Technical Manual

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KNX Logic Module

SCN-LOG1.02

Further documents:

Datasheet:
https://www.mdt.de/EN_Downloads_Datasheets.html

Assembly and Operation instructions:
https://www.mdt.de/EN_Downloads_Instructions.html

Solution proposals for MDT products:
https://www.mdt.de/en/for-professionals/tips-tricks.html

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1 Content

2 Overview

2.1 Overview Devices

This manual refers to the following devices (Article number in **bold**).

- **SCN-LOG1.02** Logic Module, 2SU MDRC

2.2 Functions

24 independent function blocks can be customised with the following functions:

- Universal Logic
- Send / request after reset
- Cyclic sending or request
- Scene controller / Control table
- Telegram multiplier / Sequencer
- Converting of datapoint types
- Comparison of temperature/values
- Time functions
- Converting to PWM
- Logic Gate / Inverter
- Save value and send after reset
- Monitoring of telegrams
- Multiplexer / Partition control
- Universal Calculator
- Filter functions / Limiter
- Min/Max/Average Value
- Follow up control with ventilation

Universal Logic
Up to 4 “AND” conditions can be combined and the result of this combination can be combined with a 5th “OR” condition.
Example:
IF (condition 1) AND (condition 2) AND (condition 3) AND (condition 4) OR (condition 5)
THEN value / scene
ELSE value / scene

Logic Gate / Inverter
With the logic gate, you can choose between a logic gate with 8 selectable inputs and the functions “AND”, “OR”, “EXCLUSIVE OR” and a logic inverter with 4 inputs. The inputs and outputs can each be inverted single. Internal objects can be used as inputs.

Send / request after reset
This function can be used to request any value after a reset. It is possible to send any value with a time delay after a reset. The time can be set from 1 second up to 240 minutes.

Save value and send after reset
The last value received is saved and sent back to the bus after bus power return. This restores the status before the bus voltage failure.

Cyclic sending or request
Any values can be sent or requested cyclically. The time is freely adjustable from 1 second up to 240 hours. With the cyclical request, the missing cyclical sending can be retrofitted to older KNX devices.

Monitoring of telegrams
The cyclical sending of any telegram can be monitored. The monitoring time of the input object can be set between 1 second and 240 hours. Fault messages can also be sent in plain text.

Scene controller / Control table
With the scene control / control table, conditions can be formulated quickly and clearly for up to 7 inputs in order to send a scene or a value respectively. Up to 8 different conditions / output values can be defined.

Multiplexer / Partition control
The multiplexer function, also known as the partition function, can be used to switch data exchange between two objects on and off via the control of an input object.

Telegram multiplier / Sequencer
When an input object is received, up to 4 output objects with definable values are sent when a condition is met. The DPT of the output objects can be selected independently of the format of the input object.

Universal Calculator
The universal calculator consists of two calculation blocks, each of which can add, subtract, multiply and divide. Each calculation block can use two input objects or one input object and a configured value. A third arithmetic block can calculate the output values of the first and second arithmetic blocks.

Converting of datapoint types
The format converter function converts an input object into an output object with a different length. The thresholds for the conversion can be freely configured for this purpose.

Filter functions / Limiter
Binary values can be filtered by "0" or "1", or divided into 2 objects. Depending on the DPT, minimum or maximum values can be limited. You can choose to send "only valid values" or to send these values if the minimum or maximum values are undershot or exceeded. The filter function can be activated or deactivated via a lock object.

Comparison of temperature/values
Any values, such as temperatures, can be compared and analysed. The function also supports a second comparison with AND/OR operation. The result of the comparison is sent via a 1 bit output object.

Min/Max/Average Value
The minimum, maximum or average value can be generated from up to 4 input values. This value will be sent via an output object.

Time function
Status changes at the input object will be sent to the output object with a switch-on or switch-off delay. This function can also be used to realise "staircase lighting control" or "switching on again after an adjustable time".

Follow up control with ventilation
Run-on control with separately adjustable switch-on and switch-off delay. In addition, the ventilation is increased by steps or an adjustable percentage.
Example: When using the toilet, the ventilation can switch from 30 to 50% after the switch-on delay has passed, and back to 30% after the follow-up time has passed.

Converting to PWM
A 1 byte value 0-100% is converted into a switch object with pulse width modulation.
Example: An electric heater can be controlled via a switch actuator with a control value. The PWM cycle time is adjustable.

2.3 Wiring diagram

The following figure shows an exemplary wiring diagram:

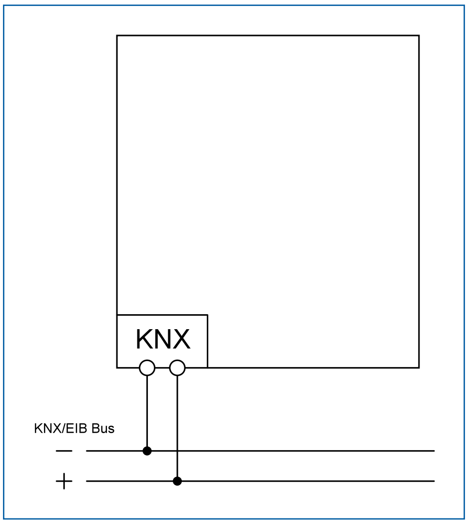

Figure 1: Wiring diagram

2.4 Structure & Handling

The following picture shows the structure of the device:

Figure 2: Structure and operation

1	=	KNX Bus connection terminal	2	=	Programming button
3	=	Programming LED	4	=	Function LEDs

2.5 Commissioning

1. Wire the device according to the connection diagram.
2. Connect the interface to the bus.
3. Switch on the bus voltage.
4. Press the programming button on the device > 1 s (red programming LED lights up continuously).
5. Set and programme the physical address in the ETS (programming LED switches off).
6. Configure and programme settings in the application programme.

3 Communication objects

3.1 Standard settings of the communication objects

Standard settings – Universal Logic								
No.	Name	Object function	Length	C	R	W	T	U
0	F1:	Universal Logic Input 1	1 Bit 2 Bit 1 Byte 2 Byte 4 Byte	■		■	■	■
1	F1:	Universal Logic Input 1 - comparative value		■		■	■	■
2	F1:	Universal Logic Input 2		■		■	■	■
3	F1:	Universal Logic Input 2 - comparative value		■		■	■	■
4	F1:	Universal Logic Input 3	1 Bit 1 Byte	■		■	■	■
5	F1:	Universal Logic Input 4	1 Bit 1 Byte	■		■	■	■
6	F1:	Universal Logic Input 5	1 Bit 1 Byte	■		■	■	■
8	F1:	Universal Logic Lock	1 Bit	■		■		
8	F1:	Universal Logic Enabling	1 Bit	■		■		
9	F1.	Universal Logic Output	1 Bit 1 Byte	■	■		■	
+10	**next function**							

Table 1: Communication objects – Standard setting: Universal Logic

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Standard settings – Logic gate / Inverter								
No.	Name	Object function	Length	C	R	W	T	U
0	F1:	Logic Input 1	1 Bit	■		■	■	■
0	F1:	Inverter input 1	1 Bit	■		■	■	■
1	F1:	Logic Input 2	1 Bit	■		■	■	■
1	F1:	Inverter output 2	1 Bit	■	■		■	
2	F1:	Logic Input 3	1 Bit	■		■	■	■
2	F1:	Inverter input 2	1 Bit	■		■	■	■
3	F1:	Logic Input 4	1 Bit	■		■	■	■
3	F1:	Inverter output 2	1 Bit	■	■		■	
4	F1:	Logic Input 5	1 Bit	■		■	■	■
4	F1:	Inverter input 3	1 Bit	■		■	■	■
5	F1:	Logic Input 6	1 Bit	■		■	■	■
5	F1:	Inverter output 3	1 Bit	■	■		■	
6	F1:	Logic Input 7	1 Bit	■		■	■	■
6	F1:	Inverter input 4	1 Bit	■		■	■	■
7	F1:	Logic Input 8	1 Bit	■		■	■	■
7	F1:	Inverter output 4	1 Bit	■	■		■	
8	F1:	Logic Lock	1 Bit	■		■		
8	F1:	Logic Enabling	1 Bit	■		■		
9	F1:	Logic Output	1 Bit 1 Byte	■	■		■	
+10	**next function**							

Table 2: Communication objects – Standard setting: Logic gate / Inverter

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Standard settings – Send/request after reset								
No.	**Name**	**Object function**	**Length**	**C**	**R**	**W**	**T**	**U**
0	F1:	Send after reset	1 Bit 2 Bit 4 Bit 1 Byte 2 Byte 3 Byte 4 Byte 14 Byte	■	■		■	
0	F1:	Request after reset		■	■		■	
+10	**next function**							

Table 3: Communication objects – Standard setting: Send/request after reset

Standard settings – Save value and send after reset								
No.	**Name**	**Object function**	**Length**	**C**	**R**	**W**	**T**	**U**
0	F1:	Send after reset	1 Bit 2 Bit 1 Byte 2 Byte 3 Byte 4 Byte	■		■	■	■
+10	**next function**							

Table 4: Communication objects – Standard setting: Save value and send after reset

Standard settings – Cyclic sending or request								
No.	**Name**	**Object function**	**Length**	**C**	**R**	**W**	**T**	**U**
0	F1:	Request value cyclic	1 Bit 2 Bit 4 Bit 1 Byte 2 Byte 3 Byte 4 Byte 14 Byte	■			■	
0	F1:	Send value cyclic		■			■	
7	F1:	Request requirement	1 Bit	■		■		
8	F1:	Logic Lock	1 Bit	■		■		
8	F1:	Logic Enabling	1 Bit	■		■		
+10	**next function**							

Table 5: Communication objects – Standard setting: Cyclic sending or request

Standard settings – Monitoring of telegrams								
No.	**Name**	**Object function**	**Length**	**C**	**R**	**W**	**T**	**U**
0	F1:	Telegram monitoring Input	1 Bit 2 Bit 4 Bit 1 Byte 2 Byte 3 Byte 4 Byte 14 Byte	■		■	■	■
4	F1:	Telegram monitoring Output	1 Bit 2 Bit 1 Byte 14 Byte	■	■		■	
+10	**next function**							

Table 6: Communication objects – Standard setting: Monitoring of telegrams

Standard settings – Scene controller / Control table								
No.	Name	Object function	Length	C	R	W	T	U
0	F1:	Scene control Input 1	1 Bit	■		■	■	■
1	F1:	Scene control Input 2	1 Bit	■		■	■	■
2	F1:	Scene control Input 3	1 Bit	■		■	■	■
3	F1:	Scene control Input 4	1 Bit	■		■	■	■
4	F1:	Scene control Input 5	1 Bit	■		■	■	■
5	F1:	Scene control Input 6	1 Bit	■		■	■	■
6	F1:	Scene control Input 7	1 Bit	■		■	■	■
8	F1:	Logic Lock	1 Bit	■		■		
8	F1:	Logic Enabling	1 Bit	■		■		
9	F1:	Logic Output	1 Bit 1 Byte	■	■		■	
+10	**next function**							

Table 7: Communication objects – Standard setting: Scene controller / Control table

Standard settings – Multiplexer / Partition control								
No.	Name	Object function	Length	C	R	W	T	U
0	F1:	Multiplexer Input/Output 1	1 Bit 2 Bit 4 Bit 1 Byte 2 Byte	■	■	■	■	
1	F1:	Multiplexer Input/Output 2		■	■	■	■	
2	F1:	Multiplexer Input/Output 3		■	■	■	■	
3	F1:	Multiplexer Input/Output 4		■	■	■	■	
4	F1:	Multiplexer Control input	1 Bit	■		■		
8	F1:	Logic Lock	1 Bit	■		■		
8	F1:	Logic Enabling	1 Bit	■		■		
+10	**next function**							

Table 8: Communication objects – Standard setting: Multiplexer / Partition control

