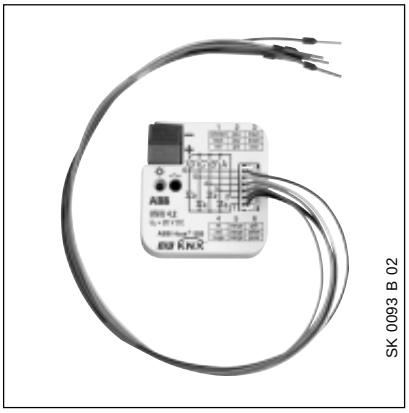
Universal Interface, 4-fold, FM
US/U 4.2, GH Q631 0070 R0111



The device has four channels which can either be parameterised as inputs or outputs by selecting the application in the ETS2 program.

Using the colour-coded connecting cables, it is possible to connect conventional push buttons, floating contacts or light-emitting diodes.

The scanning voltage for the contacts and the supply voltage for the LEDs are made available by the device.

Series resistors for external LEDs are integrated in the device.

The universal interface is inserted in a conventional 60 mm combined wall and joint box.

The bus connection is carried out via the bus connecting terminal supplied.

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Technical Data

Power supply	– EIB	24 V DC, via the bus line Power consumption < approx. 10 mA
Inputs/outputs	– Number	4, can be parameterised as inputs or outputs (depending on the application)
	– Permitted cable length	≤ 10 m
Input	– Scanning voltage	20 V DC
	– Input current	0.5 mA
Output	– Supply voltage	5 V DC
	– Output current	max. 2 mA, limited via 1.5 kΩ series resistor
	– Safety	short-circuit-proof, overload protection, reverse voltage protection
Operating and display elements	– Red LED and push button	for assigning the physical address
Connections	– Inputs/outputs	6 cables of approx. 30 cm in length can be extended to max. 10 m
	– EIB	Bus connecting terminal included with supply
Type of protection	– IP 20, EN 60 529 when installed	
Protection class	– III	
Ambient temperature range	– Operation	- 5 °C … 45 °C
	– Storage	- 25 °C … 55 °C
	– Transport	- 25 °C … 70 °C
Dimensions	– 39 x 40 x 12 mm (H x W x D)	
Weight	– 0.05 kg	
Certification	– EIB-certified	
CE norm	– in accordance with the EMC guideline and the low voltage guideline	

Application programs	Number of communication objects	Max. number of group addresses	Max. number of associations
Binary Input Display Heat 4f/1	29	254	254

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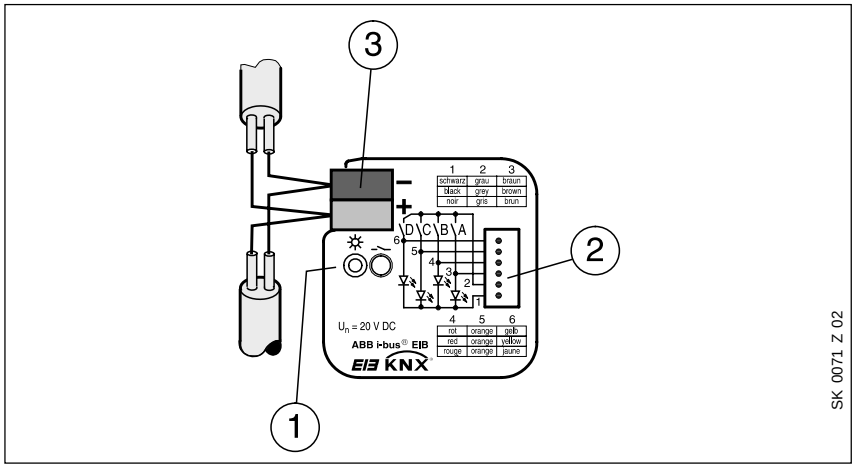
Circuit diagram



1 Programming LED/push button
2 Inputs/outputs
3 Bus terminal

Note

Please note that you can only program the universal interface using ETS2 from version 1.2 onwards.

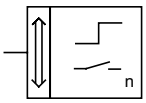
The grey wire forms a common reference potential for the connected push button or switch contacts.

The black wire forms a common reference potential for the LEDs.

Wires that are not required should be insulated.

Further detailed information about the installation, programming and application can be found in the "Product manual for US/U 2.2 and US/U 4.2".

Binary Input Display Heat 4f/1



Selection in ETS2

– ABB
  └In/Output
    └Binary/binary

The application program makes a separate set of parameters and communication objects available for each input. Further parameters or different communication objects are displayed depending on the parameter settings.

Bus voltage recovery

After bus voltage recovery, the interface does not start to send immediately but only once an adjustable delay has elapsed.

The initialisation period of 2 s is already included in the sending delay.

Limit telegram rate

On the general parameter page, it is possible to limit the number of telegrams that are sent over a specific time period. This factor should be noted primarily on bus voltage recovery when a large number of bus devices send their current status simultaneously.

Function of inputs/outputs

The parameter setting “Function of the channel” defines the operating mode of the input. The following functions can be selected:
– switch sensor,
– switch/dimming sensor,
– shutter sensor,
– value / forced operation,
– scene control,
– control of electronic relay (heating actuator),
– LED control,
– switching sequence (“latching relay”),
– push button with multiple operation
– or pulse counter.

Alternatively, it is possible to fully deactivate an input with the setting “no function”.

Disable

It is possible to disable an input via the 1 bit communication object. To do so, a telegram with the value “1” must be received. A telegram with the value “0” cancels the lock-out. The disable object is activated for all the input functions, except for the operation of an electronic relay and LED control.

Switch sensor

If the function of the input is set as a switch sensor, it is possible to connect conventional push buttons to the inputs of the universal interface. The ETS2 program makes at least one 1 bit communication object “Input ... - Telegr. switch” available for each switch sensor input.

If the setting “Distinction between long and short operation” is set to “yes”, the switch sensor can distinguish between a short and a long input signal. A further object “Input ... -long - Telegr. switch” can be activated via the parameter “Number of objects for short/long operation” so that it only reacts to long operations.

Both normally closed and normally open contacts can be connected to the respective input. If normally open contacts are used for example, the setting “Connected contact type” must be set to “normally open”.

The information that should be sent when the push button is pressed is defined separately for each switch object. Either an ON or OFF telegram can be triggered. Alternatively, no reaction can take place after a push button operation.

It is possible to specify the period which is interpreted as a long operation by the input. Intervals from 200 ms upwards can be set. The period comprises a base and a factor.

Period for long operation =
*Base * Factor*

An adjustable debounce time can be set to prevent a bounce at the contacts of conventional push buttons or switches from having a negative influence. The default setting of 50 ms should normally be sufficient for conventional push buttons.

If the switch sensor input should not distinguish between a short and long operation, the input sends telegrams to the object “Input ... - Telegr. switch” after an operation at the input.

In this case, the object value can be sent cyclically. It is possible to send either each object value cyclically on the bus (setting: “always”) or only specific object values (setting: “if ‘switch’ = ON” or “if ‘switch’ = OFF”).

The reaction at the closing and opening of the input contact can also be defined. For both cases, it is possible to set separately whether an ON, OFF or TOGGLE telegram is triggered. Alternatively, it is possible to stop the cyclical sending.

The cyclic interval required for cyclical sending is composed of a base and a factor.

*Cyclic sending interval=Base*Factor*

If only one object is activated, it can be sent after bus voltage recovery. However, the parameter “Transmit object value after bus voltage recovery” is deactivated by default.

If there is no distinction between a short and long operation, the contact bounce can either be removed via a debounce time or a minimum operating time. The default setting of 50 ms should also be sufficient in this case for standard push buttons and switches.

Switch/dimming sensor

If an input is parameterised as a switch/dimming sensor, the ETS2 program displays by default a 1 bit communication object “Input ...-short - Telegr. switch” and a 4 bit communication object “Input ... - Telegr. dimming”.

Both normally closed and normally open contacts are connected to the respective input. If normally open contacts are used for example, the setting “Connected contact type” must be set to “normally open”.

