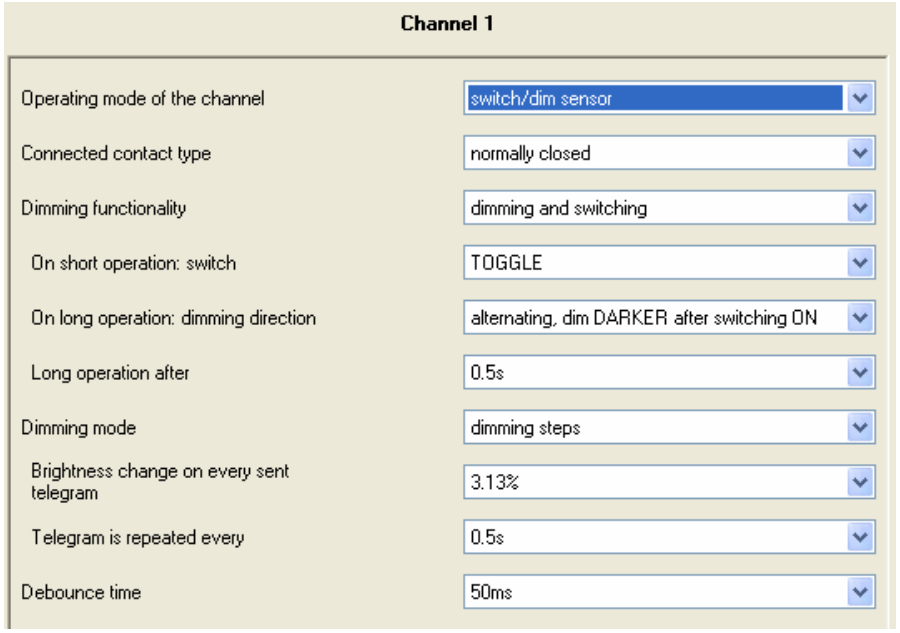
Detailed explanations of the minimum signal time function can be found in section 0.

3.2.2.4 Communication objects “Switch sensor”

No.	Function	Object name	Data type	Flags
0	**Block**	**Channel 1, switch sensor**	**1 Bit EIS1 DPT 1.003**	**C, W**
0: Enable input 1: Block input Using the communication object *Block* the function of the input circuitry can be blocked or enabled. A blocked input behaves as if there has been no change of the input signal. The input objects continue to be available. When a blocked input is enabled the input is scanned. A programmed reaction is undertaken with a change of the state compared to the state before the block. If the input is just being actuated as it is being enabled, the channel behaves as if the actuation has commenced at the end of the block. The actuation is undertaken if the input is blocked during actuation..				
1	**Switch**	**Channel 1, switch sensor**	**1 Bit EIS1 DPT 1.001**	**C, W, T**
0: OFF 1: ON In accordance with the parameter setting, this communication object can be switched by actuation of the ON, OFF or TOGGLE input.				
2	**Switch, long operation**	**Channel 1, switch sensor**	**1 Bit EIS1 DPT 1.001**	**C, T**
0: OFF 1: ON This object is only visible if the parameter *Distinction between long and short operation = yes,* and the parameter *Number of objects for short/long operation = 2 communication objects*.. This additional object is only sent on long operation. If this object is visible, the *Switch* object only reacts with a short operation.				

3.2.3 Operating mode “Switch/Dim sensor”

The operating mode “Switch/dim sensor” is described in the following.



Connected contact type

Options: open / closed

Closed: Input is closed with actuation (normally open contact).
open: Input is opened with actuation (normally closed contact)

Dimming function

Options: Dimming and switching
Only dimming

This parameter is used to define if the lighting can only be dimmed *(Only dimming)* or if additional switching is also permitted *(Dimming and switching)*. In the latter case, a long operation actuates dimming and a short operation actuates switching..

The advantage of the *Only dimming* function is that no distinction is made between short and long actuation. The dim command is issued immediately on actuation. It is not necessary to wait for a long actuation.

How does 1 button dimming function?

One button dimming means that dimmable lighting is operated via a single button. Each dim actuation is sent alternately with a BRIGHTER or DARKER dim telegram.

In order to activate the **1-button dimming**, set the parameter *On short operation* to the value *Toggle* and in parameter *On long operation* set the value *Dimming direction changing*. With the setting *Dimming direction changing, after ON = DARKER* the dimming direction after switch on is always DARKER.

The function is as follows: If the communication object *Switch* = 0, a BRIGHTER telegram is sent at all times. In order to evaluate the switch feedback of the actuator, the *Write* flag of the object *Switch* is set.

The following table shows the function in detail: **Value of the “Switch” object**	**Value of the last dim telegram**	**Reaction to long operation (sent dim telegram)**
OFF	DARKER	BRIGHTER
OFF	BRIGHTER	BRIGHTER
ON	DARKER	BRIGHTER
ON	BRIGHTER	DARKER

Tab. 1 : Dim function “1 button dimming”

How does 2 button dimming function?

If **“2 button dimming”** is required, two channels must be used for dimming with one for switch on / brighter and the other for switch off / darker.

The corresponding values must be set in the parameters *Reaction on short (or long) operation*: *ON* and *Dim BRIGHTER* for one button and *OFF* and *Dim DARKER* for the other button.

The objects “Switch” and “Dim” of both channels are to be assigned with the same group addresses.

The user has the highest possible level of freedom using this solution.

On short operation: Switch

Options: ON / OFF / <u>TOGGLE</u> / no reaction

This parameter is visible if in the parameter *Dimming functionality* the value *Switch and Dimming* are set.

A short operation changes the value of the object *Switch*. This parameter sets if the object *Switch* toggles with short operation (typically: 1 button dimming) or only switches ON or OFF (typically: 2 button dimming.

On long operation: dimming direction

Options: BRIGHTER
DARKER
TOGGLE
Toggle, after switch on = BRIGHTER
<u>Toggle, after switch on = DARKER</u>

This parameter defines the value which the object *Dim* sends on the bus:

Option *BRIGHTER*: The object sends the BRIGHTER command.

Option *DARKER*: The object sends a DARKER command.

Option *TOGGLE*: The object alternately sends a BRIGHTER and DARKER command.

Option *toggle, after switch on = BRIGHTER* The object alternately sends a BRIGHTER and DARKER command. A BRIGHTER command is always sent after a switch on command.

Option *toggle, after switch on = DARKER* The object alternately sends a BRIGHTER and DARKER command. A DARKER command is always sent after a switch on command.