Standard settings – Telegram multiplier / sequencer								
No.	Name	Object function	Length	C	R	W	T	U
0	F1:	Sequencer Input	1 Bit 1 Byte	■		■	■	■
1	F1:	Sequencer Output 1	1 Bit 2 Bit 1 Byte 2 Byte	■	■		■	
2	F1:	Sequencer Output 2		■	■		■	
3	F1:	Sequencer Output 3		■	■		■	
4	F1:	Sequencer Output 4		■	■		■	
8	F1:	Logic Lock	1 Bit	■		■		
8	F1:	Logic Enabling	1 Bit	■		■		
+10	**next function**							

Table 9: Communication objects – Standard setting: Telegram multiplier / sequencer

Standard settings – Universal calculator								
No.	Name	Object function	Length	C	R	W	T	U
0	F1:	Universal calculator Input 1	1 Bit 1 Byte 2 Byte 4 Byte	■		■	■	■
1	F1:	Universal calculator Input 2		■		■	■	■
2	F1:	Universal calculator Input 3		■		■	■	■
3	F1:	Universal calculator Input 4		■		■	■	■
4	F1:	Universal calculator Output 1		■	■		■	
5	F1:	Universal calculator Output 2		■	■		■	
6	F1:	Universal calculator Output 3		■	■		■	
7	F1:	Universal calculator Impulse input	1 Bit	■		■	■	■
8	F1:	Logic Lock	1 Bit	■		■		
8	F1:	Logic Enabling	1 Bit	■		■		
+10	**next function**							

Table 10: Communication objects – Standard setting: Universal calculator

Standard settings – Converting of datapoint types								
No.	Name	Object function	Length	C	R	W	T	U
0	F1:	Format Converter Input	1 Bit 2 Bit 1 Byte 2 Byte	■		■	■	■
0	F1:	Format Converter Input 1	1 Bit	■		■	■	■
0	F1:	Format Converter Input priority	1 Bit	■		■	■	■
0	F1:	Format converter level 1 Input	1 Bit	■		■	■	■
0	F1:	Format converter Output 1	1 Bit 1 Byte	■	■		■	
0	F1:	Format converter level 1 Output	1 Bit	■	■		■	
0	F1:	Format converter value 1 Input	1 Byte	■		■	■	■
0	F1:	Format converter value 1 Output	1 Byte	■	■		■	
1	F1:	Format converter Control Input	1 Bit	■		■	■	■
1	F1:	Format converter Input 2	1 Bit	■		■	■	■
1	F1:	Format converter Input value	1 Bit	■		■	■	■
1	F1:	Format converter level 2 Input	1 Bit	■		■	■	■
1	F1:	Format converter Output 2	1 Bit 1 Byte	■	■		■	
1	F1:	Format converter level 2 Output	1 Bit	■	■		■	
1	F1:	Format converter value 2 Input	1 Byte	■		■	■	■
1	F1:	Format converter value 2 Output	1 Byte	■	■		■	
2	F1:	Format converter Input 3	1 Bit	■		■	■	■
2	F1:	Format converter level 3 Input	1 Bit	■		■	■	■
2	F1:	Format converter Output 3	1 Bit 1 Byte	■	■		■	
2	F1:	Format converter level 3 Output	1 Bit	■	■		■	
2	F1:	Format converter value 3 Input	1 Byte	■		■	■	■
2	F1:	Format converter value 3 Output	1 Byte	■	■		■	
3	F1:	Format converter Input 4	1 Bit	■		■	■	■
3	F1:	Format converter level 4 Input	1 Bit	■		■	■	■
3	F1:	Format converter Output 4	1 Bit 1 Byte	■	■		■	

Standard settings – Converting of datapoint types								
No.	Name	Object function	Length	C	R	W	T	U
3	F1:	Format converter level 4 Output	1 Bit	■	■		■	
3	F1:	Format converter value 4 Input	1 Byte	■		■	■	■
3	F1:	Format converter value 4 Output	1 Byte	■	■		■	
4	F1:	Format converter Output	1 Bit 1 Byte 2 Bit 2 Byte 3 Byte 4 Byte 14 Byte	■	■		■	
4	F1:	Format converter Input 5	1 Bit	■		■	■	■
4	F1:	Format converter level 5 Input	1 Bit	■		■	■	■
4	F1:	Format converter Priority, ON	1 Bit	■	■		■	
4	F1:	Format converter Output 5	1 Bit	■	■		■	
4	F1:	Format converter level 5 Output	1 Bit	■	■		■	
4	F1:	Format converter Input	2 Byte 14 Byte	■		■	■	■
5	F1:	Format converter Input 6	1 Bit	■		■	■	■
5	F1:	Format converter level 6 Input	1 Bit	■		■	■	■
5	F1:	Format converter Priority, OFF	1 Bit	■	■		■	
5	F1:	Format converter ON/OFF	1 Bit	■	■		■	
5	F1:	Format converter Output 6	1 Bit	■	■		■	
5	F1:	Format converter level 6 Output	1 Bit	■	■		■	
6	F1:	Format converter Input 7	1 Bit	■		■	■	■
6	F1:	Format converter level 7 Input	1 Bit	■		■	■	■
6	F1:	Format converter Priority active	1 Bit	■	■		■	
6	F1:	Format converter Output 7	1 Bit	■	■		■	
6	F1:	Format converter level 7 Output	1 Bit	■	■		■	
7	F1:	Format converter Input 8	1 Bit	■		■	■	■
7	F1:	Format converter level 8 Input	1 Bit	■		■	■	■
7	F1:	Format converter Output 8	1 Bit	■	■		■	
7	F1:	Format converter level 8 Output	1 Bit	■	■		■	

Standard settings – Converting of datapoint types								
No.	Name	Object function	Length	C	R	W	T	U
8	F1:	Logic Lock	1 Bit	■		■		
8	F1:	Logic Enabling	1 Bit	■		■		
9	F1:	Format converter Output	1 Byte	■	■		■	
9	F1:	Format converter Input	1 Byte	■		■		
+10	**next function**							

Table 11: Communication objects – Standard setting: Converting of datapoint types

Standard settings – Filter functions / Limiter								
No.	Name	Object function	Length	C	R	W	T	U
0	F1:	Filter Input	1 Bit 2 Bit 4 Bit 1 Byte 2 Byte 3 Byte 4 Byte	■		■	■	■
1	F1:	Filter Control Input	1 Bit	■		■	■	■
4	F1:	Filter Output ON	1 Bit	■	■		■	
4	F1:	Filter Output OFF	1 Bit	■	■		■	
4	F1:	Filter Output	2 Bit 4 Bit 1 Byte 2 Byte 3 Byte 4 Byte	■	■		■	
5	F1:	Filter Output Off	1 Bit	■	■		■	
8	F1:	Logic Lock	1 Bit	■		■		
8	F1:	Logic Enabling	1 Bit	■		■		
+10	**next function**							

Table 12: Communication objects – Standard setting: Filter functions / Limiter

Standard settings – Comparison of temperature / values								
No.	Name	Object function	Length	C	R	W	T	U
0	F1:	Comparator temperature value 1 Input	2 Byte	■		■	■	■
0	F1:	Comparator value 1 Input	1 Byte 2 Byte 4 Byte	■		■	■	■
1	F1:	Comparator temperature value 2 Input	2 Byte	■		■	■	■
1	F1:	Comparator value 2 Input	1 Byte 2 Byte 4 Byte	■		■	■	■
2	F1:	Comparator temperature value 3 Input	2 Byte	■		■	■	■
2	F1:	Comparator value 3 Input	1 Byte 2 Byte 4 Byte	■		■	■	■
3	F1:	Comparator temperature value 4 Input	2 Byte	■		■	■	■
3	F1:	Comparator value 4 Input	1 Byte 2 Byte 4 Byte	■		■	■	■
4	F1:	Comparator Output	1 Bit	■	■		■	
8	F1:	Logic Lock	1 Bit	■		■		
8	F1:	Logic Enabling	1 Bit	■		■		
+10	**next function**							

Table 13: Communication objects – Standard setting: Comparison of temperature / values

Standard settings – Min/Max/Average value								
No.	Name	Object function	Length	C	R	W	T	U
0	F1:	Minimum value Input 1	1 Byte 2 Byte 4 Byte	■		■	■	■
0	F1:	Maximum value Input 1		■		■	■	■
0	F1:	Average value Input 1		■		■	■	■
1	F1:	Minimum value Input 2		■		■	■	■
1	F1:	Maximum value Input 2		■		■	■	■
1	F1:	Average value Input 2		■		■	■	■
2	F1:	Minimum value Input 3		■		■	■	■
2	F1:	Maximum value Input 3		■		■	■	■
2	F1:	Average value Input 3		■		■	■	■
3	F1:	Minimum value Input 4		■		■	■	■
3	F1:	Maximum value Input 4		■		■	■	■
3	F1:	Average value Input 4		■		■	■	■
4	F1:	Minimum value Output		■	■		■	
4	F1:	Maximum value Output		■	■		■	
4	F1:	Average value Output		■	■		■	
8	F1:	Logic Lock	1 Bit	■		■		
8	F1:	Logic Enabling	1 Bit	■		■		
+10	**next function**							

Table 14: Communication objects – Standard setting: Min/Max/Average value

Standard settings – Time functions								
No.	Name	Object function	Length	C	R	W	T	U
0	F1:	Time function Input	1 Bit	■		■	■	■
1	F1:	Time function Output	1 Bit 1 Byte	■	■		■	
8	F1:	Logic Lock	1 Bit	■		■		
8	F1:	Logic Enabling	1 Bit	■		■		
+10	**next function**							

Table 15: Communication objects – Standard setting: Time functions

Standard settings – Follow-up control with ventilation								
No.	Name	Object function	Length	C	R	W	T	U
0	F1:	Follow up control Input	1 Bit	■		■	■	■
1	F1:	Time function Output	1 Bit 1 Byte	■	■		■	
4	F1:	Ventilation Input	1 Byte	■		■	■	■
5	F1:	Ventilation Output	1 Byte	■	■		■	
8	F1:	Logic Lock	1 Bit	■		■		
8	F1:	Logic Enabling	1 Bit	■		■		
+10	**next function**							

Table 16: Communication objects – Standard setting: Follow-up control with ventilation

Standard settings – Converting to PWM								
No.	Name	Object function	Length	C	R	W	T	U
0	F1:	PWM Input	1 Byte	■		■	■	■
1	F1:	PWM Output	1 Bit	■	■		■	
8	F1:	Logic Lock	1 Bit	■		■		
8	F1:	Logic Enabling	1 Bit	■		■		
+10	**next function**							

Table 17: Communication objects – Standard setting: Converting to PWM

Standard settings – LED								
No.	Name	Object function	Length	C	R	W	T	U
240	LED 1	Switch	1 Bit	■		■		
241	LED 2	Switch	1 Bit	■		■		
242	LED 3	Switch	1 Bit	■		■		
243	LED 4	Switch	1 Bit	■		■		

Table 18: Communication objects – Standard setting: LED

Standard settings – Global Settings								
No.	Name	Object function	Length	C	R	W	T	U
244	Date/Time	Receive	8 Byte	■		■		
244	Time	Receive	3 Byte	■		■		
245	Date	Receive	3 Byte	■		■		
246	Minute cycle	Output	1 Bit 1 Byte	■	■		■	
247	Hour cycle	Output	1 Bit 1 Byte	■	■		■	
248	Day Cycle	Output	1 Bit 1 Byte	■	■		■	
249	Sunrise	Output	1 Bit	■	■		■	
250	Sundown	Output	1 Bit	■	■		■	
251	Dusk	Output	1 Bit	■	■		■	
252	Summer-/ Wintertime	Toggle	1 Bit	■	■		■	
253	Day/Night	Output	1 Bit	■	■		■	
254	Operating	Status	1 Bit	■	■		■	

Table 19: Communication objects – Standard setting: Global settings

The priority of the individual communications objects and the flags can be adjusted by the user as required. The flags assign the communication objects their respective tasks in programming, where C stands for communication, R for read, W for write, T for transmit and U for update

4 ETS Parameter

4.1 Global settings

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Startup delaytime	2 ... 240 s **[2 s]**	Defines the time between the bus power return and the functional start of the device.
Send Operating cyclic	**not active** 1 min – 24 h	Activation of a cyclical “In operation” telegram.
Cyclic sending during locking	▪ **disable** ▪ enable	Disables or allows cyclic sending while the function is locked.
Objects for Date and Time	▪ **common object** ▪ separated object	Determines whether date and time are received in a common object.
Time change	▪ no summer-/ wintertime ▪ **toggle automatically summer- and wintertime**	Defines whether the clock should change automatically between summer and winter time.
Location determination by	▪ coordinates ▪ **place**	Setting how the location is to be calculated.
Setting via location:		
Country	any country **[Germany]**	Setting of the country.
Town	any city **[Engelskirchen]**	Setting of the city.
Setting via coordinates:		
Latitude	▪ **north** ▪ south	Determining whether to count in northern or southern latitude.
Latitude in degrees [0° - 90°]	0° ... 90° **[50°]**	Determination of the latitude.
Latitude in minutes [0´ - 59´]	0´ ... 59´ **[56´]**	Definition of the minutes in latitude.
Longitude	▪ **east** ▪ west	Determining whether to count in east or west longitude.
Longitude in degrees [0° - 180°]	0° ... 180° **[6°]**	Determination of the longitude.