The 1 bit object “Input ...-short - Telegr. switch” can be masked via the parameter “Dimming functionality”. the 4 bit object is then only available for dimming.

This function is advisable e.g. if a series push button occupies two inputs of the universal interface. The left push button should only be able to switch on and the right push button should only be able to dim.

If both objects are displayed (setting: “Dimming and switching”), the type of telegram that is sent to the 1 bit object is defined via the parameter “Reaction on short operation”. The parameter “Reaction on long operation” defines which information should be sent to the 4 bit object after a long operation.

The period which is interpreted as a long operation by the input can be set between 0.3 s and 10 s.

It is possible to choose between two dimming modes for different applications. The default setting is “Start-stop dimming”. This means that the command to dim brighter by 100% is sent to the 4 bit object after a long operation. When the input signal is cancelled, the command to stop dimming is sent.

If “Dimming steps” is selected, the preset value “Brightness change on every sent telegram” is sent to the 4 bit object. This is repeated cyclically at an adjustable cyclic interval.

Step dimming is always used if dimming should be carried out via several line couplers in large installations. This ensures that all the affected dimming actuators can be dimmed exactly to the same brightness value. In the case of “Start-stop dimming”, a dimming telegram can be retained temporarily in the memory of a coupler because there is currently bus traffic on the main line. The dimming actuators on the secondary line can no longer display the same brightness value as on the main line.

The adjustable debounce time prevents the unwanted contact bounce of conventional push buttons or switches from having a negative effect.

Shutter sensor

When using the inputs of the universal interface as a shutter sensor, the respective inputs can be adapted exactly to the application. It is possible to select either a 1 push button operation, a 1 switch operation, a 2 push button operation or a 2 switch operation.

During operation as a shutter sensor, the ETS2 program displays two 1 bit communication objects: one for moving the shutter UP/DOWN and one for STOP/louvre adjustment.

The other two communication objects enable the shutter actuator to report the upper or lower limit position. If the shutter is in the upper limit position, the object “Upper limit position” has the value “1”. Otherwise the value of the object is “0”. If the shutter is in the lower limit position, the object “Lower limit position” has the value “1”. Otherwise the value is “0”.

The limit position objects are particularly necessary in single push button mode. A push button operation normally triggers either a movement or louvre adjustment command in the opposite direction. However, if the shutter is located in the upper limit position, it is not able to move its louvres upwards.

In single push button mode, the shutter sensor normally distinguishes between a short and a long operation.

Both normally open and normally closed contacts can be connected to the respective input. If normally open contacts are used for example, the setting “Connected contact type” is set to “normally open”.

The period which is interpreted as a long operation by the input can be set between 0.3 s and 10 s.

The adjustable debounce time prevents the unwanted contact bounce of conventional push buttons or switches from having a negative effect.

If a long operation should trigger a movement command, the operating functionality “1 push button, short = stepping, long = moving” must be selected. The louvre adjustment is then always carried out in the opposite direction to the last movement of the blind.

If a short operation should trigger a movement command, the operating functionality “1 push button, short = moving, long = stepping” must be selected. A long operation in this case triggers louvre adjustment telegrams. These are sent cyclically.

If a blind should be moved in 1 push button or 1 switch operation mode, there is no distinction between a short and a long operation. The movement command in this case is applied for the duration of the input signal.

All the 2 push button or 2 switch operation modes enable two inputs of the universal interface to be used as shutter inputs. In the setting “2 push button, standard”, a stop or louvre adjustment telegram is triggered after a short operation while a long operation triggers a movement command.

The setting “Reaction on short/long operation” defines whether the shutter should be raised or lowered or the louvres should be opened or closed.

In the operating functions “2 switch operation, moving (shutter)” and “2 push button, moving (shutter)“, there is no distinction between a short and a long operation. A movement command is triggered automatically after each operation and the shutter or blind is stopped at the end of the operation.

In the setting “2 push button, stepping”, a louvre adjustment telegram is sent after each operation. The parameter “Reaction on operation” defines whether a “STOP / Lamella UP” or a “STOP / Lamella DOWN” telegram should be sent.

The louvre adjustment telegram is repeated cyclically for the duration of the input signal. The cyclic interval is specified with the parameter “‘Telegr. STOP/ lamella adj.’ is repeated every”. Intervals between 0.3 s and 10 s can be set.

Value / Forced position

When used as a value or forced position sensor, a 1 bit, a 2 bit, a 1 byte, a 2 byte or a 4 byte communication object is available for the relevant channel, depending on the setting.

If the parameter “Distinction between long and short operation” has been set to “yes”, the ETS2 program displays a further communication object for the respective input. Each communication object has its own set of parameters i.e. a 1 byte object can be selected for the first object “Value ...” while a 2 byte object can be chosen for the second “Value ...” object.

The object type that is assigned to the respective communication object is specified with the parameter “Reaction on ... operation”. Alternatively, the setting “no reaction” can be selected.

The setting “2 bit value (forced position)” makes it possible to address actuators that have a positive drive function in accordance with EIS 8. The forced positioning can be activated (ON or OFF) or deactivated.

In the setting “1 byte value”, values between “0” and “255” can be sent.

If a “2 byte value” is used, it can have the following three functions: values between -32.768 and +32.767, values between 0 and 65.535 or floating point values. Floating point values can be sent between -100.00 and +100.00. They can be received e.g. by EIB room thermostats and thus implement a temporary setpoint adjustment.

The adjustable debounce time prevents the unwanted contact bounce of conventional push buttons or switches from having a negative effect.

If there is no distinction between a short and long operation, the contact bounce can either be removed via a debounce time or a minimum operating time. The default setting of 50 ms should also be sufficient in this case for standard push buttons and switches.

Scene control

The inputs of the universal interface can also be used to recall or store a scene (e.g. a lighting scenario).

Both normally closed and normally open contacts are connected to the respective input. If normally open contacts are used for example, the setting “Connected contact type” must be set to “normally open”.

Depending on the application, it is possible to implement scene control either via “5 separate objects” or via an “8 bit scene”.

When implementing scene control via an “8 bit scene”, the scene number which should be recalled can be set with the parameter “No. of scene (0...63)”. The ETS2 program displays two communication objects in this case: a 1 byte object “Input ... - 8 bit scene” for sending the scene number to an appropriate scene module and a 1 bit object “Input ... - Store scene”. The storing of the current scene can be triggered via this object - if it has been defined in the parameters - by the receipt of the values “0” and “1” in succession. A “1” is sent via this object when a scene is stored. It is thus possible e.g. to switch on a confirmation LED.

The input can differentiate between a short operation signal and a long signal. A short operation can recall a scene while a long operation can store a scene.

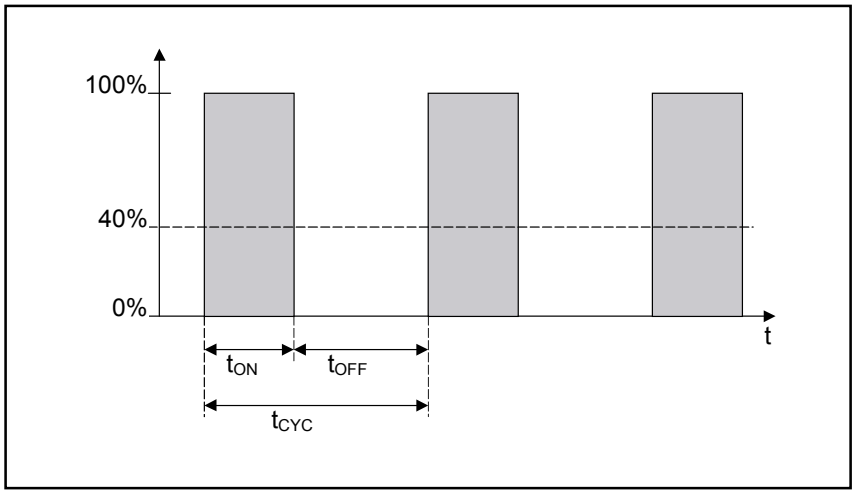
The period which is interpreted as a long operation by the input can be set between 0.3 s and 10 s.