Long operation after

Options: 0,2s / 0,3s / 0,4s / 0,5s / ... / 9s / 10s

This parameter is visible if in the parameter *Dimming functionality* the value *Switch and Dimming* are set. Here the time period T_L after which an actuation is considered a “long” operation is defined.

Dimming mode

Options: Start-stop-dimming
Dimming steps

Start-stop-dimming is the standard dimming mode. It starts the dimming process with a telegram BRIGHTER or DARKER and ends the dimming process with a STOP telegram. Cyclic sending of the telegram is not necessary in this case.

With *Dimming steps* the dimming telegram is sent cyclically during a long operation. The STOP telegram ends the dimming process at the end of operation.

Brightness change on every sent telegram

Options: 100% / 50% / 25% / 12,5% / 6,25% / 3,13% / 1,56%

This parameter is only visible with the *Dimming steps* option. This parameter is set to change the brightness (in percent) which is cyclically sent with every dim telegram.

Telegram is repeated every

Options: 0,2s / 0,3s / 0,4s / 0,5s / … / 9s / 10s

The dimming telegram is sent cyclically during a long operation if *Dimming steps* is set. The cycle time for sending corresponds with the time interval between two telegrams during cyclical sending.

Debounce time

Options: 20ms / 30ms / 50ms / 70ms / 100ms / 150ms / 200ms

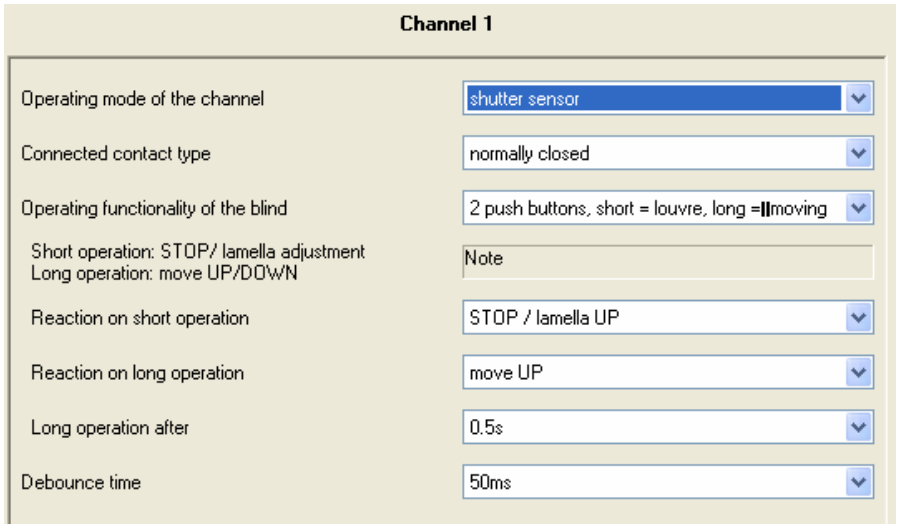
Debouncing prevents unwanted multiple operations of the input, e.g. due to bouncing of the contact. A more detailed explanation of the function can be found in section 4.2.

3.2.3.1 Communication objects “Switch/Dim sensor”

No.	Function	Object name	Data type	Flags
0	**Block**	**Channel 1, Switch/Dim sensor**	**1 Bit EIS1 DPT 1.003**	**C, W**
0: Enable input 1: Block input Using the communication object *Block* the function of the input circuitry can be blocked or enabled. A blocked input behaves as if there has been no change of the input signal. The input objects continue to be available. When a blocked input is enabled the input is scanned. A programmed reaction is undertaken with a change of the state compared to the state before the block. If the input is just being actuated as it is being enabled, the channel behaves as if the actuation has commenced at the end of the block. The actuation is undertaken if the input is blocked during actuation..				
1	**Switch**	**Channel 1, Switch/Dim sensor**	**1 Bit EIS1 DPT 1.001**	**C, W, T**
This object is visible if in the parameter *Dimming functionality* the value *Switch and Dimming* is set. The object value can be switched to ON, OFF or TOGGLE in accordance with the parameter setting with a short operation. With 1-switch dimming this object should be linked with the switch feedback of the dimming actuator via a group address (receiving group address). Thus the input is informed via the current switching state of the dimming actuator.				
2	**Dimming**	**Channel 1, Switch/Dim sensor**	**4 Bit EIS2 DPT 3.007**	**C, T**
A long operation at the input has the effect that a *BRIGHTER* or *DARKER* dim command is sent via this communication object on the bus. A STOP command is sent at the end of actuation.				

3.2.4 “Shutter sensor” mode

The operating mode “Shutter sensor” is described in the following.



Connected contact type

Options: open / closed

Closed: Input is closed with actuation (normally open contact).
open: Input is opened with actuation (normally closed contact)

Operating functionality of the blind

Options: See table

These parameters define the type of operation. The following list provides an overview of the operating modes:

1 push button, (short = lamella, long = moving)	
Short operation	Stop/lamella adjustment; Opposite direction to the last movement command* To return to lamella adjustment, the blind must be raised or lowered briefly.
Long operation	Alternately “MOVE UP” or “MOVE DOWN”
1 push button, (short = moving, long = lamella)	
Short operation	Alternately “MOVE UP” or “MOVE DOWN”
Long operation	STOP/lamella adjustment (cyclical sending); Opposite direction to the last movement or stepping command*
1 push button, (moving only)	
On operation	The following commands are sent in sequence: ... →“Move UP“ →“Stop/Lamella adjustment. UP“ → “Move DOWN AB“ →“Stop/Lamella adjustment DOWN“ →... *
1 switch operation (moving only)	
On operation	Alternately “MOVE UP” or “MOVE DOWN”
End of operation	Stop/Lamella adjustment *

2 push button (short = lamella, long = moving)	
Short operation	“Stop/Lamella adjustment UP” or “… DOWN“ (programmable)
Long operation	“MOVE UP” or “MOVE DOWN” (programmable)
2 switch / push button operation (moving only)	
On operation	“MOVE UP” or “MOVE DOWN” (programmable)
End of operation	“Stop/Lamella adjustment”
2 push button, (moving only)	
On operation	The following commands are sent in sequence: ... →“Move UP“ →“Stop/Lamella adjustment. UP“ →... or ... →“Move DOWN“ →“Stop/Lamella adjustment. DOWN“ →...
2 push button operation (lamella only)	
On operation	“Stop/Lamella adjustment UP” or “… DOWN“ is sent cyclically on the bus

*** Note:** If the actuator signals the upper limit position, (see object *Upper limit position*), it will move downwards with the next movement command. The same applies for the lower limit position.

In “1 push button/switch operation”, the last direction of movement is determined via the last update of the object *Shutter UP/DOWN*.