ETS Text	Dynamic range **[Default value]**	Comment
Longitude in minutes [0´ - 59´]	0´ ... 59´ **[57´]**	Definition of the minutes in longitude.
Time difference from universal time(UTC+...)	any time zone **[UTC + 01:00 Amsterdam, Berlin]**	Setting the time zone for calculating the position of the sun.
Configuration of general objects		
Object for summer-/ wintertime	▪ **not active** ▪ summer = value 1 ▪ winter = value 1	Defines how the object for summer/ winter time is displayed. **Only for "Time change" → "toggle automatically summer- and wintertime".**
Object for sunrise	▪ **inactive** ▪ send value 1 ▪ send value 0	Output of a value at the calculated time of sunrise.
Offset to sunrise	-120 ... 120 min. **[0 min]**	Shifts the output of the "Sunrise" object by the configured time. **Only for "Object for sunrise" → "send value ...".**
Object for dusk	▪ **inactive** ▪ send value 1 ▪ send value 0	Output of a value ("1" or "0") at the calculated time of dusk.
Offset to sundown	-120 ... 120 min. **[-30 min]**	Shifts the output of the "Dusk" object by the configured time. **Only for "Object for dusk" → "send value ...".**
Object for sundown	▪ **inactive** ▪ send value 1 ▪ send value 0	Output of a value ("1" or "0") at the calculated time of sunset.
Offset for sundown	-120 ... 120 min. **[0 min]**	Shifts the output of the "Sundown" object by the set time. **Only for "Object for sundown" → "send value...".**
Object for minute cycle / hour cycle	▪ **inactive** ▪ send value 1 ▪ send value 0 ▪ send minutes as Byte value	Determines whether and how a minute cycle /hour cycle is sent out.

ETS Text	Dynamic range **[Default value]**	Comment
Object for day cycle	▪ **inactive** ▪ send value 1 ▪ send value 0 ▪ send day as Byte value ▪ send 1 if weekend	Determines whether and how a daily cycle is sent out.
Object for Day/Night	▪ **not active** ▪ Day = 1, Night = 0 ▪ Day = 0, Night = 1	Defines whether and which value is to be sent at the “Day/Night - Output” object.
Beginning of day with	▪ **fix time** ▪ sunrise ▪ sunrise or at the latest at ... ▪ sunrise but at the earliest at ...	Defines when to switch from Night to Day. **If “Object for Day/Night” is active.**
Hours	0 ... 23 h **[0 h]**	Setting of the hour or minute value for “Beginning of day with”. **Not if “Beginning of day with” → “sunrise ...”.**
Minutes	0 ... 59 min **[0 min]**	
Beginning of night with	▪ **fix time** ▪ sunrise ▪ sunrise or at latest at ... ▪ sunrise but at earliest at ... ▪ dusk ▪ dusk or at the latest at ... ▪ dusk but at the earliest at ...	Defines when to switch from Day to Night. **If “Object for Day/Night” is active.**
Hours	0 ... 23 h **[0 h]**	Setting the hour and minute value for “Beginning of night with”. **Not if “Beginning of night with” → “sunrise ...” or “dusk ...”.**
Minutes	0 ... 59 min **[0 min]**	

Table 20: Settings – Global settings

Startup time
This time defines when the device "boots up" after a restart (reset, reprogramming, bus voltage return). This can be important if, for example, a bus reset is carried out. If there are many devices on a line, all devices would start at the same time and place a load on the bus. With a variable time, the devices can start differently.

Send Operation cyclic
The "Operation" telegram is used to show on the bus that the device is "alive". If activated, an ON telegram is sent cyclical.

Cyclic sending during locking
This object enables or disables the cyclic sending of the output values globally for all functions while the respective function is locked.

Objects for Date and Time
Depending on the system configuration, the date and time are received together as an 8 byte object or as a single 3 byte object. The values for date and time are required to process time and weekday functions in the "Universal logic" function.

Location determination by
The physical location must be defined in order to be able to calculate sunrise and sunset times as well as dusk. To do this, you can either select a country and a town from a list or you can define the location by setting geo coordinates.

Position of the sun
The parameters "Object for sunrise", "Object for dusk" and "Object for sundown" are calculated based on the location and can be linked in some main functions. These are each provided with their own "offset time" to activate the corresponding object with a time delay. You can set whether the object sends a "0" or a "1".

Timing
The "Object for minute cycle", "Object for hour cycle" and "Object for day cycle" parameters can be used to control the transmission behaviour of the "Minute cycle", "Hour cycle" and "Day cycle" objects. The minute and hour cycle can be output as "0", "1" or as an integer. The daily cycle can also send a "1" at the weekend For the daily cycle, the byte object corresponds to "1" = Monday.

Day / Night
For both, the day and night function, you can define whether the "Object for day/night" is sent as "day = 1, night = 0" or as "day = 0, night = 1". The switchover is carried out either via a fixed time or via sunrise/sunset.
In addition, a time can be entered for "Sunrise or at the latest at ..." to switch to day before sunrise. The same behaviour applies to the parameter "Sunset but at ... at the earliest at".

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
244	Time – Receive	3 Byte	Receive the time.
244	Date/Time – Receive	8 Byte	Receiving time and date values.
245	Date – Receive	3 Byte	Receive the date.
246	Minute cycle – Output	1 Bit 1 Byte	Output of a value (“1”, “0” or minute value) at one-minute intervals every full minute.
247	Hour cycle – Output	1 Bit 1 Byte	Output of a value (“1”, “0” or hourly value) at hourly intervals on the hour.
248	Day cycle – Output	1 Bit 1 Byte	Output of a value (“1”, “0” or day number) always at 00:00 a.m. For byte value: Mon = 1; Tue = 2; ... Sun = 7
249	Sunrise – Output	1 Bit	Output of a value at the time of sunrise.
250	Sundown – Output	1 Bit	Output of a value at the time of sunset.
251	Dusk – Output	1 Bit	Output of a value at the time of dusk.
252	Summer-/ Wintertime – Toggle	1 Bit	Sends a value indicating whether the device is in summer or winter time mode. The object is sent in an interval of 60 minutes.
253	Day/Night – Output	1 Bit	Sends a value indicating whether the device is in Day or Night mode.
254	Operating – Status	1 Bit	Sending a cyclic “In operation” telegram.

Table 21: Communication objects – Global settings

4.2 Identical settings

Some parameters are identical for all functions. These are described below.

For each channel, two text fields are available for free labelling:

Description of function	Example - function
Additional text	Changeover switch 1 and 4
Main function	Universal Logic ▼

Figure 3: Identical settings – Labelling fields

The **"Description of function"** parameter is used to improve clarity in the ETS. A text with up to 40 characters is permitted.
The text entered for the "Description of function" appears both in the menu after the corresponding function and in the communication objects of the function.

Selection of functions

F1: Example - function

...

Communication object

⇆|1	F1: Example - function	Logic Input 1
⇆|9	F1: Example - function	Logic Output 1

Figure 4: Identical settings – Text for object description

The text entered for **"Additional text"** only appears in this menu tab and is used to describe the function. A text with up to 40 characters is allowed here.

4.3 Functions

The device has 24 functions. Each function has the same structure and can be programmed independent of each other.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Main function	▪ **not active** ▪ Universal Logic ▪ Logic gate / Inverter ▪ Send/request after reset ▪ Save value and send after reset ▪ Cyclic sending or request ▪ Monitoring of telegrams ▪ Scene controller / Control table ▪ Multiplexer / Partition control ▪ Telegram multiplier / sequencer ▪ Universal calculator ▪ Converting of datapoint types ▪ Filter functions / Limiter ▪ Comparison of temperatures/values ▪ Min/Max/Average value ▪ Time functions ▪ Follow-up control with ventilation ▪ Converting to PWM	Selection of the main function.

Table 22: Settings – Main functions

The description of the main functions can be found in chapter 5.

5 Main Function

5.1 Universal Logic

With universal logic, it is a case of "IF - THEN - ELSE" logic.

Unlike the "Logic gate" function, the "Universal Logic" function can be used to link not only boolean 1 bit values, but also a variety of datapoint types.
Any datapoint type can be selected for each condition. The assigned object is assessed as true (1) or false (0) by selecting a rating ("Rating") and values ("Value" or a "Scene number").
Up to 4 conditions can be " AND" linked in this way and the result then linked with a 5th "OR" condition.

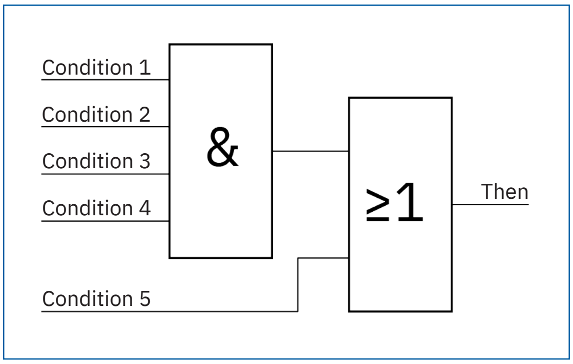

Figure 5: Diagram – Universal logic

Application example:
An awning should be extended as light protection when:
- the brightness is more than 2000 lux.
- and someone is present.
- and the time is between 09:00 and 16:00.
- or is lowered via an external blind push-button.