The adjustable debounce time prevents the unwanted contact bounce of conventional push buttons or switches from having a negative effect.

If the implementation of the scene control is carried out via “5 separate objects”, the “8 bit scene” object is no longer displayed and 5 further 1 bit or 1 byte communication objects “Telegr. switch actuator group …” are shown. Switch and/or dimming actuators can be addressed via these 5 objects.

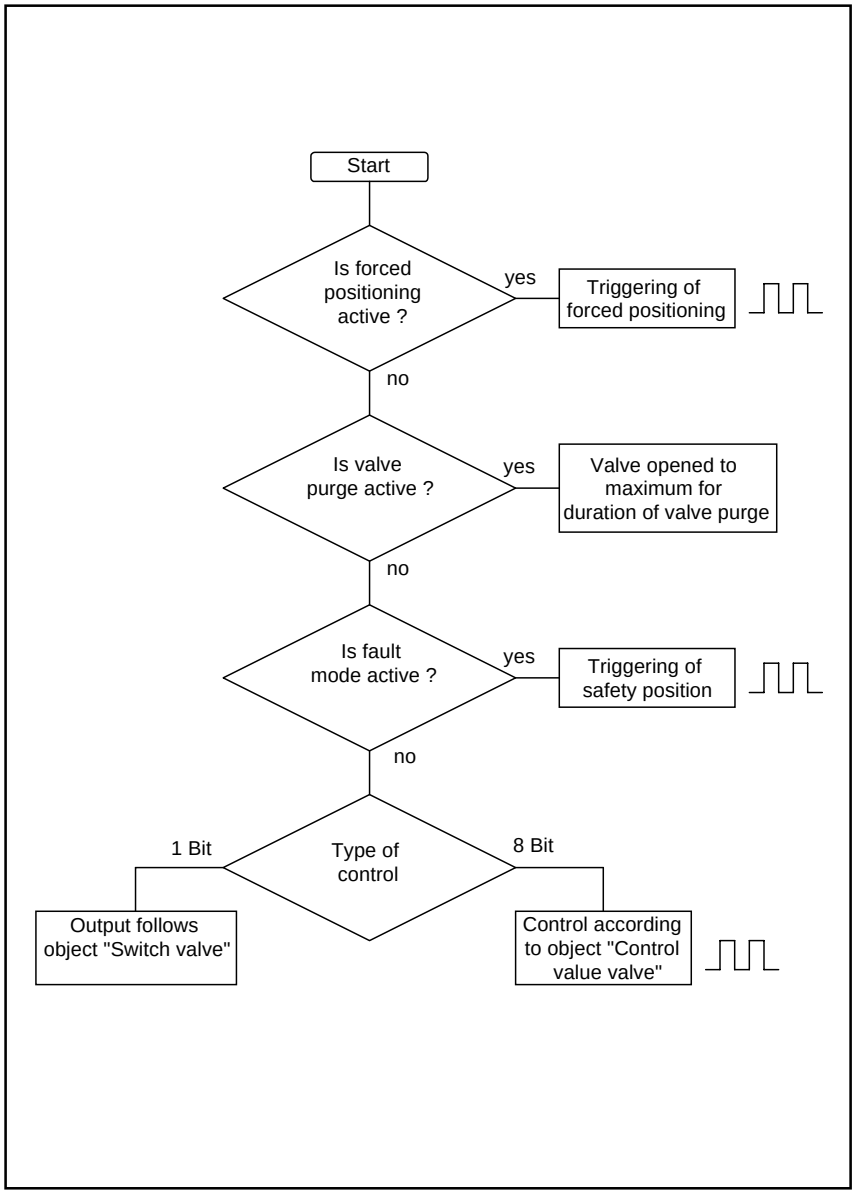
Top right graphic:
Control of electronic relay (heating actuator)

The valve is triggered with OPEN during the period t_{ON} and triggered with CLOSE during the period t_{OFF}.
Since t_{ON} = 0.4 x t_{CYC}, the valve is calibrated with an opening of approx. 40%.
t_{CYC} is the so-called PWM cyclic time for continuous control.



Bottom right graphic:
Control of electronic relay (heating actuator)

The actuator can trigger a specific valve position during “Forced positioning”, “Valve purge” as well as a safety position. The following diagram gives an overview:



The ETS2 program makes an additional parameter available on a separate tab for each actuator group. The object type (1 bit or 1 byte) is defined with the parameter “Control of actuator group ... via”. When controlled via a 1 bit object, the preset value can be “ON” or “OFF”. In the case of a 1 byte object, values between “0” and 255” can be entered.

Control of electronic relay (heating actuator)

If the universal interface is used to operate an electronic relay for heating control, the ETS2 program can display up to 5 communication objects for the respective input.

The control is generally carried out via a room thermostat. Depending on whether the room thermostat sends a continuous (1 byte) or switching control value, the respective input can be adapted accordingly. The parameter “Control telegram is received as” is used for this purpose. The ETS2 program makes a 1 bit object “Switch” (setting: “1 bit (PWM or on-off control)”) or a 1 byte object “Control value (PWM)” (setting: “1 byte (continuous)”) available.

When using the 1 bit object, the interface follows the signal of the “Switch” object. When implementing the control value via the 1 byte object, the electronic relay switches the electrothermal heating actuator via pulse width modulation. This means e.g. if the control value is 70%, that the valve opens for 7 min. and closes for
3 min. over a period of 10 min. (See also the graphic on the previous page for controlling an electronic relay).

The current switching state of the respective channel is sent via the object “Telegr. status/ackn.”. A telegram with the value “0” means that the valve has been closed while a telegram with the value “1” means that the valve has been opened.

Note:
With PWM continuous control, this object is sent after each change at the output. The additional telegram should be taken into account, particularly when there is a short PWM cyclic period.

The control mode can be adapted to the various valve types. The following options can be set: “normally closed” or “normally open”.

The parameter “PWM cycle time for continuous control” defines the total period for monitoring the control value. (See also top right graphic).

A further 1 bit communication object “Valve purge” can be activated via the parameter “Enable object “Telegr. valve purge”. The connected valve can be opened via this object without dependence on the input state. The central object “Telegr. trigger valve purge” which is able to send cyclically on the bus can be used for control.

The “Position of the valve drive on bus voltage recovery” can be adjusted. A setting between 0% (closed) and 100% (open) can be selected in 10% steps.

If the setting “Enable monitoring of the controller, fault message, forced positioning” is set to “yes”, the ETS2 program displays a further tab for selecting the monitoring function, the fault signal and forced positioning.

If the monitoring of the controller is enabled, the universal interface expects a control value to be sent. If no control values are received within a certain monitoring period, the interface develops a fault. This means that the “Position of the valve drive on failure of the control” adopts the preset value.

The “Cyclic monitoring time of room thermostat” can be set. It is composed of a base and a factor.
*Monitoring time = Base * Factor*

If a failure of the room thermostat has been established and the valve is in the fault position, a telegram is sent via the 1 bit object “Telegr. fault”. To do so, the fault object must previously be activated via the parameter “Enable object ‘Telegr. fault’”.

The valve can be moved to a preset position via the 1 bit communication object “Forced positioning”. Forced positioning or the regular valve purge are used during the summer months, so that deposits cannot build up on the valves. The “Valve position during forced positioning” can be set between 0% (closed) and 100% (opened).

Please take the order of priority for forced positioning, valve purge, fault operation and normal control from the second graphic in the bottom right-hand corner.

LED control

When using the universal interface for controlling LEDs, a maximum of three 1 bit communication objects are available for each channel. The object “Output ... - LED switching” is used by default to switch on the connected LED. A telegram with the value “1” normally switches the LED on while a telegram with the value “0” switches it off again. The behaviour can be inverted with the parameter “LED is switched ON, if ...”.

With a further object “Output ... - LED permanent ON”, the LED can be switched on independently of the object “LED, switching”. This means that as soon as the object “LED permanent ON” has the value “1”, the LED is switched on, regardless of the value of the object “LED, switching”.