How does the operation of a shutter function using a push button?

The shutter function (movement and lamella adjustment) can be controlled completely using a single push button.

With operation via a normal push button normally
“Short = lamella, long = moving“ (see above) is used. The operation is as follows:

With a long button push the lamella moves opposite to the last direction of movement. The user can stop movement with a short button push. Further short button pushes adjust the lamella against the last direction of movement.

What must be observed with the operation of a shutter using several separate push buttons?

In this case the object “Shutter UP/DOWN“ and “STOP / lamella adjustment“ of the channels which are connected to the push buttons have each to be connected to the same group addresses.

Accordingly, a channel can “listen” to the commands of another channel. In this way it always knows the last direction of movement.

What are the objects “Upper limit position” and “Lower limit position” for?

Using these objects the shutter actuator informs if the shutter is in the upper or lower limit position. The Universal I/O Concentrator then knows that the shutter has been moved to the upper limit position for example, using a central command. The next movement command from a push button will always trigger a “downward” movement.

The latest generation of ABB shutter actuators support the objects “Upper limit position” and “Lower limit position”. If other shutter actuators are used, 1-button control is not recommended.

Reaction on operation

Options: dependent on the operating functionality

This parameter is visible if there is no distinction between short and long actuation. It can be set whether the input triggers commands for movement upwards (*UP*) or downwards (*DOWN*).

Reaction on short operation
Reaction on long operation

Options: dependent on the operating functionality

This parameter is visible in operation if there is a distinction between short and long actuation. It can be set whether the input triggers commands for movement upwards (*UP*) or downwards (*DOWN*).

Long operation after

Options: 0,2s / 0,3s / 0,4s / 0,5s / ... / 9s / 10s

This parameter is visible in operation if there is a distinction between short and long actuation. Here the time period after which an actuation is considered a “long” operation is defined.

STOP/ lamella adj." is repeated every

Options: 0,2s / 0,3s / 0,4s / 0,5s / ... / 9s / 10s

This parameter is visible in operations in which the object *STOP / lamella adjustment.* is sent cyclically on the bus during long actuation. Here the time between two telegrams is set.

Debounce time

Options: 20ms / 30ms / 50ms / 70ms / 100ms / 150ms / 200ms

Debouncing prevents unwanted multiple operations of the input, e.g. due to bouncing of the contact. A more detailed explanation of the function can be found in section 4.2.

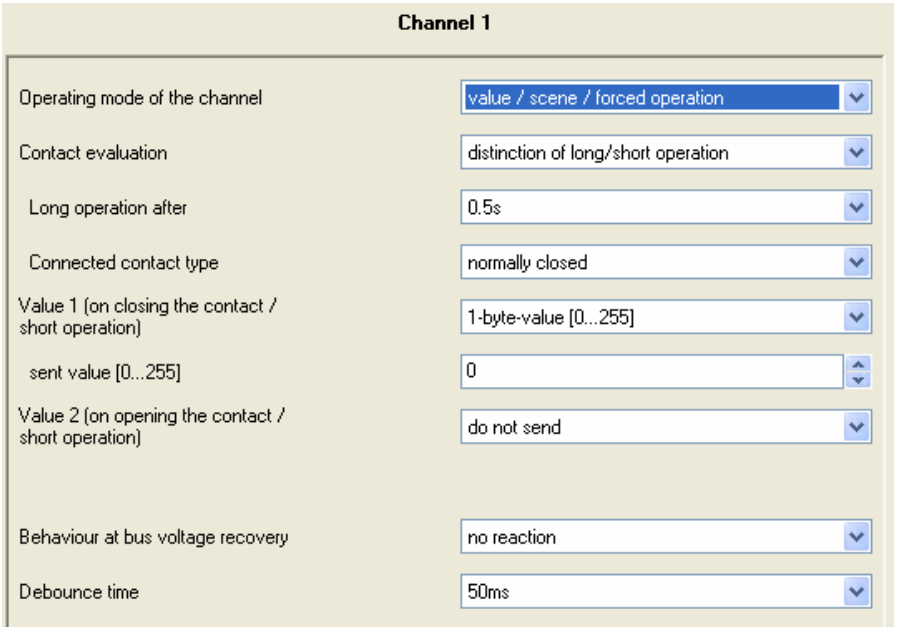
3.2.4.1 Communication objects “Shutter sensor”

No.	Function	Object name	Data type	Flags
0	**Block**	**Channel 1, shutter sensor**	**1 Bit EIS1 DPT 1.003**	**C, W**
0: Enable input 1: Block input Using the communication object *Block* the function of the input circuitry can be blocked or enabled. A blocked input behaves as if there has been no change of the input signal. The input objects continue to be available. When a blocked input is enabled the input is scanned. A programmed reaction is undertaken with a change of the state compared to the state before the block. If the input is just being actuated as it is being enabled, the channel behaves as if the actuation has commenced at the end of the block. The actuation is undertaken if the input is blocked during actuation..				
1	**Shutter UP/DOWN**	**Channel 1, shutter sensor**	**1 Bit EIS7 DPT 1.008**	**C, W, T**
This communication object sends a shutter motion command (UP or DOWN) to the bus. By receiving telegrams the device also recognises movement commands of another sensor. 0: Move up (UP) 1: Move down (DOWN)				
2	**Stop/Lamella adjustment**	**Channel 1, shutter sensor**	**1 Bit EIS7 DPT 1.007**	**C, T**
This communication object sends a STOP command or lamella adjustment. 0: STOP / Lamella adjustment UP 1: STOP / Lamella adjustment DOWN				

No.	Function	Object name	Data type	Flags
3	**Upper limit position**	**Channel 1, shutter sensor**	**1 Bit EIS1 DPT 1.002**	**C, W**
Using this object the shutter actuator indicates if it is in the upper limit position. The object is intended for 1-button operation. 0: Upper end limit not reached 1: Upper end limit reached **Note:** The communication object is important for 1-button operation.				
4	**Lower limit position**	**Channel 1, shutter sensor**	**1 Bit EIS1 DPT 1.002**	**C, W**
Using this object the shutter actuator indicates if it is in the lower limit position. The object is intended for 1-button operation. 0: Lower end limit not reached 1: Lower end limit reached **Note:** The communication object is important for 1-button operation.				

3.2.5 Operating mode “Value / scene / forced operation”

The operating mode *Value / Scene / Forced operation* is described in the following. The operating mode allows the sending of values of any data types.



Contact evaluation

Options: normal
Distinction between long and short operation
Wait for minimum signal time

Option *normal*: The device can send a value when opening or closing a contact. Value 1 is assigned to closing the contact and value 2 to opening of the contact.