Function	Number	DPT	Data Type	Condition	Value	Comparable
1	0	7.013	brightness	greater than	2000	
2	-/-	10.001	time of day	between	09:00 h	16:00h
3	3	1.001	switch	equal	1	
4	-/-		not active			
5	6	1.001	switch	equal	1	
Then	9	1.008	up/down	equal	1	
Else	-/-	1.008	up/down	equal	0	

Table 23: Universal Logic – Example of linking

Main function	Universal Logic ▼	
Condition 1: IF		
Text for condition 1	brightness > 2000 Lux	
Select datapoint type for input 1	DPT 7.* 2 Byte unsigned value ▼	
Assessment	greater than or equal ▼	
Comparative value via	○ object	◉ parameter
Comparative value	2000	
Condition 2: AND	○ not active	◉ active
Text for condition 2	time between 09:00 and 16:00	
Selection datapoint type for input 2	Time ▼	
Assessment	between 2 comparables ▼	
from		
Hour	9	h
Minutes	0	min
to		
Hour	16	h
Minutes	0	min
Condition 3: AND	○ not active	◉ active
Text for condition 3	Presence	
Selection datapoint type for input 3	DPT 1.002 boolean ▼	
State equal	○ value 0	◉ value 1
Condition 4: AND	◉ not active	○ active
Condition 5: OR	○ not active	◉ active
Text for condition 5	external blind push-button	
Selection datapoint type for input 5	DPT 1.002 boolean ▼	
State equal	○ value 0	◉ value 1
THEN (Condition is true)		
Selection datapoint type for output	DPT 1.002 boolean ▼	
Value if output True/1	○ value 0	◉ value 1
ELSE (Condition is false)	○ not active	◉ active
Value if output False/0	◉ value 0	○ value 1

Figure 6: Universal Logic – ETS setting for the application example

5.1.1 Basic settings

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Condition 1: IF		
Text for condition 1	Any text (up to 25 characters allowed)	Description of the condition.
Select datapoint type for Input 1	■ **DPT 1.002 1 Bit boolean** ■ DPT 2.001 2 Bit switch control ■ DPT 17.001 1 Byte scene number ■ DPT 5.005 1 Byte decimal value (0...255) ■ DPT 5.001 1 Byte percent value (0...100 %) ■ DPT 6.010 1 Byte value (-128...127) ■ DPT 7.* 2 Byte unsigned value ■ DPT 8.* 2 Byte signed value ■ DPT 9.* 2 Byte floating value ■ DPT 12.* 4 Byte unsigned value ■ DPT 13.* 4 Byte signed value ■ DPT 14.* 4 Byte floating value ■ Time ■ Weekday	Setting the datapoint type for the input
Condition 2: AND		
The settings for “Condition 2” correspond to the parameters in “Condition 1”		
Condition 3: AND		
Condition 3: AND	■ **not active** ■ active	Determines whether the 3rd condition is used.
Text for condition 3	Any text (up to 25 characters allowed)	Description of the condition
Selection datapoint type for Input 1	■ **DPT 1.002 1 Bit boolean** ■ DPT 17.001 1 Byte scene number ■ DPT 5.005 1 Byte decimal value (0...255) ■ DPT 5.001 1 Byte percent value (0...100%)	Setting the datapoint type for the input
Condition 4: AND and Condition 5: OR		
The settings for “Condition 4” and “Condition 5” correspond to the parameters in “Condition 3”		

ETS Text	Dynamic range **[Default value]**	Comment
THEN (Condition is true)		
Selection datapoint type for output	▪ **DPT 1.002 1 Bit boolean** ▪ DPT 17.001 1 Byte scene number ▪ DPT 5.005 1 Byte decimal value (0...255) ▪ DPT 5.001 1 Byte percent value (0...100%)	Setting the datapoint type for the output
Value if output True/1	Selection according to the DPT output	Sends the value / scene number if the logic results in a "1".
ELSE (Condition is false)		
ELSE (Condition is false)	▪ **not active** ▪ active	Determines whether an alternative parameter should be sent if the logic function is "false".
Value if output false/0	Selection according to the DPT output	Sends the value / scene number if the logic results in a "0".
Lock / Release		
Lock / Enabling	▪ **not active** ▪ lock at value 1 ▪ enabling at value 1	Setting whether and when the value "1" lock or release the function.
Output value	▪ **hold** ▪ set to value for lock	Transmission behaviour of the lock. **Not if "lock / enabling" → "not active".**
Value for lock Scene number for lock	Selection according to the DPT output	Sends the value / scene number. **If "Output value" → "Set to value for lock".**
Sending condition		
Send condition	▪ **at change output** ▪ at input telegram	Setting when the output object should be transmitted.
Send to ... by telegram input	▪ **all input objects** ▪ Input 1 ▪ Input 1 comparative value ▪ Input 2 ▪ Input 2 comparative value ▪ Input 3 ▪ Input 4 ▪ Input 5 ▪ individual	Specifies the input objects for which a telegram is to be sent. **If "send condition" → "at input telegram".**

ETS Text	Dynamic range **[Default value]**	Comment
Input 1 - 5 Input 1/2 Comparative value	A check box appears for each activated input, which can be activated single	Selection of the inputs for which an input telegram is expected. **If "Send to ... by telegram input" → "individual".**
Filter output	▪ **not active** ▪ send only ON value ▪ send only OFF value	Filters which value is send.
Send delay / cyclical sending		
Send delay / cyclic sending	▪ **not active** ▪ send delay ▪ cyclical sending	Activates a delay or a cyclic telegram.
Time base	▪ **second** ▪ minute ▪ hour	Setting the time base.
Time	1 ... 240 s **[10 s]**	Setting the time value. Unit according to the time base.
Request inputs after reset	▪ **not active** ▪ active	Specifies whether and which input objects are actively requested after a reset.

Table 24: Settings – Universal Logic

Note: The logic or logic output does not send until all the used inputs are valid.

Send delay / cyclic sending
The send delay can be used to debounce the output. The output is only sent if the condition does not change during the delay time.

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Universal Logic Input 1	1 Bit 2 Bit 1 Byte 2 Byte 4 Byte	Condition 1 of the AND operation.
1	F1: – Universal Logic Input 1 – comparative value		Reference value for the first condition.
2	F1: – Universal Logic Input 2		Condition 2 of the AND operation.
3	F1: – Universal Logic Input 2 – comparative value		Reference value for the second condition.
4	F1: – Universal Logic Input 3	1 Bit 1 Byte	Condition 3 of the AND operation.
5	F1: – Universal Logic Input 4	1 Bit 1 Byte	Condition 4 of the AND operation.
6	F1: – Universal Logic Input 5	1 Bit 1 Byte	Condition 5 of the OR operation.
8	F1: – Universal Logic Lock	1 Bit	Lock object for the logic.
8	F1: – Universal Logic Enabling	1 Bit	Release object for the logic.
9	F1: – Universal Logic Output	1 Bit 1 Byte	Output object of logic function.
+10	**next function.**		

Table 25: Communication objects – Universal Logic

5.1.2 Settings for “DPT 1.002 boolean”

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
State equal	▪ **value 0** ▪ value 1	Comparative value for status at input.

Table 26: Settings – Universal Logic: „DPT 1.002 boolean“

If “boolean” is selected, the input object is compared with the set value range “value 0” or “value 1”. The result of this comparison is the result of the linking of the respective condition.

5.1.3 Settings for „DPT 2.001 2 Bit switch control“

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Value	▪ **00 - no priority, Off** ▪ 01 - no priority, On ▪ 10 - priority, Off ▪ 11 - priority, On	Comparison value for status at input.

Table 27: Settings – Universal Logic: „DPT 2.001 2 Bit switch control“

When this datapoint type is selected, the input object is used to request whether a channel is prioritised and whether the channel is locked or not locked. The result of the comparison between the input object and the “value” gives the result for the linking of the respective condition (“1” or “0”).

5.1.4 Settings for „DPT 17.001 scene number“

The following table shows the available settings when selecting the data point type “scene number”

ETS Text	Dynamic range **[Default value]**	Comment
Assessment	■ **equal** ■ unequal ■ greater than or equal ■ greater than ■ less than or equal ■ less than ■ between	Comparison condition for comparing the scene number with the input object.
Scene number	1 – 64 **[1]**	Scene number to be compared with
from scene number	1 – 64 **[1]**	Lowest scene number for the comparison **If „Assessment“ → „between“.**
to scene number	1 – 64 **[64]**	Highest scene number for the comparison **If „Assessment“ → „between“.**

Table 28: Settings – Universal Logic: „DPT 17.001 Scene number“

This datapoint type can be used to request which “scene number” has been written to an object. This scene number is compared with the set scene number, respectively with a scene number range, by a condition to be set under “Assessment”. The result of the comparison with the input object gives the result for the linking of the respective condition (“1” or “0”).

Note: The **“between”** rating is only available for conditions 1 and 2.

5.1.5 Settings for „DPT 5*-, 6*-, 7*-, 8*-, 9*-, 12*-, 13*-, 14* ...“

The following table shows the settings for selecting datapoint types:

- DPT 5.005 1 Byte decimal value (0...255)
- DPT 5.001 1 Byte percent value (0...100%)
- DPT 6.010 1Byte value (-128...127)
- DPT 7.* 2 Byte unsigned value
- DPT 8.* 2 Byte signed value
- DPT 9.* 2 Byte floating value
- DPT 12.* 4 Byte unsigned value
- DPT 13.* 4 Byte signed value
- DPT 14.* 4 Byte floating value

ETS Text	Dynamic range **[Default value]**	Comment
Assessment	▪ **equal** ▪ unequal ▪ greater than or equal ▪ greater than ▪ less than or equal ▪ less than ▪ between 2 comparables	Comparison condition for comparison with the input object
Comparative value via	▪ **object** ▪ parameter	Source of the comparison value. **If “Condition 1” and “Condition 2”, not if “Assessment” → “between 2 comparison values”.**
Comparative value	Selectable within the allowed range of the datapoint type	Comparison parameter for condition. **If “Comparative value via” → “parameter”.**
Preallocate second input with value	▪ **not active** ▪ active	Setting whether a pre-assignment is made. **If “Comparative value via” → “Object”.**
Value	Selectable within the allowed range of the datapoint type	Value for preassigning the comparison object. **If “Preallocate second input ...” → “active”.**
from to	Selectable within the allowed range of the datapoint type	Lower value and upper value for the comparison. **If “Assessment” → “between 2 comparables”.**

Table 29: Settings – Universal Logic: “DPT 5*-, 6*-, 7*-, 8*-, 9*-, 12*-, 13*-, 14* ...“

When comparing these data point types, the value in the input object is compared with a comparison value, whereby an evaluation is included. The result of the comparison with the group object yields the result for the linking of the respective condition (“1” or “0”).
For condition 1 and condition 2, the comparison value can be defined either via a set value or via an external object, which can be preset with a value depending on the allowed range of datapoint types.

Note: The **“between 2 comparables”** rating is only available for conditions 1 and 2.

5.1.6 Settings for „Time“

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Assessment	▪ **equal** ▪ unequal ▪ greater than or equal ▪ greater than ▪ less than or equal ▪ less than ▪ between 2 comparables	Comparison condition for comparison with the input object
hour	0 … 23 h **[0]**	Value for the time comparison.
minute	0 … 59 min **[0]**	
hour	0 … 23 h **[0]**	Value for the 2nd comparison value. **Only in case of “Assessment” → “between 2 comparables”.**
minute	0 … 59 min **[0]**	

Table 30: Settings – Universal Logic: „Time“

The data point type “time” can be selected for “Condition 1 IF” and “Condition 2 AND”. This function allows you to compare the current time with an editable time value or a time range. To use this function, the “Time” or “Date/Time” communication object must be connected to a time server. The result of the comparison provides the result for the link of the respective condition (“1” or “0”).

Note: The evaluation “between 2 comparables” is only available for conditions 1 and 2.

5.1.7 Settings for „Weekday“

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Assessment	■ **equal** ■ unequal ■ greater than or equal ■ greater than ■ less than or equal ■ less than ■ between 2 comparables	Comparison condition for comparison with the input object.
Weekday	■ **Monday** ■ Tuesday … ■ Sunday	Select the weekday for which the condition applies. **Not if “Assessment” → “between 2 comparatives**
from	■ **Monday** ■ Tuesday … ■ Sunday	Select the weekday on which the evaluation begins. **If “Assessment” → “between 2 comparatives“.**
to	■ **Monday** ■ Tuesday … ■ Sunday	Select the weekday on which the evaluation ends. **If “Assessment” → “between 2 comparatives“.**

Table 31: Settings – Universal Logic: „Weekday“

With “Condition 1 IF” and “Condition 2 AND”, the “Weekday”-datapoint type can be selected. This function can be used to compare the current day of the week with an adjustable day of the week or a range of days. To do this, the “Date” or “Date/Time” communication object must be connected to a time server. The result of the comparison provides the result for the link of the respective condition (“1” or “0”).

Note: The evaluation “between 2 comparables” is only available for conditions 1 and 2.

5.2 Logic gate / Inverter

The “Logic gate” function can be used to link up to 8 logic links with the conditions “AND”, “OR” and “XOR”. Both input conditions and the result of the logic operation (output condition) can be inverted.