If the LED functionality is modified from “switch ON/OFF” to “Flashing”, the communication object “Output ... - LED, switching” is replaced by the 1 bit object “Output ... - LED, flashing”. The setting in the parameter “LED flashes, if ...” determines whether a connected LED starts to flash with an ON or an OFF telegram.

It is possible to select the period that the LED is switched ON or OFF for when it flashes. Both periods can be set separately between 100 ms and 60 ms.

It is possible to define a maximum operating time. To do so, the time limit must be enabled with the parameter “Time limit of LED control”. If “yes” is selected, the connected LED only remains switched on after an ON command for the duration of the time limit. This limit is preset with a base and a factor.

Time limit = Base * Factor

The current status of the LED is sent via the object “Telegr. status/ackn.”. The object is however only activated if the parameter “Transmit status via object ‘Telgr. status/ackn.’” has been set to “yes”.

Switching sequence (“latching relay”)

The use of the universal interface as a stepping switch (“latching relay”) enables the flexible switching on or off of up to five 1 bit communication objects via a single input.

Both normally closed and normally open contacts are connected to the respective input. If normally open contacts are used for example, the setting “Connected contact type” must be set to “normally open”.

The parameter “Number of objects” determines the number of objects. That means e.g. if “3 levels” are selected, the ETS2 program displays three 1 bit objects “Input ... - Value ...” for the respective input.

Three different switching sequences can be set. If “sequentially on/off (one push button)” is set, the states of the objects are modified according to the following switching sequence (example with 3 levels):

…>000>001>011>111>011>001>…

If “on/off (several push buttons)” is selected, the states of the objects only change in one direction when the push button is pressed. It is possible to switch upwards (increment) or switch downwards (decrement). For this reason, at least two inputs are required for these switching sequences: one for the following switching sequences (example with 3 levels):

000>001>011>111

and the other switch sensor for the reverse switching sequences (example with 3 levels):

111>011>001>000

If “All combinations” is selected, the states of the objects are modified according to the following switching sequences (example with 3 levels):
…>000>001>011>010>110>111>101>100>…
It is thus guaranteed that the value of only one communication object is changed between two switching levels.

The setting “Function on operation” (only activated for several push buttons) defines whether an input signal switches one level upwards or one level downwards.

The adjustable debounce time prevents the unwanted contact bounce of conventional push buttons or switches from having a negative effect.
With the additional 1 bit communicaiton object “Level increment/decrement”, it is possible to switch upwards or downwards via EIB telegrams. An ON telegram switches down one level while an OFF telegram switches up one level.

Push button with multiple operation

When used as a “Push button with multiple operation”, the universal interface can detect multiple operations at the respective input. These multiple operations are sent to a maximum of four 1 bit communication objects.

Both normally closed and normally open contacts are connected to the respective input. If normally open contacts are used for example, the setting “Connected contact type” must be set to “normally open”.

The ETS2 program makes a large number of objects available depending on the “Max. number of operations”. This means that if e.g. a “single operation“ and a “2-fold operation” should be evaluated, the setting “2-fold operation” should be selected. The ETS2 program displays two objects “Input ... - Telegr. operation ...-fold”.

The setting “Transmitted value (object ‘Telegr. operation ...-fold’)” determines which value is sent after an operation (single, 2-fold, 3-fold or 4-fold). The transmitted value can be an ON, OFF or TOGGLE telegram.

The parameter “Transmit value on every operation” defines whether the interface evaluates the respective operations completely or confirms them individually.

Example:
The “Max. number of operations” has been defined as “3-fold operation”. The parameter “Transmit value on every operation” is set to “no”. In this setting, the interface sends a telegram to the object “Telegr. operation 1-fold” when a single operation has been detected. After a 2-fold operation, a telegram is sent to the object “Telegr. operation 2-fold” while a telegram is sent to the corresponding object after a 3-fold operation.
If the parameter “Transmit value on every operation” is changed to “yes”, the interface can send a telegram after each operation. This means that a telegram is triggered after a three-fold operation to the objects “Telegr. operation 1-fold”, “Telegr. operation 2-fold” and “Telegr. operation 3-fold”.

The “Maximum time between two operations” indicates how long the interval (period) can be between multiple operations so that it can still be considered a multiple operation.

It is possible to activate an additional 1 bit object “Telegr. operation long” for the evaluation of a long push button action. The period which is interpreted as a long operation by the input can be set between 0.3 s and 10 s. The transmitted value on detection of a long push button action can be an ON, OFF or TOGGLE telegram.

The adjustable debounce time prevents the unwanted contact bounce of conventional push buttons or switches from having a negative effect.

Pulse counter

When used as a pulse counter, the universal interface can count up input signals and send them on the EIB. Depending on the parameter setting, up to four communication objects are displayed.

The parameter “Pulse detection on” determines whether input signals with a falling edge (normally closed contact) or a rising edge (normally open contact) are counted.

The interface can send the counter values in three sizes: as 8 bit values (0 … 255), 16 bit values (-32.768 … +32.767 or 0 …65.535) or as 32 bit values (-2.147.483.648 … +2.147.483.647). Depending on the size of the bit value, the ETS2 program displays an 8 bit, a 16 bit or a 32 bit communication object “Input ... - Telegr. counter value ... bytes”. The new counter value is sent to this object after each operation at the input.

The initial counter values can be parameterised. All counter values start with the value “0” by default.

The current counter value can be requested at any time via the EIB with the 1 bit object “Request counter values”. To do so, a telegram with the value “1” must be received. The objects “Input ... - Telegr. counter value ... bytes” and an enabled object “Input ... - Differential counter ... bytes” thus send their current values, regardless of whether these values have already been sent.

The adjustable debounce time prevents the unwanted contact bounce of conventional push buttons or switches from having a negative effect.

After a bus voltage failure, the current counter value can be sent directly on the bus. To do so, the parameter “Transmit counter values after bus voltage recovery” must be set accordingly. After bus voltage failure, the counter values are reset to their initial values.

A further tab is activated in the ETS2 program via the setting “Enable additional options”. Special functions can be set here when the interface is used as a pulse counter.
By default, the pulse counter records every operation at its input. With the parameter “Divider: number of input pulses for one counter step”, the counting function can be adapted to individual requirements.

The setting “Factor: one counter step changes counter value by” indicates how many steps are counted upwards on detection of a pulse. If a negative value is entered, the counter counts backwards.

If the counter values should be sent cyclically, the corresponding parameter should be set to “yes”. The cyclic time is composed of a base and a factor.
*Cyclic time = Base * Factor*

If the differential counter is activated, the ETS2 indicates three further communication objects. The object “Input ... - Differential counter ... bytes” always has the same bit width as the counter value object. The two objects “Input ... - Differential counter overflow” and “Input ... - Reset differential counter” are 1 bit objects.

The differential counter has the same counting function as the absolute counter. In contrast however, it can be reset via the object “Input ... - Reset differential counter”. In addition, a counter overflow can be reported on the bus via the object “Input ... - Differential counter overflow”. It is thus possible e.g. to measure daily consumption values via the differential counter.

The overflow value of the differential counter can be set. If the differential counter reaches the set value, a “1” is sent to the object “Input ... - Differential counter overflow” and the differential counter starts to count from the beginning.