Option *Distinction between long and short operation*: A distinction is made between short and long operation here. Value 1 is assigned with short operation and value 2 with long operation.

Option *Wait for minimum signal time*: Here value 1 is assigned to closing the contact and value 2 to opening of the contact. Furthermore, in this case the signal must be present for a minimum duration before the actuation is valid.

Long operation after

Options: 0,2s / 0,3s / 0,4s / 0,5s / ... / 9s / 10s

These parameters are visible in operation if for the *Contact evaluation* the value *Distinction between long and short operation* has been set. Here the time period after which an actuation is considered a “long” operation is defined.

Connected contact type

Options: open / closed

These parameters are visible in operation if for the *Contact evaluation* the value *Distinction between long and short operation* has been set.

Closed: Input is closed with actuation (normally open contact).
open: Input is opened with actuation (normally closed contact)

Minimum signal time

Options: 0,3s / 0,4s / 0,5s / … / 9s / 10s

The minimum signal time defines the length of time that a signal must be present before it is detected. Short signals are ignored.

Wait for minimum signal time on

Options: Closing the contact
Opening the contact
Opening and closing the contact

Here you set the signal edge for which the minimum signal time is valid.

With the setting *Closing the contact* the minimum signal time is only considered after closing of the contact. On the other hand opening the contact is detected immediately.

The description of the other parameters corresponds with the setting *Contact type = normal*, see section 0.

Detailed explanations of the minimum signal time function can be found in section 0.

Value 1 (on closing the contact / short operation)
Value 2 (on opening the contact / short operation)

Options: not send
1 Bit value [0/1]
2 Bit value [Forced operation]
1 Byte value [-128…127]
1 Byte value [0…255]
Recall 8 Bit scene
Store 8 Bit scene
2 Byte value [-32,768…32,767]
2 Byte value [0…65,535]
2 Bit value [Floating point]
4 Byte value [-2.147.483.648… 2.147.483.647]
4 Byte value [0…4.294.967.295]

This parameter serves for defining the data type which is sent when the contact is actuated.

sent value [...]

Options: dependent on the data type

This object value defines the value which is sent with the operation.

Reaction on bus voltage recovery

Options: no reaction
Scan input again
Send value 1
Send value 2

no reaction: No action is actively undertaken after a bus voltage recovery.

Scan input again: The state of the input is scanned and the respective value is sent on the bus. If the parameter type *Contact type* = *Distinction between long and short operation* is set, no reaction occurs.

Send value 1 or *Send value 2*: The device sends the respective value on the bus dependent on the input signal.

Debounce time

Options: 20ms / 30ms / 50ms / 70ms / 100ms / 150ms / 200ms

Debouncing prevents unwanted multiple operations of the input, e.g. due to bouncing of the contact. A more detailed explanation of the function can be found in section 4.2.

3.2.5.1 Communication objects “Value / scene / forced operation”

No.	Function	Object name	Data type	Flags
0	**Block**	**Channel 1, Value/forced op.**	**1 Bit EIS1 DPT 1.003**	**C, W**

0: Enable input
1: Block input

Using the communication object *Block* the function of the input circuitry can be blocked or enabled. A blocked input behaves as if there has been no change of the input signal. The input objects continue to be available.

When a blocked input is enabled the input is scanned. A programmed reaction is undertaken with a change of the state compared to the state before the block. If the input is just being actuated as it is being enabled, the channel behaves as if the actuation has commenced at the end of the block.

The actuation is undertaken if the input is blocked during actuation..

No.	Function	Object name	Data type	Flags
1	**Value 1: ... Value 2: ...**	**Channel 1, Value/forced op.**	**EIS variable DPT variable**	**C, T**

This communication object sends a value on the bus. The value and data type can be freely set in the parameters:

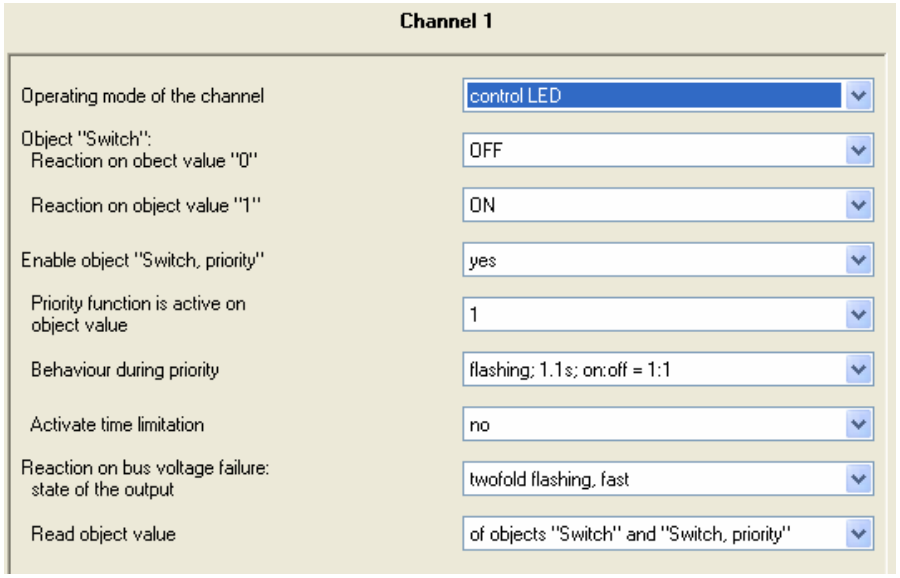
1 Bit [0 / 1]	EIS 1	DPT 1.001	switch command
2 Bit [0...3]	EIS 8	DPT 2.001	forced operation
1 Byte [0...255]	EIS 6	DPT 5.010	brightness, position
2 Byte [-32768...+32767]	EIS 10	DPT 7.001	value, signed
2 Byte [0...65535]	EIS 10	DPT 8.001	value, unsigned
2 Byte [floating point]	EIS 5	DPT 9.001	temperature
4 Byte [0...4294967295]	EIS 11	DPT 12.001	value, unsigned

*sends values with fixed exponent of 3

Note: By default the value objects of the “Write” flag are deleted (exception: 1 bit objects). Thus the object value cannot be changed via the bus. If this function is required, the “Write” flag must be set in the ETS. The object value is overwritten with the parameterised value after bus voltage recovery.

3.2.6 Operating mode “Control LED / incandescent lamp”

The operating mode “Control LED / incandescent lamp” is described in the following.