The “Inverter” function allows to reverse (invert) and lock or release up to 4 objects.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Sub function	■ **Logic gate, 8 inputs with lock** ■ Logic inverter, 4x with lock	Selection of the sub function.

Table 32: Settings – Logic gate / Inverter

5.2.1 Logic gate, 8 inputs with lock

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Logic function	■ **AND** ■ OR ■ XOR	Selection of the logic gate.
Input 1 / 2	■ inactive ■ **active**	Setting to specify if the input is processed.
Polarity	■ **normal** ■ inverted	Enables an input inversion (0 → 1 or 1 → 0).
Object selection	■ **external object** ■ internal object	Definition of whether an internal or external object is linked.
Internal Object number	0 ... 255 **[0]**	Selection of the internal object number to be linked. **If “Object selection” → “internal object”.**
Input 3 (... 8)	■ **inactive** ■ active	Setting to specify if the input is processed.
Polarity	■ **normal** ■ inverted	Enables an input inversion (0 → 1 or 1 → 0).

ETS Text	Dynamic range **[Default value]**	Comment
Output	■ **normal** ■ inverted	Enables an output inversion (0 → 1 or 1 → 0).
Object type for output	■ **On/Off** ■ scene ■ value 0-255 ■ value 0-100 %	Selection of the object type for the result of the link.
Value if output True/1	Selectable within the allowed range of the datapoint type	Value that is sent when the output is "1". **Not if "Object type for output" → "On/Off".**
Value if output False/0	Selectable within the allowed range of the datapoint type	Value that is sent when the output is "0". **Not if "Object type for output" → "On/Off".**
Lock / Enabling	■ **not active** ■ lock at value 1 ■ enabling at value 1	Setting whether and when the value "1" lock or release the function.
Output value	■ **hold** ■ set to value for lock	Assigning what happens in the event of a lock /enabling. **Not if „Lock / Enabling" → „not active".**
Value for lock	Selectable within the allowed range of the datapoint type	Value that is given in the event of a lock. **If „Output Value" → „set to value for lock".**
Send condition	■ **at change output** ■ at input telegram	Determines when an output telegram is sent.
Send to ... by telegram input	■ **all input objects** ■ Input 1 ■ Input 2 ... ■ Input 8 ■ individual	Restricts the sending of telegrams for input objects. **Only for "send condition" → "at input telegram".**
Input 1 (...8)	A check box appears for each activated input, which can be activated individually	Select the inputs for which a transmission takes place. **Only for "Send to ... by telegram input" → "individual".**
Filter output	■ **not active** ■ send only ON value ■ send only OFF value	Filter condition for whether a transfer should only take place for "ON" values or only for "OFF" values of the link.
Send delay / cyclic sending	■ **not active** ■ send delay ■ cyclical sending	Activates a delay or a cyclic telegram.

ETS Text	Dynamic range **[Default value]**	Comment
Time base	▪ **second** ▪ minute ▪ hour	Setting the time base. **Not if "Send delay / cyclic sending" → "not active"**
Time	0 ... 240 **[10]**	Setting the time value. Unit according to the time base.
Request inputs after reset	▪ **not active** ▪ active	Specifies whether all inputs be requested after a reset.
The output sends only if all inputs are valid	▪ **not active** ▪ active ▪ preallocate inputs after reset	Setting the sending behaviour of the output object after a reset.
Input 1 (... 8)	▪ **value 0** ▪ value 1	Value with which the outputs are pre-assigned after a reset. **If „The output sends only if all inputs are valid" → „preallocate inputs after reset".**

Table 33: Settings – Logic gate: Logic gate, 8 inputs with lock

Logic functions

AND function			
The output is "1" if all inputs are 1.			
C	B	A	X
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

Table 34: Logic gate – AND - function

OR function			
The output is "1" if at least one input is "1".			
C	B	A	X
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	1

Table 35: Logic gate – OR - function

XOR function			
The output is "1" if only one input is "1".			
C	**B**	**A**	**X**
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	0

Table 36: Logic gate – XOR - function

Inverter function	
The output is "1" if the input is "0".	
A	**X**
0	1
1	0

Table 37: Logic gate – NOT - function

Object type "input-object"
With the "Logic gate" function, both "external objects" and "internal objects" can be linked. Internal objects" are objects generated in this logic module, such as logic results, time clocks or sunrise/sunset times. Linking with internal objects is only possible in this function for "Input 1" and "Input 2".

Object type "output-object"
The result of the link is written to an output object. This object can contain either a 1 Bit value or a 1 Byte value with predefined content. The "Lock/Enabling" function can be used to write a predefined value to the output object independently of the input objects "Input 1" up to "Input 8". The output object is sent by means of a "Send condition" when there is a "at change output" or "at input telegram". The sending condition can also be filtered so that only "OFF values" or only "ON values" trigger a telegram.

Send delay / cyclic sending
The send delay can be used to debounce the output. The output is only sent if the condition does not change during the delay time.

Behaviour on reset / bus failure
The input objects can be requested after a reset or bus failure. Depending on the setting, the output object is only sent when all inputs are valid assigned. It is possible to pre-assign the inputs up to receiving the input telegram.

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Logic Input 1	1 Bit	Input 1 for the logic operation.
1	F1: – Logic Input 2	1 Bit	Input 2 for the logic operation.
2	F1: – Logic Input 3	1 Bit	Input 3 for the logic operation.
3	F1: – Logic Input 4	1 Bit	Input 4 for the logic operation.
4	F1: – Logic Input 5	1 Bit	Input 5 for the logic operation.
5	F1: – Logic Input 6	1 Bit	Input 6 for the logic operation.
6	F1: – Logic Input 7	1 Bit	Input 7 for the logic operation.
7	F1: – Logic Input 8	1 Bit	Input 8 for the logic operation.
8	F1: – Logic Lock	1 Bit	Lock object for the logic.
8	F1: – Logic Enabling	1 Bit	Release object for the logic.
9	F1: – Logic Output	1 Bit 1 Byte	Output object for sending the result.
+10	**next function**		

Table 38: Communication objects – Logic gate: Logic gate, 8 inputs with lock

5.2.2 Logic inverter, 4x with lock

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Function	▪ **inverter** ▪ not invert (output = input)	Defines how the inverter works.
Inverter 1	**active**	Fixed preset value.
Inverter 2 (... 4)	▪ inactive ▪ **active**	Setting whether the object is processed.
Lock / Enabling	▪ **not active** ▪ lock at value 1 ▪ enabling at value 1	Setting whether and when the value "1" locks or releases the function.
Output value	▪ **hold** ▪ set to value for False/0 ▪ set to value for True/1	Definition of what happens to the output value in the event of a lock. **If „Lock/Enabling" is active.**

ETS Text	Dynamic range **[Default value]**	Comment
Send condition	▪ **at change output** ▪ at input telegram	Determines when a transfer takes place.
Filter output	▪ **not active** ▪ send only ON value ▪ send only OFF value	Restriction as to whether a transmission takes place at "ON" or "OFF" values.
Request inputs after reset	▪ **not active** ▪ active	Specifies whether all inputs are requested after a reset.
The output sends only if all inputs are valid	▪ **not active** ▪ active ▪ preallocate inputs after reset	Setting the sending behaviour of the output object after a reset.
Input Inverter 1 (... 4)	▪ **value 0** ▪ value 1	Value for pre-assigning the outputs are after a reset. **If „The output sends only if all inputs are valid" → „preallocate inputs after reset".**

Table 39: Settings – Logic Gate: Logic inverter, 4x with lock

Logic functions

Inverter function	
The output is "1" if the input is "0"	
A	**X**
0	1
1	0

Table 40: Logic inverter – NOT function

not invert function	
The output is "1" if the input is "1"	
A	**X**
0	0
1	1

Table 41: Logic inverter – NOT INVERT function

Object type "output-object"
Depending on the setting, the result of the function is written inverted or not inverted to an output object. This object has a 1 bit value. The "Lock/Release" function can be used to output a predefined value via the output object, regardless of the input object and the selected function.
The output object is sent by means of a "Sending condition" when there is a "at change output" or "at input telegram". The sending condition can also be filtered so that "only OFF values" or "only ON values" trigger a telegram.

Behaviour on reset / bus failure
The input objects can be requested after a reset or bus failure. Depending on the setting, the output object is only sent when all inputs are validly assigned. It is possible to pre-assign the inputs until the input telegram is received.

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Inverter input 1	1 Bit	Input object for inverter input 1
1	F1: – Inverter output 1	1 Bit	Output object for inverter output 1
2	F1: – Inverter input 2	1 Bit	Input object for inverter input 2
3	F1: – Inverter output 2	1 Bit	Output object for inverter output 2
4	F1: – Inverter input 3	1 Bit	Input object for inverter input 3
5	F1: – Inverter output 3	1 Bit	Output object for inverter output 3
6	F1: – Inverter input 4	1 Bit	Input object for inverter input 4
7	F1: – Inverter output 4	1 Bit	Output object for inverter output 4
8	F1: – Logic Lock	1 Bit	Lock object for the logic.
8	F1: – Logic Enabling	1 Bit	Release object for the logic.
+10	**next function**		

Table 42: Communication objects – Logic Gate: Logic inverter, 4x with lock

5.3 Send/request after reset

After a reset or a bus voltage failure, it may be necessary for objects to be requested or assigned a predefined value.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Value	▪ **request after reset** ▪ send after reset	Selection of the function direction Request = read, send = pre-allocate.
Datapoint type	▪ **DPT 1.002 1 Bit** ▪ DPT 2.001 2 Bit switch control ▪ DPT 3.007 4 Bit dimming control ▪ DPT 17.001 1 Byte scene number ▪ DPT 5.005 1 Byte decimal value (0...255) ▪ DPT 5.001 1 Byte percent value (0...100%) ▪ DPT 6.010 1 Byte value (-128...127) ▪ DPT 7.* 2 Byte unsigned value ▪ DPT 8.* 2 Byte signed value ▪ DPT 9.* 2 Byte floating value ▪ DPT 232.600 RGB value ▪ DPT 12.* 4 Byte unsigned value ▪ DPT 13.* 4 Byte signed value ▪ DPT 14.* 4 Byte floating value ▪ DPT 16.001 14 Byte text	Selection of the DPT for the function.
Value	Free selection within the permitted range of the datapoint type.	Compare parameters for condition. **If “value” → “send after reset”.**
Time base	▪ **second** ▪ minute	Setting the time base.
Delay after reset	1 ... 240 **[10]**	Setting the time value. Unit corresponding to the time base.

Table 43: Settings – Send/request after reset

Time base / Delay after reset
The adjustable “Time base” and the corresponding “Delay after reset” refer to a bus voltage failure or a reset on the logic module. Depending on the selected function, it may be useful to first send or read the object with a time delay so that other devices linked to the same group address are already in a defined status at this time.

The following table shows the associated communication objects:

<table>
<tr><th>No.</th><th>Name / Object function</th><th>Length</th><th>Usage</th></tr>
<tr><td>0</td><td>F1: – Send after reset</td><td rowspan="2">1 Bit
2 Bit
4 Bit
1 Byte
2 Byte
3 Byte
4 Byte
14 Byte</td><td>Selection of the object to be sent.</td></tr>
<tr><td>0</td><td>F1: – Request after reset</td><td>Selection of the object to be requested.</td></tr>
<tr><td>+10</td><td colspan="3">next function</td></tr>
</table>

Table 44: Communication objects – Send/request after reset

5.4 Save value and send after reset

This function is used to restore the value of an object after a reset or bus voltage failure.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Datapoint type	▪ **DPT 1.002 1 Bit** ▪ DPT 2.001 2 Bit switch control ▪ DPT 17.001 scene number ▪ DPT 5.005 1 Byte decimal value (0...255) ▪ DPT 5.001 1 Byte percent value (0...100 %) ▪ DPT 6.010 1 Byte value (-128...127) ▪ DPT 7.* 2 Byte unsigned value ▪ DPT 8.* 2 Byte signed value ▪ DPT 9.* 2 Byte floating value ▪ DPT 232.600 RGB value ▪ DPT 12.* 4 Byte unsigned value ▪ DPT 13.* 4 Byte signed value ▪ DPT 14.* 4 Byte floating value ▪ DPT 16.001 14 Byte text	Select the DPT to be restored after a bus failure or a reset.
Time base	▪ **second** ▪ minute	Setting the time base.
Send delay after reset	1 ... 240 **[1]**	Setting the time value. Unit corresponding to the time base.