Communication objects
when used as a switch sensor

No.	Type	Object name	Function
0	1 bit	Input A	Disable
1	1 bit	Input A	Telegr. switch
7	1 bit	Input B	Disable
8	1 bit	Input B	Telegr. switch
14	1 bit	Input C	Disable
15	1 bit	Input C	Telegr. switch
21	1 bit	Input D	Disable
22	1 bit	Input D	Telegr. switch

4

Communication objects
when used as a switch sensor with detection of long switch operations

No.	Type	Object name	Function
…			
2	1 bit	Input A - long	Telegr. switch
…			
9	1 bit	Input B - long	Telegr. switch
…			
16	1 bit	Input C - long	Telegr. switch
…			
23	1 bit	Input D - long	Telegr. switch

Communication objects
when used as a switch/dimming sensor

No.	Type	Object name	Function
0	1 bit	Input A	Disable
1	1 bit	Input A -short	Telegr. switch
2	4 bit	Input A	Telegr. dimming
7	1 bit	Input B	Disable
8	1 bit	Input B -short	Telegr. switch
9	4 bit	Input B	Telegr. dimming
14	1 bit	Input C	Disable
15	1 bit	Input C -short	Telegr. switch
16	4 bit	Input C	Telegr. dimming
21	1 bit	Input D	Disable
22	1 bit	Input D -short	Telegr. switch
23	4 bit	Input D	Telegr. dimming

Communication objects
when used only as a dimming sensor

No.	Type	Object name	Function
0	1 bit	Input A	Disable
2	4 bit	Input A	Telegr. dimming
7	1 bit	Input B	Disable
9	4 bit	Input B	Telegr. dimming
14	1 bit	Input C	Disable
16	4 bit	Input C	Telegr. dimming
21	1 bit	Input D	Disable
23	4 bit	Input D	Telegr. dimming

Communication objects
when used as a shutter sensor

No.	Type	Object name	Function
0	1 bit	Input A	Disable
1	1 bit	Input A	Telegr. shutter UP/DOWN
2	1 bit	Input A	Telegr. STOP / lamella adj.
3	1 bit	Input A	Upper limit position
4	1 bit	Input A	Lower limit position
7	1 bit	Input B	Disable
8	1 bit	Input B	Telegr. shutter UP/DOWN
9	1 bit	Input B	Telegr. STOP / lamella adj.
10	1 bit	Input B	Upper limit position
11	1 bit	Input B	Lower limit position
14	1 bit	Input C	Disable
15	1 bit	Input C	Telegr. shutter UP/DOWN
16	1 bit	Input C	Telegr. STOP / lamella adj.
17	1 bit	Input C	Upper limit position
18	1 bit	Input C	Lower limit position
21	1 bit	Input D	Disable
22	1 bit	Input D	Telegr. shutter UP/DOWN
23	1 bit	Input D	Telegr. STOP / lamella adj.
24	1 bit	Input D	Upper limit position
25	1 bit	Input D	Lower limit position

Communication objects
when using the channels for sending values (1 byte)

No.	Type	Object name	Function
0	1 bit	Input A	Disable
1	1 byte	Input A	Telegr. value (0… 255)
7	1 bit	Input B	Disable
8	1 byte	Input B	Telegr. value (0… 255)
14	1 bit	Input C	Disable
15	1 byte	Input C	Telegr. value (0… 255)
21	1 bit	Input D	Disable
22	1 byte	Input D	Telegr. value (0… 255)

Communication objects
when using the channels for forced operation

No.	Type	Object name	Function
…			
1	2 bit	Input A	Telegr. value (forced position)
…			
1	2 bit	Input B	Telegr. value (forced position)
…			
1	2 bit	Input C	Telegr. value (forced position)
…			
1	2 bit	Input D	Telegr. value (forced position)

Communication objects
when using the channels for sending values (2 byte)

No.	Type	Object name	Function
…			
1	2 byte	Input A	Telegr. value (-32768…32767)
…			
1	2 byte	Input B	Telegr. value (-32768…32767)
…			
1	2 byte	Input C	Telegr. value (-32768…32767)
…			
1	2 byte	Input D	Telegr. value (-32768…32767)

Communication objects
when using the channels for sending values (2 byte)

No.	Type	Object name	Function
…			
1	2 byte	Input A	Telegr. value (0…65535)
…			
1	2 byte	Input B	Telegr. value (0…65535)
…			
1	2 byte	Input C	Telegr. value (0…65535)
…			
1	2 byte	Input D	Telegr. value (0…65535)

4

Communication objects
when using the channels for sending values (floating point)

No.	Type	Object name	Function
…			
1	2 byte	Input A	Telegr. value (temperature)
…			
1	2 byte	Input B	Telegr. value (temperature)
…			
1	2 byte	Input C	Telegr. value (temperature)
…			
1	2 byte	Input D	Telegr. value (temperature)

Communication objects
when using the channels for sending values (4 byte)

No.	Type	Object name	Function
…			
1	4 byte	Input A	Telegr. value (0…4294967295)
…			
1	4 byte	Input B	Telegr. value (0…4294967295)
…			
1	4 byte	Input C	Telegr. value (0…4294967295)
…			
1	4 byte	Input D	Telegr. value (0…4294967295)

Communication objects
when using the channels for sending values with detection of long switch operations

No.	Type	Object name	Function
…			
1	1 byte	Input A -short	Telegr. value (0.1)
2	1 byte	Input A -long	Telegr. value (0…255)
…			
7	1 byte	Input B -short	Telegr. value (forced position)
8	1 byte	Input B -long	Telegr. value (-32768…32767)
…			
14	1 byte	Input C -short	Telegr. value (0…65535)
15	1 byte	Input C -long	Telegr. value (temperature)
…			
16	1 byte	Input D -short	Telegr. value (0…4294967295)
17	1 byte	Input D -long	Telegr. value (0…255)

Communication objects
when used for scene control (actuator groups)

No.	Type	Object name	Function
0	1 bit	Input A	Disable
1	1 bit	Input A	Telegr. switch actuator group A
2	1 bit	Input A	Telegr. switch actuator group B
3	1 bit	Input A	Telegr. switch actuator group C
4	1 bit	Input A	Telegr. switch actuator group D
5	1 bit	Input A	Telegr. switch actuator group E
6	1 bit	Input A	Store scene
7	1 bit	Input B	Disable
8	1 bit	Input B	Telegr. switch actuator group A
9	1 bit	Input B	Telegr. switch actuator group B
10	1 bit	Input B	Telegr. switch actuator group C
11	1 bit	Input B	Telegr. switch actuator group D
12	1 bit	Input B	Telegr. switch actuator group E
13	1 bit	Input B	Store scene
14	1 bit	Input C	Disable
15	1 bit	Input C	Telegr. switch actuator group A
16	1 bit	Input C	Telegr. switch actuator group B
17	1 bit	Input C	Telegr. switch actuator group C
18	1 bit	Input C	Telegr. switch actuator group D
19	1 bit	Input C	Telegr. switch actuator group E
20	1 bit	Input C	Store scene
21	1 bit	Input D	Disable
22	1 bit	Input D	Telegr. switch actuator group A
23	1 bit	Input D	Telegr. switch actuator group B
24	1 bit	Input D	Telegr. switch actuator group C
25	1 bit	Input D	Telegr. switch actuator group D
26	1 bit	Input D	Telegr. switch actuator group E
27	1 bit	Input D	Store scene

Communication objects
when used for scene control (8 bit scene)

No.	Type	Object name	Function
…			
1	1 byte	Input A	Telegr. switch actuator group A
2	1 byte	Input A	Telegr. switch actuator group B
3	1 byte	Input A	Telegr. switch actuator group C
4	1 byte	Input A	Telegr. switch actuator group D
5	1 byte	Input A	Telegr. switch actuator group E
…			

Communication objects
when used for scene control (8 bit scene) with stored function

No.	Type	Object name	Function
0	1 bit	Input A	Disable
1	1 byte	Input A	8 bit scene
6	1 bit	Input A	Store scene
7	1 bit	Input B	Disable
8	1 byte	Input B	8 bit scene
13	1 bit	Input B	Store scene
14	1 bit	Input C	Disable
15	1 byte	Input C	8 bit scene
20	1 bit	Input C	Store scene
21	1 bit	Input D	Disable
22	1 byte	Input D	8 bit scene
27	1 bit	Input D	Store scene

Communcation objects
when used for controlling an electronic relay (1 bit)

No.	Type	Object name	Function
1	1 bit	Output A	Switch
5	1 bit	Output A	Telegr. status/ackn.
8	1 bit	Output B	Switch
12	1 bit	Output B	Telegr. status/ackn.
15	1 bit	Output C	Switch
19	1 bit	Output C	Telegr. status/ackn.
22	1 bit	Output D	Switch
26	1 bit	Output D	Telegr. status/ackn.