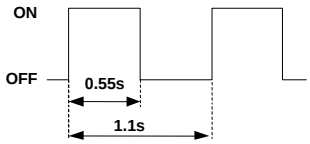


Object "Switch":
Reaction on object value “0”
Reaction on object value ”1”

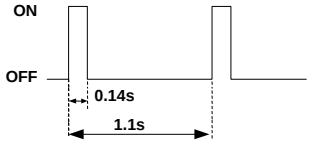
Options:
ON
OFF
Flashing; 140 ms; on:off = 1:1
...
Flashing; 9.0 s; on:off = 1:1
Flashing; 230 ms; on:off = 1:7
...
Flashing; 9.0 s; on:off = 1:7
Double flash; 280 ms
...
Double flash; 9.0 s

In this parameter, the reaction of the output dependent on the object value *Switch* is set. The output can switch on or off. Furthermore, the output can flash. Various flash periods and ratios can be set.

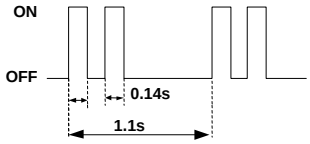
Examples for the settings:



Flashing; 1.1s; on:off = 1:1



Flashing; 1.1s; on:off = 1:7



Double flashing; 1.1s

Enable object "Switch, priority"

Options: yes / no

The object *Switch, Priority* enables the display of an important message, e.g. by flashing of the display LED. It has a higher priority than the object *Switch*.

Priority function is active on object value

Options: 0 / 1

Here you set the value at which the priority function is active in the *Switch, Priority* function.

Behaviour during priority

Options: ON
OFF
Flashing; 140 ms; on:off = 1:1
...
Flashing; 1.1 s; on:off = 1:1
...
Flashing; 9.0 s; on:off = 1:1
Flashing; 230 ms; on:off = 1:7
...
Flashing; 9.0 s; on:off = 1:7
Double flash; 280 ms
...
Double flash; 9.0 s

Here you set how the output reacts when the priority function is active. A more detailed explanation of the flashing functions can be found above under the description of the parameter *Object “Switch”: ...*

Activate time limitation

Options: yes / no

The priority function will deactivate automatically after an adjustable time.

Priority function deactivates after ... in s [1...60,000]

Options: Time, can be set in seconds

Here the time is set after which the priority function automatically deactivates.

Reaction on bus voltage failure: state of the output

Options: ON
OFF
Flashing
Flashing, quickly
Double flashing, quickly

The reaction of the output after bus voltage recovery is set here. Because the object values *Switch* and *Switch, Priority* have been lost by a bus failure, the outputs are set to the state defined in these parameters.

The set reaction remains until the object value *Switch* and if required *Switch, Priority* have been updated via the bus.

Using this function for example, the user can be informed that the displayed values have not yet been updated.

Read object value

Options: no
object "Switch" only
object "Switch, Priority" only
object “Switch” and "Switch, priority"

Here you define if the object values *Switch* and *Switch, priority* are read via the bus after bus voltage recovery.
This is useful if the sending devices do not send the object values themselves after bus voltage recovery.

After bus voltage recovery the objects *Switch* and *Switch, priority* have the value “0”. Only after the scanned objects have been read will the output assume the given state.

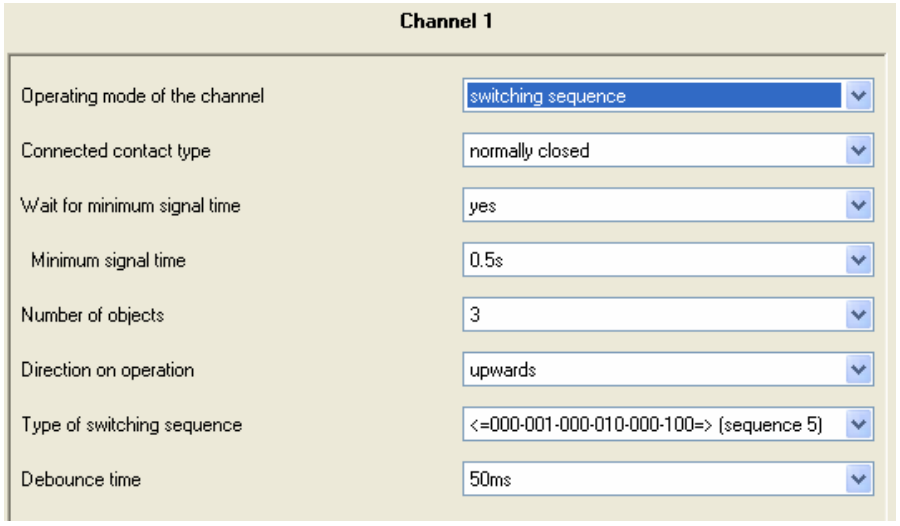
3.2.6.1 Communication objects “Control LED / incandescent lamp”

No.	Function	Object name	Data type	Flags
0	**Block**	**Channel 1, LED control**	**1 Bit EIS1 DPT 1.003**	**C, W**
0: Enable output 1: Block output Using the communication object *Block* the function of the output can be blocked or enabled. The output is forcibly switched off with the block. With an enable the output reassumes its normal state; this means it assumes the state of the object value *Switch* or *Switch, priority*.				
1	**Switch**	**Channel 1, LED control**	**1 Bit EIS1 DPT 1.001**	**C,W,T,U**
The object switches the LED ON and OFF or makes it flash. The output reaction can be set in the parameters.				
2	**Switch, priority**	**Channel 1, LED control**	**1 Bit EIS1 DPT 1.001**	**C,W,T,U**
Using this object the output can be set with a higher priority in a defined state. The object *Switch* is thus out of operation. The output can switch on, off or flash. This can be set in the parameters. Furthermore, in the parameter you can set if the priority function with object value “0” or “1” should be active.				

3.2.7 “Switching sequence” mode

The operating mode *Switching sequence* is described in the following.

It enables the modification of several object values in a defined switching sequence using a single push button.



What does the “Switching sequence” mode do?

The operating mode “Switching sequence” allows switch on or off of up to four objects (1 bit) in a defined sequence. Every time the button is switched one further step in the sequence occurs.

Example:

Name of switching sequence	**<=000-001-011-111-011-001=> (sequence 3)**		**All possibilities (sequence 2)**	
Object name	Switch 2	Switch 1	Switch 2	Switch 1
1st button push				
2nd button push				
3rd button push				
4th button push				

5th button push as with 1st button push

In this example two objects each (meaning: lighting groups) are switched.

How many lamps can be switched in a sequence?

Up to 4 objects can be switched in a switching sequence. Thus 4 lighting groups are possible.