Table 45: Settings – Save value and send after reset

Time base / Delay after reset
The adjustable "Time base" and the corresponding "Delay after reset" refer to a bus voltage failure or a reset on the logic module. Depending on the selected function, it may be useful to send or read the object with a time delay so that other devices, linked to the same group address are already in a defined status at this time.

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Send after reset		Selection of the object to be sent. DPT according to parameter setting
+10	**next function**		

Table 46: Communication objects – Save value and send after reset

5.5 Cyclic sending or request

This function is used if a communication object is to be requested cyclically or sent cyclically. This is important, for example, when using actuators and sensors that do not have the “send cyclic” function. It is also possible to use this function to send an output object with a fixed value cyclic.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Value	■ **request cyclic** ■ send cyclic	Setting whether a value is sent or requested cyclically.
Datapoint type	■ **DPT 1.002 1 Bit** ■ DPT 2.001 2 Bit switch control ■ DPT 3.007 4 Bit dimming Control ■ DPT 17.001 scene number ■ DPT 5.005 1 Byte decimal value (0...255) ■ DPT 5.001 1 Byte percent value (0...100 %) ■ DPT 6.010 1 Byte value (-128...127) ■ DPT 7.* 2 Byte unsigned value ■ DPT 8.* 2 Byte signed value ■ DPT 9.* 2 Byte floating value ■ DPT 232.600 RGB value ■ DPT 12.* 4 Byte unsigned value ■ DPT 13.* 4 Byte signed value ■ DPT 14.* 4 Byte floating value ■ DPT 16.001 14 Byte text	Select the DPT that is sent or requested cyclically.
If „Value“ → “request cyclic”		
Request all	■ **second** ■ minute ■ hour ■ only via object	Time base in which the cyclical request takes place.
Second Minute Hour	1 ... 240 **[10]**	Setting the time value. Unit according to the time base. **Not for “only via object”.**
If „Value“ → “send cyclic”		
Value selection	■ **fix value** ■ received value	Selection if a predefined value or the last received value is sent.
Value	■ **value 0** ■ value 1	Preset value to be sent. **If “Datapoint type” → “1 Bit” and “Value selection” → “fix value”**

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ETS Text	Dynamic range **[Default value]**	Comment
Value	0 … 255 0 … 100 % -128 … 127 0 … 65535 -32768 … 32767 -670670 … 670670 0 … 4294967295 -2147483648 … 2147483647 -3,4E+38 … 3,4E+38	Preset value that is being sent. Value corresponding to the selected DPT. **If "Value selection" → "fix value" and not "Datapoint type" → "1 Bit".**
Send all	▪ **second** ▪ minute ▪ hour	Setting the time base.
Second Minute Hour	0…240 **[10]**	Setting the time value. Unit according to the time base
Lock/Release		
Lock / Enabling	▪ **not active** ▪ lock at value 1 ▪ enabling at value 1	Setting whether and when the value "1" lock or release the function.

Table 47: Settings – Cyclic sending or request

Request cyclic
With the "Request cyclic" function, the associated communication object is requested in the rhythm set under "Request all".
If the "Request all" parameter is set to "Only via object", the communication object is only requested when triggered by the "Request requirement" communication object.

Send cyclic
With this function, the following is executed at the rhythm set under "Send all":

- **"Value selection" → "Fix value**:
  The parameter set under "Value" is sent cyclically.
- **"Value selection" → "received value":**
  The value received by the communication object is returned cyclically.

Note: To start the cyclical transmission, the communication object must be in a defined state. This means that a valid telegram must have been received.

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Request value cyclic		Request the object to be sent or requested. DPT according to parameter setting.
0	F1: – Send value cyclic		
0	F1: – Receive value and send cyclic		
7	F1: – Request requirement	1 Bit	Start a one-off object request.
8	F1: – Logic Lock	1 Bit	Lock object for the logic.
8	F1: – Logic Enabling	1 Bit	Release object for the logic.
+10	**next function**		

Table 48: Communication objects – Cyclic sending or request

5.6 Monitoring of telegrams

This function is used to monitor if a communication object is sent cyclical. If no suitable telegram is received within the monitoring time, a fault message is issued. An “OK - Message” can be issued when the telegram is received again. The monitoring time can be set.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Datapoint type	■ **DPT 1.002 1 Bit** ■ DPT 2.001 2 Bit switch control ■ DPT 3.007 4 Bit dimming control ■ DPT 17.001 1 Byte scene number ■ DPT 5.005 1 Byte decimal value (0...255) ■ DPT 5.001 1 Byte percent value (0...100 %) ■ DPT 6.010 1 Byte value (-128...127) ■ DPT 7.* 2 Byte unsigned value ■ DPT 8.* 2 Byte signed value ■ DPT 9.* 2 Byte floating value ■ DPT 232.600 RGB value ■ DPT 12.* 4 Byte unsigned value ■ DPT 13.* 4 Byte signed value ■ DPT 14.* 4 Byte floating value ■ DPT 16.001 14 Byte text	Selection of the datapoint type for the monitoring of telegrams.
Valid state of monitoring	■ **On or Off** ■ only On ■ only Off	Filter function for which 1-bit values are identified as valid telegrams. **If “Datapoint type” → “1 Bit”**.
Time base	■ **second** ■ minute ■ hour	Setting the time base.
Monitoring time	1 ... 240 s **[60 s]** 1 ... 240 min **[60 min]** 1 ... 240 h **[1 h]**	Setting the time value. Unit and standard value corresponding to the time base.

ETS Text	Dynamic range **[Default value]**	Comment
In the event of a telegram failure		
Setting of DPT for message	▪ **DPT 1.002 Ein/Aus** ▪ DPT 2.001 2 Bit switch control ▪ DPT 17.001 scene number ▪ DPT 5.005 1 Byte decimal value (0...255) ▪ DPT 5.001 1 Byte percent value (0...100%) ▪ DPT 16.001 14 Byte text	Selection of the datapoint type for the message output.
Send with failure	▪ value 0 ▪ **value 1**	Selectable values for “1 Bit”. **If „Setting of DPT for message“ → „On/Off“**
Send with failure	▪ **00 - no priority, Off** ▪ 01 - no priority, On ▪ 10 - priority, Off ▪ 11 - priority, On	Selectable values for “switch control”. **If „Setting of DPT for message“ → „2 Bit switch control“**
Send scene number with failure	1 – 64 **[1]**	Selectable values for “scene number”. **If „Setting of DPT for message“ → „scene number“**
Send value with failure	0 ... 255 **[0]**	Selectable values for “decimal value”. **If „Setting of DPT for message“ → „1 Byte decimal value“**
Send percent value with failure	0 – 100 % **[0 %]**	Selectable values for “percent value”. **If „Setting of DPT for message“ → „1 Byte percent value“**
Send text with failure	Any text (up to 14 characters allowed)	Text for displaying in the event of an error message. **If „Setting of DPT for message“ → „14 Byte Text“**
Send if OK with failure	▪ **not active** ▪ active	Enable to send a confirmation on telegram return.
Value Scene number Percent value Text	DPT according to “DPT setting for message”	Sent by receiving a telegram after failure.

Table 49: Settings – Monitoring of telegrams

Valid status for monitoring
The “DPT 1.* 1Bit” datapoint type allows the logic value to be filtered. This defines a telegram as valid and received if the object value is either “0” or “1”.

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Telegram monitoring Input		Selection of the communication object for which the telegrams are to be monitored. DPT according to parameter setting.
4	F1: – Telegram monitoring Message	1 Bit 2 Bit 1 Byte 14 Byte	Output of a message if a telegram was not sent or has returned.
+10	**next function**		

Table 50: Communication objects – Monitoring of telegrams

5.7 Scene controller / Control table

The Scene controller / Control table function can be used to evaluate the status of up to 7 1 Bit objects. In opposite to the AND operation of the logic gate, each of the 7 objects can be evaluated to the status “0”, “1” or “no evaluation”.
A fixed output value is issued depending on a condition defined in the control table format. Up to 8 conditions can be defined.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Number of inputs	2 – 7 **[2]**	Specifies how many inputs are requested.
Description for input 1 (... 7)	any text (up to 25 characters allowed)	Editable text describing the relevant input.
Object type for output	▪ On/Off ▪ **scene** ▪ value 0-255 ▪ value 0-100%	Selection of the DPT for the output value.
Condition 1 ... 8		
Control table Condition 1 (... 8)	▪ not active ▪ **active**	Specifies whether condition 1 is active.
Condition 1 (highest priority) (... 8)	▪ **0XXXXXX** ▪ ... ▪ 1111111	0= Value 0; 1= Value 1; x= no evaluation Condition 1 has the highest priority. Explanation below this table.
Output value if true	▪ **value 0** ▪ value 1	Define the output object value if the condition is “True”. **If „Object type for output“ → „On/Off“**
Scene number if true	1 – 64 **[1]**	Define the output scene number if the condition is “True”. **If „Object type for output“ → „Scene number“**
Output value if true	0 ... 255 **[0]**	Define the output object value if the condition is “True”. **If „Object type for output“ → „Value 0-255“**
Output value if true	0 – 100 % **[0 %]**	Define the output object value if the condition is “True”. **If „Object type for output“ → „Value 0-100 %“**
Lock / Enabling	▪ **not active** ▪ lock at value 1 ▪ enabling at value 1	Setting whether and when the value “1” lock or release the function.

ETS Text	Dynamic range **[Default value]**	Comment
Output value	■ **hold** ■ set to value for lock	Behaviour of the output object in the event of a lock / release.
Value for lock	■ **value 0** ■ value 1 1 – 64 **[1]** 0 ... 255 **[0]** 0 – 100% **[0 %]**	Specification of the output object value if the lock / Release is “1”. Depending on the DPT “Output object type” **Only for “Output value” → “Set to value for lock”.**
Send condition	■ **at change output** ■ at input telegram	Determines when an output object is transmitted.
Send to ... by telegram input	■ **all input objects** ■ input 1 ■ input 2 ■ ... ■ input 7 ■ individual	This restricts the telegram transmission for input objects. **If “Send condition” → “at input telegram”.**
Input 1 (... 7)	■ ☐ ■ ☑	Individual selection of the input object if its change the output object is sent. **If “Send on telegram input on” → “individual”.**
Send delay / cyclic sending	■ **not active** ■ send delay ■ cyclical sending	Enables the delay or cyclical sending of the output object.
Time base	■ **second** ■ minute ■ hour	Setting the time base.
Time	0 ... 240 **[10]**	Setting the time value. Unit corresponding to the time base.
Request inputs after reset	■ **not active** ■ active	Defines whether all inputs should be requested after a reset.
The output sends only if all inputs are valid	■ **not active** ■ active ■ preallocate inputs after reset	Setting the sending behaviour of the output object after a reset.
Input 1 (... 7)	■ **value 0** ■ value 1	Value for initializing the outputs after a reset. **If “The output sends only if all inputs are valid” → “preallocate inputs after reset”.**

Table 51: Setting – Scene controller / Control table

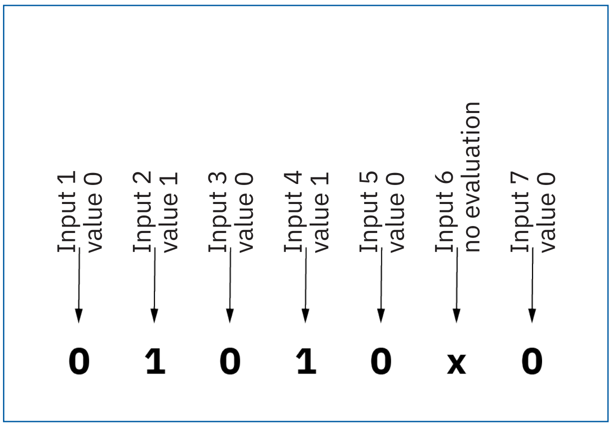


Figure 7: Scene control – Determination of the condition field

Condition 1 to condition 8
A 7-digit number sequence is entered in the Condition 1 (... 8) field. The first digit of the number sequence refers to input 1, the second digit to input 2 and so on.
Valid values are "0" for "value 0", "1" for "value 1" and "X" for "no evaluation"
The priority of the inputs ranges from input 1 (highest priority) to input 7 (lowest priority).