4

Communication objects
when used for controlling an electronic relay (1 byte)

No.	Type	Object name	Function
1	1 byte	Output A	Control value (PWM)
5	1 bit	Output A	Telegr. status/ackn.
8	1 byte	Output B	Control value (PWM)
12	1 bit	Output B	Telegr. status/ackn.
15	1 byte	Output C	Control value (PWM)
19	1 bit	Output C	Telegr. status/ackn.
22	1 byte	Output D	Control value (PWM)
26	1 bit	Output D	Telegr. status/ackn.

Communication objects
when used for controlling an electronic relay with valve purging and forced positioning

No.	Type	Object name	Function
…			
3	1 bit	Output A	Valve purge
4	1 bit	Output A	Forced positioning
…			
6	1 bit	Output A	Telegr. fault
…			
3	1 bit	Output B	Valve purge
4	1 bit	Output B	Forced positioning
…			
6	1 bit	Output B	Telegr. fault
…			
3	1 bit	Output C	Valve purge
4	1 bit	Output C	Forced positioning
…			
6	1 bit	Output C	Telegr. fault
…			
3	1 bit	Output D	Valve purge
4	1 bit	Output D	Forced positioning
…			
6	1 bit	Output D	Telegr. fault
…			
29	1 bit	Output telegram	Telegr. trigger valve purge

Communication objects
when used for controlling LEDs (switching)

No.	Type	Object name	Function
1	1 bit	Output A	LED, switching
3	1 bit	Output A	LED permanent ON
8	1 bit	Output B	LED, switching
10	1 bit	Output B	LED permanent ON
15	1 bit	Output C	LED, switching
17	1 bit	Output C	LED permanent ON
22	1 bit	Output D	LED, switching
24	1 bit	Output D	LED permanent ON

Communication objects
when used for controlling an LED with status acknowledgement

No.	Type	Object name	Function
…			
4	1 bit	Output A	Telegr. status/ackn.
…			
11	1 bit	Output B	Telegr. status/ackn.
…			
18	1 bit	Output C	Telegr. status/ackn.
…			
25	1 bit	Output D	Telegr. status/ackn.

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Communication objects
when used for controlling an LED (flashing)

No.	Type	Object name	Function
1	1 bit	Output A	LED, flashing
…			
1	1 bit	Output B	LED, flashing
…			
1	1 bit	Output C	LED, flashing
…			
1	1 bit	Output D	LED, flashing
…			

Communication objects
when used as an input for switching sequences (“latching relay”) (3 levels)

No.	Type	Object name	Function
0	1 bit	Input A	Disable
1	1 bit	Input A	Value 1
2	1 bit	Input A	Value 2
3	1 bit	Input A	Value 3
6	1 bit	Input A	Level increment/decrement
7	1 bit	Input B	Disable
8	1 bit	Input B	Value 1
9	1 bit	Input B	Value 2
10	1 bit	Input B	Value 3
13	1 bit	Input B	Level increment/decrement
14	1 bit	Input C	Disable
15	1 bit	Input C	Value 1
16	1 bit	Input C	Value 2
17	1 bit	Input C	Value 3
20	1 bit	Input C	Level increment/decrement
21	1 bit	Input D	Disable
22	1 bit	Input D	Value 1
23	1 bit	Input D	Value 2
24	1 bit	Input D	Value 3
27	1 bit	Input D	Level increment/decrement

Communication objects
when used for switching sequences (“latching relay”) (5 levels)

No.	Type	Object name	Function
…			
4	1 bit	Input A	Value 4
5	1 bit	Input A	Value 5
…			
11	1 bit	Input B	Value 4
12	1 bit	Input B	Value 5
…			
18	1 bit	Input C	Value 4
19	1 bit	Input C	Value 5
…			
25	1 bit	Input D	Value 4
26	1 bit	Input D	Value 5

Communication objects
when used as a push button with multiple operations (3-fold)

No.	Type	Object name	Function
0	1 bit	Input A	Disable
1	1 bit	Input A	Telegr. operation 1-fold
2	1 bit	Input A	Telegr. operation 2-fold
3	1 bit	Input A	Telegr. operation 3-fold
7	1 bit	Input B	Disable
8	1 bit	Input B	Telegr. operation 1-fold
9	1 bit	Input B	Telegr. operation 2-fold
10	1 bit	Input B	Telegr. operation 3-fold
14	1 bit	Input C	Disable
15	1 bit	Input C	Telegr. operation 1-fold
16	1 bit	Input C	Telegr. operation 2-fold
17	1 bit	Input C	Telegr. operation 3-fold
21	1 bit	Input D	Disable
22	1 bit	Input D	Telegr. operation 1-fold
23	1 bit	Input D	Telegr. operation 2-fold
24	1 bit	Input D	Telegr. operation 3-fold

Communication objects
when used as a push button with multiple operations (4-fold) and detection of long switch operations

No.	Type	Object name	Function
…			
4	1 bit	Input A	Telegr. operation 4-fold
6	1 bit	Input A	Telegr. operation long
…			
11	1 bit	Input B	Telegr. operation 4-fold
13	1 bit	Input B	Telegr. operation long
…			
18	1 bit	Input C	Telegr. operation 4-fold
20	1 bit	Input C	Telegr. operation long
…			
25	1 bit	Input D	Telegr. operation 4-fold
27	1 bit	Input D	Telegr. operation long

Communication objects
when used as a pulse counter (4 byte)

No.	Type	Object name	Function
0	1 bit	Input A	Disable
1	4 byte	Input A	Telegr. counter value 4 bytes
3	1 bit	Input A	Request counter values
7	1 bit	Input B	Disable
8	4 byte	Input B	Telegr. counter value 4 bytes
10	1 bit	Input B	Request counter values
14	1 bit	Input C	Disable
15	4 byte	Input C	Telegr. counter value 4 bytes
17	1 bit	Input C	Request counter values
21	1 bit	Input D	Disable
22	4 byte	Input D	Telegr. counter value 4 bytes
24	1 bit	Input D	Request counter values

Communication objects
when used as a pulse counter (4 byte)
with overflow and reset function

No.	Type	Object name	Function
…			
2	4 byte	Input A	Differential counter 4 bytes
…			
4	1 bit	Input A	Differential counter overflow
5	1 bit	Input A	Reset differential counter
…			
9	4 byte	Input B	Differential counter 4 bytes
…			
11	1 bit	Input B	Differential counter overflow
12	1 bit	Input B	Reset differential counter
…			
16	4 byte	Input C	Differential counter 4 bytes
…			
18	1 bit	Input C	Differential counter overflow
19	1 bit	Input C	Reset differential counter
…			
23	4 byte	Input D	Differential counter 4 bytes
…			
25	1 bit	Input D	Differential counter overflow
26	1 bit	Input D	Reset differential counter

Communication objects
when used as a pulse counter (2 byte)

No.	Type	Object name	Function
…			
1	2 byte	Input A	Telegr. counter value 2 bytes
2	2 byte	Input A	Request counter values
…			
8	2 byte	Input B	Telegr. counter value 2 bytes
9	2 byte	Input B	Request counter values
…			
15	2 byte	Input C	Telegr. counter value 2 bytes
16	2 byte	Input C	Request counter values
…			
22	2 byte	Input D	Telegr. counter value 2 bytes
23	2 byte	Input D	Request counter values
…			

Communication objects
when used as a pulse counter (1 byte)

No.	Type	Object name	Function
…			
1	1 byte	Input A	Telegr. counter value 1 byte
2	1 byte	Input A	Request counter values
…			
8	1 byte	Input B	Telegr. counter value 1 byte
9	1 byte	Input B	Request counter values
…			
15	1 byte	Input C	Telegr. counter value 1 byte
16	1 byte	Input C	Request counter values
…			
22	1 byte	Input D	Telegr. counter value 1 byte
23	1 byte	Input D	Request counter values
…			