Connected contact type

Options: open / closed

Closed: Input is closed with actuation (normally open contact).
open: Input is opened with actuation (normally closed contact)

Wait for minimum signal time

Options: yes / no

The minimum signal time defines the length of time that a signal must be present on the input before it is detected. Short signals are ignored.

Minimum signal time

Options: 0,2s / 0,3s / 0,4s / 0,5s / ... / 9s / 10s

The minimum signal duration is set here. Detailed explanations of the minimum signal time function can be found in section 0.

Number of objects

Options: 2 / 3 / 4

Here the number of communication objects (max. 4) is defined which are to be used in the switching sequence. The objects *Switch 1* to *Switch 4* are freely switched accordingly.

Direction on operation

Options: up / down

Here the direction of operation on actuation is set

Type of switching sequence

Options: => 000-001-011-111 (sequence 1)
All options (sequence 2)
<=000-001-011-111-011-001=> (sequence 3)
<=000-001-011-111=> (Sequence 4)
<=000-001-000-010-000-100=> (sequence 5)

The switching sequence can be selected here.

Commissioning – Operating mode “Switching sequence”

Which switching sequences are available?

1. 000-001-011-111 (Sequence 1)

This switching sequence switches on a further communication object with each successive actuation . Further actuations are ignored if all communication objects are switched on. For this reason at least two inputs are required where one counts upwards and the other counts downwards.

Note: The communication objects of both inputs must have the same group address assignment. With synchronization of several binary inputs the respective communication object should be linked with the same group address.

2. All options (sequence 2)

In this sequence all communication object combinations are undertaken successively. Only the value of a single communication object is changed each time. A good example of this switching sequence for example, is switching of two lighting groups in the sequence 00 – 01 – 11 – 10 – 00 ...

3. Switch sequence <=000-001-011-111-011-001=> (sequence 3)
This switching sequence switches on a further communication object with each successive actuation . If all communication objects are switched on, they are switched off successively commencing with the last one to be switched on.

Switching sequence		**Value of the communication objects**		
No.	**Short des.**	**Switch 1**	**Switch 2**	**Switch 3**
0	000	OFF	OFF	OFF
1	001	OFF	OFF	ON
2	011	OFF	ON	ON
3	111	ON	ON	ON
4	011	OFF	ON	ON
5	001	OFF	OFF	ON
0	...			

4. Switch sequence <=000-001-011-111-000=> (sequence 4)
This switching sequence switches on a further communication object with each successive actuation . If all communication objects are switched on, they are all switch off together.

Switching sequence		**Value of the communication objects**		
No.	**Short des.**	**Switch 1**	**Switch 2**	**Switch 3**
0	000	OFF	OFF	OFF
1	001	OFF	OFF	ON
2	011	OFF	ON	ON
3	111	ON	ON	ON
0	000	OFF	OFF	OFF
1	...			

5. Switch sequence <=000-001-000-010-000-100-000=> (sequence 4)
This switching sequence switches on with the actuation of a communication object and then off again. Thereafter, other communication objects are switched on or off.

Switching sequence		**Value of the communication objects**		
No.	**Short des.**	**Switch 1**	**Switch 2**	**Switch 3**
0	000	OFF	OFF	OFF
1	001	OFF	OFF	ON
2	000	OFF	OFF	OFF
3	010	OFF	ON	OFF
4	000	OFF	OFF	OFF
5	100	ON	OFF	OFF
0	...			

Commissioning – Operating mode “Switching sequence”

How does the device know where it currently is in the sequence?

The object *Number of operation* counts the position in the sequence

Is it possible to control a switching sequence in parallel from several push buttons?

Yes, the object “Level increment/decrement” exists for this purpose.

Debounce time

Debouncing prevents unwanted multiple operations of the input, e.g. due to bouncing of the contact. The exact function of this parameter can be found at section 4.2.

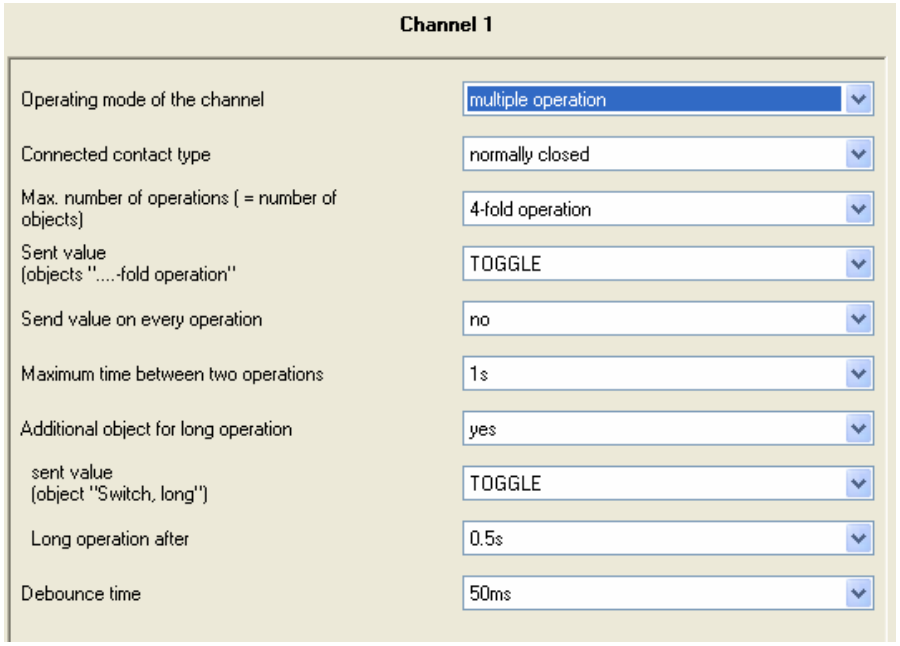
3.2.7.1 Communication objects “Switch sequence”

No.	Function	Object name	Data type	Flags
0	**Block**	**Channel 1, switching sequence**	**1 Bit EIS1 DPT 1.003**	**C, W**
0: Enable input 1: Block input Using the communication object *Block*, the function of the input circuitry can be blocked or enabled. A blocked input behaves as if there has been no change of the input signal. The input objects continue to be available. When a blocked input is enabled the input is scanned. A programmed reaction is undertaken with a change of the state compared to the state before the block. If the input is just being actuated as it is being enabled, the channel behaves as if the actuation has commenced at the end of the block. The actuation is undertaken if the input is blocked during actuation..				
1 **...** **4**	**Switch 1** **...** **Switch 4**	**Channel 1, switching sequence**	**1 Bit EIS1 DPT 1.001**	**C, W, T**
The number of these max. 4 objects is set in parameter *Number of values*. The objects represent the values within the switching sequence.				
5	**Number of operation**	**Channel 1, switching sequence**	**1 Byte**	**C, W, T**
This communication object includes the number of operation of the respective switching sequence. With synchronization of several binary inputs the respective communication object should be linked with the same group address. Note: Ensure that the number of communication objects is equal to the inputs to be synchronised (e.g. 3 stages).				
6	**Level increment/decrement**	**Channel 1, switching sequence**	**1 Bit EIS1 DPT 1.001**	**C, W**
When an ON telegram is received on this communication object, the input increments a stage and when an OFF telegram is received it decrements a stage. 0: Decrement level 1: Increment level				

3.2.8 Operating mode “Push button with multiple operation”

The operating mode *Push button with multiple operation* is described in the following.