Object type "output-object"
The result of the logic operation is written to an output object. This object can be a 1 Bit value or a 1 Byte value with predefined value. The value that is sent when a condition is fulfilled is defined in the **"Output value if true"** parameter of each single condition.
The output object is sent via a **"Send condition"** when there is a "at change output" or "at input telegram" in the current link. You can also select which inputs cause the output object to be sent.
Using the **"Lock/Release"** function, a predefined value can be output via the output object when the lock is activated, regardless of the input objects for "Input 1" up to "Input 7".

Send delay / cyclic sending
The send delay can be used to debounce the output. The output is only sent if the condition does not change during the delay time.

Behaviour on reset / bus failure
The input objects can be requested after a reset or bus failure.
Depending on the setting, the output object is only sent when all inputs are validly assigned.
It is possible to pre-assign the inputs up to receipt of the input telegrams.

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Scene control Input 1	1 Bit	Input for the 1st bit of the condition.
1	F1: – Scene control Input 2	1 Bit	Input for the 2nd bit of the condition.
2	F1: – Scene control Input 3	1 Bit	Input for the 3rd bit of the condition.
3	F1: – Scene control Input 4	1 Bit	Input for the 4th bit of the condition.
4	F1: – Scene control Input 5	1 Bit	Input for the 5th bit of the condition.
5	F1: – Scene control Input 6	1 Bit	Input for the 6th bit of the condition.
6	F1: – Scene control Input 7	1 Bit	Input for the 7th bit of the condition.
8	F1: – Logic Lock	1 Bit	Lock object.
8	F1: – Logic Enabling	1 Bit	Release object.
9	F1: – Logic Output	1 Bit 1 Byte	Output object, sends the specified value if the condition is fulfilled.
+10	**next function**		

Table 52: Communication objects – Scene controller / Control table

5.8 Multiplexer / Partition control

This function allows you to link up to two pairs of inputs so that the value of an object only affects one or both output objects.
The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Mode for Object 1 and 2	■ **DPT 1.002 On/OFF** ■ DPT 2.001 2 Bit switch control ■ DPT 3.007 4 Bit dimming control ■ DPT 5.005 1 Byte decimal value (0...255) ■ DPT 5.001 1 Byte percent value (0...100%) ■ DPT 9.* 2 Byte floating value ■ DPT 17.001 scene number	Selection of the DPT for object 1 and object 2.
Mode for Object 3 and 4	■ **not active** ■ DPT 1.002 1 Bit On/Off ■ DPT 2.001 2 Bit switch control ■ DPT 3.007 4 Bit dimming control ■ DPT 5.005 1 Byte decimal value (0...255) ■ DPT 5.001 1 Byte percent value (0...100%) ■ DPT 9.* 2 Byte floating value ■ DPT 17.001 scene number	Selection of the DPT for object 3 and object 4.
Not if „Mode for Object 3 and 4“ → „not active“		
Multiplexer if control input = 0	■ **Object 1 ‖ Object 2, Object 3 ‖ Object 4** ■ Object 1 => Object 2, Object 3 => Object 4 ■ Object 1 <= Object 2, Object 3 <= Object 4 ■ Object 1 <=> Object 2, Object 3 <=> Object 4 ■ Object 1 => Object 2, Object 3 ‖ Object 4 ■ Object 1 <= Object 2, Object 3 ‖ Object 4 ■ Object 1 ‖ Object 2, Object 3 => Object 4 ■ Object 1 ‖ Object 2, Object 3 <= Object 4	Selection of the function at Control input = 0.
Multiplexer if control input = 1	■ **Object 1 ‖ Object 2, Object 3 ‖ Object 4** ■ Object 1 => Object 2, Object 3 => Object 4 ■ Object 1 <= Object 2, Object 3 <= Object 4 ■ Object 1 <=> Object 2, Object 3 <=> Object 4 ■ Object 1 => Object 2, Object 3 ‖ Object 4 ■ Object 1 <= Object 2, Object 3 ‖ Object 4 ■ Object 1 ‖ Object 2, Object 3 => Object 4 ■ Object 1 ‖ Object 2, Object 3 <= Object 4	Selection of the function at Control input = 1.

ETS Text	Dynamic range **[Default value]**	Comment
If „Mode for Object 3 and 4“ → „not active“		
Multiplexer if control input = 0	▪ **Object 1 ǁ Object 2 (independent)** ▪ Object 1 => Object 2 ▪ Object 1 <= Object 2 ▪ Object 1 <=> Object 2	Selection of the function at Control input = 0.
Multiplexer if control input = 1	▪ **Object 1 ǁ Object 2 (independent)** ▪ Object 1 => Object 2 ▪ Object 1 <= Object 2 ▪ Object 1 <=> Object 2	Selection of the function at Control input = 1.
Lock / Enabling	▪ **not active** ▪ lock at value 1 ▪ enabling at value 1	Setting whether and when the value “1” locks or release the function.

Table 53: Setting – Multiplexer / Partition control

Operating description of multiplexer functions

Object A ǁ Object B
Object A is treated separately from object B.

Action object	Reaction Object A	Reaction Object B
Change object A.	Accepts the change.	Ignores the change.
Change object B.	Ignores the change.	Accepts the change.

Table 54: Multiplexer function – Object A ǁ Object B

Object A => Object B
Object A acts on object B, but object B does not act on object A.

Action object	Reaction Object A	Reaction Object B
Change object A.	Accepts the change.	Accepts the change.
Change object B.	Ignores the change.	Accepts the change.

Table 55: Multiplexer function – Object A => Object B

Object A <= Object B:
Object A does not affect object B, but object B does act on object A.

Action object	Reaction Object A	Reaction Object B
Change object A.	Accepts the change.	Ignores the change.
Change object B.	Accepts the change.	Accepts the change.

Table 56: Multiplexer function – Object A <= Object B

Object A <=> Object B
Object A acts on object A and object B, object B acts on object A and object B.

Action object	Reaction Object A	Reaction Object B
Change object A.	Accepts the change.	Accepts the change.
Change object B.	Accepts the change.	Accepts the change.

Table 57: Multiplexer function – Object A <= Object B

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Multiplexer Input/Output 1	1 Bit 2 Bit 4 Bit 1 Byte 2 Byte	Input and output function for multiplexer object 1.
1	F1: – Multiplexer Input/Output 2		Input and output function for multiplexer object 2.
3	F1: – Multiplexer Input/Output 3		Input and output function for multiplexer object 3.
4	F1: – Multiplexer Input/Output 4		Input and output function for multiplexer object 4.
4	F1: – Multiplexer Control input	1 Bit	Control input for switching the multiplexer function.
8	F1: – Logic Lock	1 Bit	Lock object.
8	F1: – Logic Enabling	1 Bit	Release object.
+10	**next function**		

Table 58: Communication objects – Multiplexer / Partition control

5.9 Telegram multiplier / sequencer

With the multiplier/sequencer function, it is possible to write up to 4 outputs with pre-assigned values if a condition is fulfilled (on/off or scene number). The 4 outputs can have different DPTs.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Input datapoint type	■ **On/Off** ■ DPT 17.001 (scene number)	Selection of the DPT to start the function.
Valid scene number	1 – 64 **[1]**	Setting the scene number to start the Telegram multiplier / sequencer. **If "Input datapoint type" → "Scene number".**
Output 1 (... 4)	■ not active ■ **active**	Activation of output 1. **If "Input datapoint type" → "scene number".**
Output 1 (... 4) sends	■ **not active** ■ if input Off ■ if input On ■ if input On or Off	Sending condition for output 1. **If "Input datapoint type" → "On/ Off".**
Datapoint type	■ **DPT 1.001 On/Off** ■ DPT 2.001 2Bit switch control ■ DPT 17.001 scene number ■ DPT 5.005 1 Byte Decimal value (0...255) ■ DPT 5.001 1 Byte percent value (0...100 %) ■ DPT9.001 temperature value	Selection of the DPT with which the output is 1 to send.
If "Datapoint type" → „DPT 1.001 On/Off"		
Value if input OFF	■ **value 0** ■ value 1	Content of the output object if the input object is "OFF". **Not if "Output 1 sends" → "if input On".**
Value if input ON	■ value 0 ■ **value 1**	Content of the output object if the input object is "ON". **Not if "Output 1 sends" → "if input Off".**

ETS Text	Dynamic range **[Default value]**	Comment
If "Datapoint type" → „DPT 2.001 2 Bit switch control"		
Value if input OFF	▪ **00 - no priority, Off** ▪ 01 - no priority, On ▪ 10 - priority, Off ▪ 11 - priority, On	Content of the output object if the input object is "OFF". **Not if "Output 1 sends" → "if input On".**
Value if input ON	▪ 00 - no priority, Off ▪ 01 - no priority, On ▪ 10 - priority, Off ▪ **11 - priority, On**	Content of the output object if the input object is "ON". **Not if "Output 1 sends" → "if input Off".**
If "Datapoint type" → „DPT 17.001 scene number"		
Scene number if input OFF	1 – 64 **[1]**	Content of the output object if the input object is "OFF". **Not if "Output 1 sends" → "if input On".**
Scene number if input ON	1 – 64 **[2]**	Content of the output object if the input object is "ON". **Not if "Output 1 sends" → "if input Off".**
If "Datapoint type" → „DPT 5.005 1 Byte value (0 … 255)"		
Value if input OFF	0 … 255 **[0]**	Content of the output object if the input object is "OFF". **Not if "Output 1 sends" → "if input On".**
Value if input ON	0 … 255 **[255]**	Content of the output object if the input object is "ON". **Not if "Output 1 sends" → "if input Off".**
If "Datapoint type" → „DPT 5.001 1 Byte percent value (0 … 100%)"		
Value if input OFF	0 – 100 % **[0 %]**	Content of the output object if the input object is "OFF". **Not if "Output 1 sends" → "if input On".**
Value if input ON	0 – 100 % **[100 %]**	Content of the output object if the input object is "ON". **Not if "Output 1 sends" → "if input Off".**

ETS Text	Dynamic range **[Default value]**	Comment
If "Datapoint type" → „DPT 9.001 temperature value"		
Value if input OFF	-670760 ... 670760 °C **[0 °C]**	Content of the output object if the input object is "OFF". **Not if "Output 1 sends" → "if input On".**
Value if input ON	-670760 ... 670760 °C **[0 °C]**	Content of the output object if the input object is "ON". **Not if "Output 1 sends" → "if input Off"**.
Lock / Release		
Lock / Enabling	▪ **not active** ▪ lock at value 1 ▪ enabling at value 1	Setting whether and when the value "1" lock or release the function.

Table 59: Setting – Telegram multiplier / sequencer

Function description:
If the "sequencer input" object corresponds to the set condition, the sending of outputs 1 (... 4) is triggered. If the "sequencer input" has the datapoint type "On/Off", you can set whether the triggering of sequencer outputs 1 (... 4) should take place "if input On", "if input Off" or "if input On or Off". In the case of the sending condition "if input On or Off", there is a parameter for both the **"On"**-condition and the **"Off"**-condition.