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

Common for all inputs:	
General:	
– Transmission delay [0…255 sec.] after bus voltage recovery	**2**
– The transmission delay time contains the initialization time	**<--- NOTE**
– Limit number of telegrams	yes / **no**
Only if “yes” is selected:	
– Max. number of transmitted telegrams within a period	**20**
– Period	50 ms / …/ **10 s** / … / 1 min
– Transmit object “Telegr. valve purge”	yes
	no
– This parameter is relevant for the controlling of an electronic relay	**<--- NOTE**
Only if “yes” is selected:	
– Transmit telegram every	7 days 14 days **30 days** 50 days
– Period of valve purge	1 min / **2 min** / 5 min / 10 min
Separate for each channel:	
– Function of the channel	**no function** Switch sensor Switch/dimming sensor Shutter sensor Value / forced operation Control scene Control electr. relay (heating actuator) Control LED Switching sequence (“latching relay”) Push button with multiple operation Counter

Parameters when used as a switch sensor. The default setting for the values is **printed in bold type.**

Only when used as a switch sensor:	
– Distinction between long and short operation	yes / **no**
Only if “yes” is selected:	
– Connected contact type	normally closed **normally open**
– Reaction on short operation	**ON** / OFF / TOGGLE / no reaction
– Reaction on long operation	ON / **OFF** / TOGGLE / no reaction
– Long operation after: Base	**100 ms** / 1 s / … / 1 min / … / 1 h
– Factor (2…255)	**5**
– Number of objects for short/long operation	**1 object** 2 objects
– Debounce time	10 ms debounce time / … / **50 ms debounce time** / 150 ms debounce time
Only if “no” is selected:	
– Cyclic transmission of object “Telegr. switch”	**no** if “switch” = ON if “switch” = OFF always
– Reaction on closing the contact (rising edge)	**ON** OFF TOGGLE no reaction terminate cyclic transmission
– Reaction on opening the contact (falling edge)	ON **OFF** TOGGLE no reaction terminate cyclic transmission
Only for cyclical sending:	
– Telegram is repeated every (“transmission cycle time”): base	100 ms / **1 s** / … / 1 min / … / 1 h
– Factor (1…255)	**30**
– Transmit object value after bus voltage recovery	yes / **no**
– Debounce time / min. operation time	10 ms debounce time … **50 ms debounce time** … 150 ms debounce time Minimum operation time

Parameters when used as as switch/ dimming sensor. The default setting for the values is **printed in bold type.**

Only when used as a switch/dimming sensor:	
– Connected contact type	normally closed **normally open**
– Dimming functionality	**Dimming and switching** Only dimming
For dimming and switching:	
– Reaction on short operation	ON / OFF / **TOGGLE** / no reaction
– Reaction on long operation	Dim BRIGHTER Dim DARKER **Dim BRIGHTER/DARKER**
– Long operation after	0.3 s / 0.4 s / **0.5 s** / … / 10 s
For dimming only:	
– Reaction on operation	Dim BRIGHTER Dim DARKER **Dim BRIGHTER/DARKER**
– Dimming mode	**Start-stop dimming** Dimming steps
Only for dimming steps:	
– Brightness change on every sent telegram	100 % / 50 % / 25 % / 12.5 % / 6.25 % / **3.13 %** / 1.56 %
– Transmission cycle time: telegram is repeated every	0.3 s / 0.4 s / **0.5 s** / … / 10 s
For dimming and switching:	
– Debounce time	10 ms debounce time / … / **50 ms debounce time** / 150 ms debounce time
For dimming only:	
– Debounce time / min. operation time	10 ms debounce time … **50 ms debounce time** … 150 ms debounce time Minimum operation time

Parameters when used as a shutter sensor**.** The default setting for the values is **printed in bold type.**

Only when used as a shutter sensor:	
– Operating functionality of blind	1 push button, short = stepping, long = moving 1 push button, short = moving, long = stepping 1 push button operation, moving 1 switch operation, moving **2 push button, standard** 2 switch operation, moving (shutter) 2 push button, moving (shutter) 2 push button, stepping
Only for 1 push button, short = stepping, long = moving:	
– Long operation: move UP/DOWN Short operation: Lamella	**<--- Note about functionality**
– Connected contact type	normally closed **normally open**
– Long operation after	0.3 s / 0.4 s / **0.5 s** / … / 10 s
– Debounce time	10 ms debounce time / … / **30 ms debounce time** / 150 ms debounce time
Only for 1 push button, short = moving, long = stepping:	
– Long operation: Lamella Short operation: move UP/DOWN	**<--- Note about functionality**
– Connected contact type	normally closed **normally open**
– Long operation after	0.3 s / 0.4 s / **0.5 s** / … / 10 s
– "Telegr. STOP/lamella adj." is repeated every	0.3 s / **0.4 s** / 0.5 s / … / 10 s
– Debounce time	10 ms debounce time / … / **30 ms debounce time** / 150 ms debounce time
Only for 1 push button operation, moving:	
– On every operation in succession UP - STOP - DOWN - STOP	**<--- Note about functionality**
– Connected contact type	normally closed **normally open**
– Debounce time	10 ms debounce time / … / **30 ms debounce time** / 150 ms debounce time
Only for 1 switch operation, moving:	
– On operation: UP/DOWN, end of operation: STOP	**<--- Note about functionality**
– Connected contact type	normally closed **normally open**
– Debounce time	10 ms debounce time / … / **30 ms debounce time** / 150 ms debounce time
Only for 2 push button, standard:	
– Short operation: STOP/Lamella UP/DOWN Long operation: move UP/DOWN	**<--- Note about functionality**
– Connected contact type	normally closed **normally open**
– Reaction on short operation	**STOP / Lamella UP** STOP / Lamella DOWN
– Reaction on long operation	**MOVE UP** MOVE DOWN
– Long operation after	0.3 s / 0.4 s / **0.5 s** / … / 10 s
– Debounce time	10 ms debounce time / … / **30 ms debounce time** / 150 ms debounce time

Parameters when used as a shutter sensor**.** The default setting for the values is **printed in bold type.**

Only for 2 switch operation, moving (shutter):	
– On operation: moving, end of operation: STOP	**<--- Note about functionality**
– Connected contact type	normally closed **normally open**
– Reaction on operation	**MOVE UP** MOVE DOWN
– Debounce time	10 ms debounce time / ... / **30 ms debounce time** / 150 ms debounce time
Only for 2 push button, moving (shutter):	
– On operation: moving	**<--- Note about functionality**
– Connected contact type	normally closed **normally open**
– Reaction on operation	**MOVE UP** MOVE DOWN
– Debounce time	10 ms debounce time / … / **30 ms debounce time** / 150 ms debounce time
Only for 2 push button, stepping:	
– On operation: stepping	**<--- Note about functionality**
– Connected contact type	normally closed **normally open**
– Reaction on operation	**STOP / Lamella UP** STOP / Lamella DOWN
– “Telegr. STOP/lamella adj.” is repeated every	0.3 s / **0.4 s** / 0.5 s / … / 10 s
– Debounce time	10 ms debounce time / … / **30 ms debounce time** / 150 ms debounce time

Parameters when used as a value / forced position input**.** The default setting for the values is **printed in bold type.**

Only when used as a value / forced position input:	
– Connected contact type	normally closed **normally open**
– Distinction between long and short operation	yes / **no**
Only if “yes” is selected:	
Separate for short/long operation:	
– Reaction on short (long) operation	no reaction 2 bit value (forced position) **1 byte value (0…255)** 2 byte value (-32768…32767) 2 byte value (0…65535) 2 byte value (floating point) 4 byte value (0…4294967295)
Only for 2 bit value (forced position):	
– Transmitted value	ON, activate forced position OFF, activate forced operation **Disable forced positioning**
Only for 1 byte value:	
– Transmitted value (0…255)	**0**
Only for 2 byte value (-32768…32767):	
– Transmitted value (-32768…32767)	**0**
Only for 2 byte value (0…65535):	
– Transmitted value (0…65535)	**0**
Only for 2 byte value (floating point):	
– Transmitted value	-100.00 / … / **20.00** / … / **100.00**
Only for 4 byte value (0…4294967295):	
– Transmitted value (0…4294967295)	**0**
– Long operation after: Base	**100 ms** / 1 s / … / 1 h
– Factor (2…255)	**4**