This operating mode enables detection of multiple operations performed in quick succession and the operation of the switching actions which they trigger.



Connected contact type

Options: open / closed

Closed: Input is closed with actuation (normally open contact).
open: Input is opened with actuation (normally closed contact)

Max. number of operations (= number of objects)

Options: single operation
two-fold operation
three-fold operation
four-fold operation

Here the maximum number of operations is set. The number is equal to the number of communication objects *…fold operation*.

Note: If the actual number of operations is greater than the maximum value set here, the input reacts as if the number of operations is equal to the maximum value set here.

sent value

Options: ON / OFF / TOGGLE

Here the object value to be sent can be set here. The settings ON, OFF and TOGGLE are possible. The current object value is inverted using toggle.

Send value on every operation

Options: yes / no

If *yes* has been entered for this parameter, the respective object value is updated and sent after each operation with multiple operation.

Example: With three-fold operation, the objects *1-fold operation* (after 1st operation), *2-fold operation* (after 2nd operation) and *3-fold operation* (after 3rd operation) are sent.

Maximum time between two operations

Options: 0,2s / 0,3s / … / 0,8s / 1s / 1,2s / ... / 9s / 10s

The time that can elapse between two operations is set here.

If the device has detected an operation, it will wait for the time entered here. If there are no further operations within this period, counting stops and the object *x-fold operation* is sent. The device then counts again commencing at “1” with the next operation.

Additional object for long operation

Options: yes / no

A further function can be carried out with long operation of the input via the object *Switch (long)*. If a long operation is undertaken within the maximum time after one or more short operations, the short operations are ignored.

sent value

Options: ON / OFF / TOGGLE

Here you can set with a long operation of the object value *Switch (long)* if “ON“, “OFF“ or “TOGGLE“ is to be switched.

Long operation after

Options: 0,2s / 0,3s / 0,4s / 0,5s / ... / 9s / 10s

In this parameter you set the time period after which an actuation is considered a “long” operation.

Debounce time

Options: 20ms / 30ms / 50ms / 70ms / 100ms / 150ms / 200ms

Debouncing prevents unwanted multiple operations of the input, e.g. due to bouncing of the contact. A more detailed explanation of the function can be found in section 4.2.

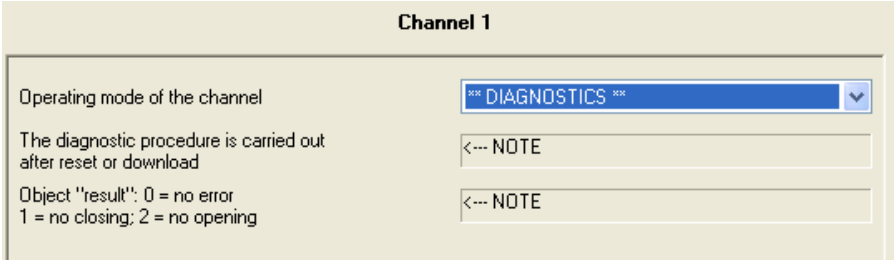
3.2.8.1 Communication objects “Multiple operation”

No.	Function	Object name	Data type	Flags
0	**Block**	**Channel 1, multiple operation**	**1 Bit EIS1 DPT 1.003**	**C, W**
0: Enable input 1: Block input Using the communication object *Block* the function of the input circuitry can be blocked or enabled. A blocked input behaves as if there has been no change of the input signal. The input objects continue to be available. When a blocked input is enabled the input is scanned. A programmed reaction is undertaken with a change of the state compared to the state before the block. If the input is just being actuated as it is being enabled, the channel behaves as if the actuation has commenced at the end of the block. The actuation is undertaken if the input is blocked during actuation..				
1 **...** **4**	**1-fold operation** **...** **4-fold operation**	**Channel 1, multiple operation**	**1 Bit EIS1 DPT 1.001**	**C, W, T**
The number of these max. 4 objects is set in parameter *Max. Number of operations*. After multiple operations of an input the respective object is sent to suit the number of operations. The telegram value can be set in the parameters.				
5	**Long operation**	**Channel 1, multiple operation**	**1 Bit EIS1 DPT 1.001**	**C, T**
This object is visible if the parameter *“Additional object for long operation”* has been set to the value “yes”. After a long operation has been detected the object is sent. The telegram value can be set in the parameters.				

3.2.9 “DIAGNOSTICS” mode

The operating mode *DIAGNOSTICS* is described in the following.

This operating mode enables the inspection of the end stage of the channel for a malfunction, e.g. which has occurred due to an overvoltage.



Proceed as follows for the diagnostics of a channel:

1. Set the parameters in the “Diagnostics” mode and assign the *Defective* object to a group address.
2. Remove the connections to the channel to be tested.
3. Reprogram the device.
4. Read out the object value *Defective* with the assistance of the ETS. If the object has the value “0” the end stage of the channel is ok. Otherwise the channel is defective and can no longer be used.

Communication object:

1	**Defective**	**Channel 1, diagnostics**	**1 Bit EIS1 DPT 1.001**	**C, W, T**
This channel contains the result of the diagnostics. 0: Channel is ok 1: Channel is defective				

3.3 Special operating states

3.3.1 Bus voltage failure

Reaction on bus voltage failure

The input channels do not function with a bus voltage failure.
The output channels remain frozen in their state as long as the auxiliary supply is present.

Reaction on bus voltage recovery

The reaction of the inputs and outputs can generally be programmed in the parameters. If the auxiliary voltage is not available, the reading of the inputs is delayed until the auxiliary supply is re-established. More detailed information can be found in section 3.2.

3.3.2 Auxiliary voltage failure

Reaction on auxiliary voltage failure

On a failure of the 12/24 V DC auxiliary supply the state of the inputs is frozen. The outputs switch off.

Reaction on bus voltage recovery

On recovery of the 12/24 V DC auxiliary supply the state of the inputs is scanned. If there is a change with respect to the frozen state, a reaction occurs in accordance with the setting of the parameters.
The objects are updated on the bus if required.

3.3.3 Programming

The device can be programmed with the EIB tool software ETS2 **V1.3** or higher. In order to reduce the programming time of the device by the ETS, it is delivered in a pre-programmed state. During programming it is automatically detected if the correct program is already in the device.

If the device is pre-programmed with another version – which should only be a very rare occurrence – an full download is completed automatically. This may take a few minutes.

After programming is complete the device behaves just as after a bus voltage recovery.

4 Special functions

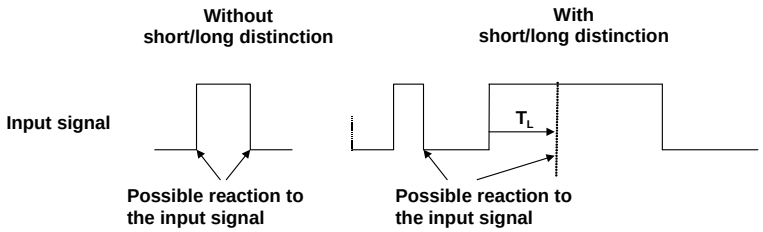
In the following, special functions are explained whose descriptions were not possible in conjunction with the parameters and objects for reasons of space.

4.1 Difference between short and long operation

This function is available in the operating modes *Switch sensor* and *Value / Scene / Forced operation*.

With every operation it must first of all be ascertained if a short or long operation has occurred here. Only thereafter will a possible reaction be triggered.

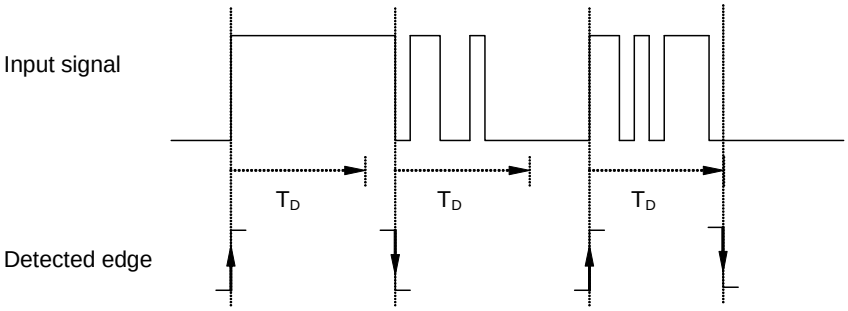
The following drawing shows the function in detail:



4.2 Debouncing the inputs

If an edge is detected at an input, the input will react immediately to this edge (e.g. by sending a telegram). Within the following debounce time signals on the input are ignored.

The following example clarifies this:



After detection of an edge on the input, further edges are ignored for the duration of the debounce time T_D.

4.3 Evaluation of a minimum signal duration

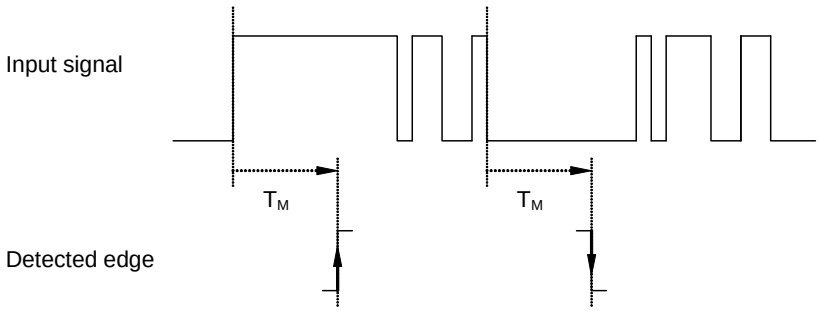
The minimum signal duration enables the delayed sending of telegrams.

If an edge is detected on the input, the minimum signal duration will start. No telegram is sent on the bus at this time. The signal on the input is observed within the minimum signal duration.
If a further edge appears at the input during the minimum signal duration, it will be interpreted as a new operation and the minimum signal duration restarts.

If the input signal remains stable for the minimum duration, the edge is valid and a telegram is sent on the bus if necessary.

The following example clarifies this: Even though several edges occur at the input, only two edges remain stable for the minimum signal duration T_M and are detected as valid.

If an opposite edge is detected before the minimum signal duration has completed, no telegram is sent on the bus.



However: Even when the minimum signal duration is active the debounce function continues to remain valid.

5 Appendix

5.1 Switching sequence “All options”

The switching sequence “All options” (sequence 2) undertakes all options in succession . Only one value changes between two stages and thus only one telegram is sent.

The following table describes the sequence when 4 objects are used:

Switching stage		**Value of the communication objects**			
No.	**Short des.**	**Switch 4**	**Switch 3**	**Switch 2**	**Switch 1**
0	0000	OFF	OFF	OFF	OFF
1	0001	OFF	OFF	OFF	ON
2	0011	OFF	OFF	ON	ON
3	0010	OFF	OFF	ON	OFF
4	0110	OFF	ON	ON	OFF
5	0111	OFF	ON	ON	ON
6	0101	OFF	ON	OFF	ON
7	0100	OFF	ON	OFF	OFF
8	1100	ON	ON	OFF	OFF
9	1101	ON	ON	OFF	ON
10	1111	ON	ON	ON	ON
11	1110	ON	ON	ON	OFF
12	1010	ON	OFF	ON	OFF
13	1011	ON	OFF	ON	ON
14	1001	ON	OFF	OFF	ON
15	1000	ON	OFF	OFF	OFF

5.2 Value table for object “8 Bit scene”

Object value		**Meaning**
Decimal	**Hexadecimal**	
00 *or* 64 01 *or* 65 02 *or* 66 ... 63 *or* 127	00h *or* 40h 01h *or* 41h 02h *or* 42h ... 3Fh *or* 7Fh	Recall scene 1 Recall scene 2 Recall scene 3 ... Recall scene 64
128 *or* 192 129 *or* 193 130 *or* 194 ... 191 *or* 255	80h *or* B0h 81h *or* B1h 82h *or* B2h ... AFh *or* FFh	Store scene 1 Store scene 2 Store scene 3 ... Store scene 64

5.3 Ordering details

Designation	Short description	Order No.	bbn 40 16779 EAN	Price 1 pc. [EURO]	Price group	Unit weight 1 pc. [kg]	Pack unit [pc.]
Universal I/O Concentrator, 32-Fold	UK/S 32.2	2CDG 110 071 R0011			26	0.15	1

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