Parameters when used as a value / forced position input**.** The default setting for the values is **printed in bold type.**

– Debounce time	10 ms debounce time / … / **50 ms debounce time** / … / 150 ms debounce time
Only if “no” is selected:	
– Reaction on operation	no reaction 1 bit value 2 bit value (forced position) **1 byte value (0…255)** 2 byte value (-32768…32767) 2 byte value (0…65535) 2 byte value (floating point) 4 byte value (0…4294967295)
Only for 1 bit value:	
– Transmitted value	**0** / 1
Only for 2 bit value (forced position):	
– Transmitted value	ON, activate forced position OFF, activate forced operation **Disable forced positioning**
Only for 1 byte value:	
– Transmitted value (0…255)	**0**
Only for 2 byte value (-32768…32767):	
– Transmitted value (-32768…32767)	**0**
Only for 2 byte value (0…65535):	
– Transmitted value (0…65535)	**0**
Only for 2 byte value (floating point):	
– Transmitted value	-100.00 / … / **20.00** / … / 100.00
Only for 4 byte value (0…4294967295):	
– Transmitted value (0…4294967295)	**0**
– Transmit object value after bus voltage recovery	yes / **no**
– Debounce time / min. operation time	10 ms debounce time … **50 ms debounce time** … 150 ms debounce time Minimum operation time

Parameters when used for controlling scenes. The default setting for the values is **printed in bold type.**

Only when used for controlling scenes:	
– Connected contact type	normally closed **normally open**
– Control the scene via	**5 separate objects** 8 bit scene
Only for 8 bit scene:	
– No. of scene (0…63)	**0**
– Reaction on short operation	no reaction **Recall scene**
– Store scene	**no** on long operation with object value = 1 on long operation (if object value = 1)
– Long operation after	0.3 s / … / **3 s** / … / 10 s
– Debounce time	10 ms debounce time / … / **50 ms debounce time** / 150 ms debounce time
Only for 5 separate objects, separate for each actuator group:	
– Control of actuator group … via	**1 bit object** 8 bit object
Only for 1 bit object:	
– Preset value actuator group …	**ON** / OFF
Only for 1 byte object:	
– Preset value actuator group …	**0**

Parameters when used for controlling an electronic relay (heating actuator). The default setting for the values is **printed in bold type.**

Only when used for controlling an electronic relay (heating actuator):	
– Control telegram is received as	**1 bit (PWM or on-off control)** 1 byte (continuous)
– Connected valve type	**normally closed** normally open
– PWM cycle time for continuous control	20 s / 30 s / … / **1 min** / … / 1 h
– Enable object “Telegr. valve purge”	yes / **no**
– Enable monitoring of the controller, fault message, forced positioning	yes / **no**
– Position of the valve drive on bus voltage recovery	0 % (closed) 100 % (opened) 10 % **20 %** … 90 %
Only when monitoring of the controller is enabled:	
– Monitoring of the room thermostat	yes / **no**
Only if “yes” is selected:	
– Cyclic monitoring time of room thermostat: base	100 ms / … / **1 min** / … / 1 h
– Factor (1…155)	**20**
– Position of the valve drive on failure of the control	0 % (closed) 100 % (opened) **10 %** 20 % … 90 %
– Enable object “Telegr. fault”	yes / **no**
– Forced positioning	yes / **no**
Only if “yes” is selected:	
– Valve position during forced positioning	0 % (closed) 100 % (open) 10 % … **50 %** … 90 %

Parameters when used for controlling LEDs. The default setting for the values is **printed in bold type.**

Only when used for controlling LED:	
– LED functionality	**switch ON/OFF** Flashing
Only for “switch ON/OFF”:	
– LED is switched ON, if	**Object “Telegr. switch” = 1** Object “Telegr. switch” = 0
Only for “Flashing”:	
– LED flashes, if	**Object “LED flashing” = 1** Object “LED flashing” = 0
– LED is switched ON for	200 ms / … / **1 s** / … / 60 s
– LED is switched OFF for	200 ms / … / **1 s** / … / 60 s
– Time limit of LED control	yes / **no**
Only if “yes” is selected:	
–Time limit: base	100 ms / 1 s / **10 s** / … / 1 h
– Time limit: factor (1…255)	**5**
– Transmit status via object “Telegr. status/ackn.”	yes / **no**
– Status of LED on bus voltage recovery	**OFF** / ON

Parameters when used for switching sequences. The default setting for the values is **printed in bold type.**

Only when used for switching sequences (“latching relay”):	
– Connected contact type	normally closed **normally open**
– Number of objects	2 levels **3 levels** 4 levels 5 levels
– Type of switching sequence	**sequentially on/off (one push button)** on/off (several push buttons) All combinations
With only one push button:	
– Example for switching sequence …>000>001>011>111>011>001>000>…	**<--- NOTE**
With several push buttons:	
– Example for switching sequence 000>001>011>111	**<--- NOTE**
– Function on operation	**switch upwards** switch downwards
Only for all combinations:	
– Example for switching sequence …>000>001>011>010>110>111>101>…	**<--- NOTE**
– Debounce time / min. operation time	10 ms debounce time … **50 ms debounce time** … 150 ms debounce time Minimum operation time

Parameters when used as a push button with multiple operation. The default setting for the values is **printed in bold type.**

Only when used as a push button with multiple operation:	
– Connected contact type	**normally open** normally closed
– Max. number of operations (= number of objects)	single operation 2-fold operation **3-fold operation** 4-fold operation
– Transmitted value (object “Telegr. operation ...-fold“)	ON / OFF / **TOGGLE**
– Transmit value on every operation	yes / **no**
– Maximum time between two operations	0.3 s / … / **1 s** / … /10 s
– Additional object for long operation	yes / **no**
Only if “yes” is selected:	
– Long operation after	0.3 s / … / **0.5 s** / … /10 s
– Transmitted value (object “Telegr. operation long”)	ON / OFF / **TOGGLE**
– Debounce time	10 ms debounce time / … / **50 ms debounce time** / … / 150 ms debounce time

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Parameters when used as a pulse counter. The default setting for the values is **printed in bold type.**

Only when used as a pulse counter:	
– Pulse detection on	**closing contact (rising edge)** opening contact (falling edge)
– Data width of counter	8 bit (0…255) 16 bit (-32.768…32.767) 16 bit (0…65.535) **32 bit (-2.147.483.648 …2.147.483.647)**
Only for 8 bit:	
– Counter starts at (0…255)	**0**
Only for 16 bit (-32.768…32.767):	
– Counter starts at (-32.768…32.767)	**0**
Only for 16 bit (0…65.535):	
– Counter starts at (0…65.535)	**0**
Only for 32 bit (-2.147.483.648…2.147.483.647):	
– Counter starts at (-2.147.483.648…2.147.483.647)	**0**
– Debounce time / min. operation time	10 ms debounce time … **50 ms debounce time** … 150 ms debounce time Min. operation time
– The debounce time must be shorter than the pulse period of the input signal	**<--- NOTE**
– Transmit counter values after bus voltage recovery	yes / **no**
– Enable additional options (factor/divider, cyclical transmission)	yes / **no**
Only if additional options are enabled:	
– Divider: number of input pulses for one counter step (1…32767)	**1**
– Factor: one counter step changes counter value by (-32768…32767)	**1**
– Transmit counter values cyclically	yes / **no**
Only if “yes” is selected:	
– Counter values are being transmitted every: Base	**1 s** / … / 1 h
– Factor (1…255)	**30**
– Enable differential counter	yes / **no**
Only if “yes” is selected:	
– Over-/underrun of differential counter at (-2147483648… 2147483647)	**1000**
– The overrun value must be greater than the factor	**<--- NOTE**