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Sequencer Input	1 Bit 1 Byte	Trigger input for starting the output.
1	F1: – Sequencer Output 1	1 Bit 2 Bit 1 Byte 2 Byte	Output 1 for data output.
2	F1: – Sequencer Output 2		Output 1 for data output.
3	F1: – Sequencer Output 3		Output 1 for data output.
4	F1: – Sequencer Output 4		Output 1 for data output.
8	F1: – Logic Lock	1 Bit	Lock object for the logic.
8	F1: – Logic Enabling	1 Bit	Release object for the logic.
+10	**next function**		

Table 60: Communication objects – Telegram multiplier / sequencer

5.10 Universal calculator

The Universal calculator can be used to execute calculation functions. Objects and fixed values can be added, divided, multiplied and subtracted from each other.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Calculation output 1		
Operation	■ **input 1 + input 2** ■ input 1 - input 2 ■ input 1 * input 2 ■ input 1 / input 2	Selection of the calculation function for output 1.
Input 1 /2	■ **object** ■ fix value ■ fix percent value	Selection of the calculation object type.
Datapoint type	■ **DPT 1.002 boolean** ■ DPT 5.005 1 Byte decimal value (0…255) ■ DPT 5.001 1 Byte percent value (0…100%) ■ DPT 6.010 1 Byte value (-128…127) ■ DPT 7.* 2 Byte unsigned value ■ DPT 8.* 2 Byte signed value ■ DPT 9.* 2 Byte floating value ■ DPT 12.* 4 Byte unsigned value ■ DPT 13.* 4 Byte signed value ■ DPT 14.* 4 Byte floating value	Selection of the datapoint type **If "Input 1" → "Object".**
Value	-3,4E+38 … 3,4E+38 **[0]**	Selection of a value. **If "Input 1" → "fix value".**
Percent value	0 – 100 % **[0 %]**	Selection of a percent value. **If "Input 1" → "fix percent value".**

ETS Text	Dynamic range **[Default value]**	Comment
Output 1		
Datapoint type for output	■ **DPT 1.002 boolean** ■ DPT 5.005 1 Byte decimal value (0...255) ■ DPT 5.001 1 Byte percent value (0...100%) ■ DPT 6.010 1 Byte value (-128...127) ■ DPT 7.* 2 Byte unsigned value ■ DPT 8.* 2 Byte signed value ■ DPT 9.* 2 Byte floating value ■ DPT 12.* 4 Byte unsigned value ■ DPT 13.* 4 Byte signed value ■ DPT 14.* 4 Byte floating value	Selection of the datapoint type in the format of which the output object is written.
Calculation output 2		
Output 2	■ **not active** ■ active	Enabling of the calculation output 2
Operation	■ **input 3 + input 4** ■ input 3 - input 4 ■ input 3 * input 4 ■ input 3 / input 4	Selection of the calculation function for output 2.
Input 3 / 4		
Input 3 / 4	■ **object** ■ fix value ■ fix percent value ■ output 1	Selection of the calculation object type.
Datapoint type	■ **DPT 1.002 boolean** ■ DPT 5.005 1 Byte decimal value (0...255) ■ DPT 5.001 1 Byte percent value (0...100%) ■ DPT 6.010 1 Byte value (-128...127) ■ DPT 7.* 2 Byte unsigned value ■ DPT 8.* 2 Byte signed value ■ DPT 9.* 2 Byte floating value ■ DPT 12.* 4 Byte unsigned value ■ DPT 13.* 4 Byte signed value ■ DPT 14.* 4 Byte floating value	Selection of the datapoint type **If “Input 3 / 4” → “Object”.**
Value	-3,4E+38 .... 3,4E+38 **[0]**	Selection of a predefined value for input 3 / 4. **If “Input 3 / 4” → “fix value”.**

ETS Text	Dynamic range **[Default value]**	Comment
Percent value	0 – 100 % **[0 %]**	Selection of a predefined percent value for input 3 / 4. **If "Input 3 / 4" → "fix percent value".**
Calculation output 3		
Output 3	▪ **not active** ▪ active	Selection of if calculation function 3 is used.
Operation	▪ **output 1 + output 2** ▪ output 1 - output 2 ▪ output 1 * output 2 ▪ output 1 / output 2	Selection of the calculation function for output 3.
Datapoint type	▪ **DPT 1.002 boolean** ▪ DPT 5.005 1 Byte decimal value (0...255) ▪ DPT 5.001 1 Byte percent value (0...100%) ▪ DPT 6.010 1 Byte value (-128...127) ▪ DPT 7.* 2 Byte unsigned value ▪ DPT 8.* 2 Byte signed value ▪ DPT 9.* 2 Byte floating value ▪ DPT 12.* 4 Byte unsigned value ▪ DPT 13.* 4 Byte signed value ▪ DPT 14.* 4 Byte floating value	Selection of the datapoint type in the format of which the output 3 object is written.
Lock / Release		
Lock / Enabling	▪ **not active** ▪ lock at value 1 ▪ enabling at value 1	Setting whether and when the value "1" lock or release the function.
Sending conditions		
Send condition	▪ **at change output** ▪ at input telegram ▪ not automatic	Sending condition for sending an output telegram.
Send by impulse input	▪ send all outputs by OFF ▪ **send all outputs by ON** ▪ send output 1 by OFF and output 2 by ON ▪ send output 2 by OFF and output 1 by ON	Sending of outputs triggered by an input telegram when the set condition is reached.
Send delay / cyclic sending	▪ **not active** ▪ send delay ▪ cyclical sending	Selection if the outputs are sent cyclically or delayed.

ETS Text	Dynamic range **[Default value]**	Comment
Time base	▪ **second** ▪ minute ▪ hour	Setting the time base.
Time	1 … 240 **[10]**	Setting the time value. Unit according to the time base.
Behaviour after reset		
Request inputs after reset	▪ **not active** ▪ active	Behaviour of the inputs after a reset.
The output sends only if all inputs are valid	▪ **not active** ▪ active	Sending condition for outputs after a reset.

Table 61: Setting – Universal calculator

Calculation of output 1 and 2
The “Operation” parameter is used to specify how inputs 1 (3) and 2 (4) are to be calculated with each other. The calculation functions “addition”, “multiplication”, “division” and “subtraction” are available. The “Input” parameter is used to specify if a communication object or “a fixed value” is used as the basis for the calculation. A separate “Fixed percentage value” parameter is available for the “Percent” calculation. For output 2, it is also possible to select the result from calculation 1 (“output 1”) as the basis.

Calculation of output 3
For output 3, the “Operation” parameter is used to select how the results of the “Output 1” and “Output 2” are to be calculated. “Addition”, “multiplication”, “division” and “subtraction” are also available here.

Note: When using calculations of the type “Percent”, the following peculiarity should be noted: Due to the 1-Byte data model, rounding errors may occur. For example, the calculation 14% + 7% does not exactly equal 21%, but 21.2%. If the result is converted back into a percent value, commercial rounding is performed – this means that values with a decimal place of 0.5 or higher are rounded up.

Lock / release
A lock object or an release object can be used to “lock” or “release” the function and the related output of the output objects.

Sending output objects
The “Sending condition” parameter can be used to specify if this output is only written when there is a “change to the output” (i.e. only output 1 when there is a change to output 1) or if all outputs are rewritten when a new “input telegram” is received.
Another communication object “Universal calculator Impulse input” can be used to trigger the sending of the outputs.

A differentiation can be made here between:

- **Send all outputs when OFF:**
  When the communication object changes from “1” to “0”, all outputs are sent.
- **Send all outputs with ON:**
  When the communication object changes from “0” to” 1”, all outputs are sent.
- **Send output 1 with OFF and output 2 with ON:**
  When the communication object changes from “1” to “0”, output 1 and output 3 are sent; changing from “0” to “1” causes output 2 and output 3 to be sent.
- **Send output 2 when OFF and output 1 when ON:**
  When the communication object changes from “1” to “0”, output 2 and output 3 are sent, the change from “0” to “1” causes output 1 and output 3 to be sent.

Behaviour after reset
After a reset or a bus failure, all inputs are requested subject to the setting.
Sending the outputs can also be restricted so that outputs only send when all inputs of the respective output have been received with a valid value.

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Universal calculator Input 1	1 Bit 1 Byte 2 Byte 4 Byte	Input 1 of the Calculator.
1	F1: – Universal calculator Input 2		Input 2 of the Calculator.
2	F1: – Universal calculator Input 3		Input 3 of the Calculator.
3	F1: – Universal calculator Input 4		Input 4 of the Calculator.
4	F1: – Universal calculator Output 1		Output 1 of the calculator.
5	F1: – Universal calculator Output 2		Output 2 of the calculator.
6	F1: – Universal calculator Output 3		Output 3 of the calculator.
7	F1: – Universal calculator Impulse input	1 Bit	Trigger input for sending values.
8	F1: – Logic Lock	1 Bit	Lock object for the logic.
8	F1: – Logic Enabling	1 Bit	Release object for the logic.
+10	**next function**		

Table 62: Communication objects – Universal calculator

5.11 Converting of datapoint types

The converting of datapoint types function provides a wide range of options for converting, editing and preallocating various datapoint types.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Function	■ **1 Bit => 1 Byte value 0-255** ■ 1 Bit => 1 Byte value 0-100% ■ 1 Bit => 2 Byte temperature value ■ 1 Bit => 2 Byte float value ■ 1 Bit => 14 Byte text ■ 2 x 1 Bit => 2 Bit control ■ 8 x 1 Bit => 1 Byte ■ 2 Bit control => 2 x 1 Bit ■ 1 Byte value 0-255 => 1 Bit ■ 1 Byte value 0-100% => 1 Bit ■ 1 Byte => 8 x 1 Bit ■ 1 Byte inverted 0 => 255 / 255 => 0 ■ 2 x 1 Byte => 2 Byte ■ 3 x 1 Byte => 3 Byte ■ 4 x 1 Byte => 4 Byte ■ 2 Byte temperature value => 1 Bit ■ 2 Byte float value => 1 Bit ■ 2 Byte => 2 x 1 Byte ■ 3 Byte => 3 x 1 Byte ■ 4 Byte => 4 x 1 Byte ■ 14 Byte text => Bit / Byte ■ universal (1 Bit - 4 Byte)	Selection of the format to be converted. More detailed information for each functions can be found in chapters 5.11.1 up to 5.11.22.
Send condition	■ at change output ■ **at input telegram**	Defines when a telegram is to transmitted.
Lock / Enabling	■ **not active** ■ lock at value 1 ■ enabling at value 1	Setting whether and when the value “1” lock or release the function.

Table 63: Setting – Converting of datapoint types

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
8	F1: – Logic Lock	1 Bit	Lock object for the logic.
8	F1: – Logic Enabling	1 Bit	Release object for the logic.
+10	**next function**		

Table 64: Communication objects – Converting of datapoint types: Lock / Release objects

5.11.1 Settings for „1 Bit => 1 Byte value 0 – 255“

This function can be used to set a fixed value between 0 and 255 for signal status “0” and a fixed value for signal status “1” to a 1 bit object. Alternatively, by using a control input, 2 other values can be output.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Control input 1	▪ **not active** ▪ active	Providing the control input in which a second set of values is used.
If „Control input“ → „not active“		
Output value if input = 0	0 ... 255 **[0]**	Setting of the value to be output.
Output value if input = 1	0 ... 255 **[0]**	Setting of the value to be output.
If „Control input“ → „active“		
Output value if input = 0 and control input = 0	0 ... 255 **[0]**	Setting of the value to be output.
Output value if input = 1 and control input = 0	0 ... 255 **[0]**	Setting of the value to be output.
Output value if input = 0 and control input = 1	0 ... 255 **[0]**	Setting of the value to be output.
Output value if input = 1 and control input = 1	0 ... 255 **[0]**	Setting of the value to be output.

Table 65: Setting – Converting of datapoint types: „1 Bit => 1 Byte value 0 – 255“

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Format converter Input	1 Bit	Input object.
1	F1: – Format converter Control Input	1 Bit	Control input (shift function)
4	F1: – Format converter Output	1 Byte	Output of one of the four set values.
+10	**next function**		

Table 66: Communication objects – Converting of datapoint types: „1 Bit => 1 Byte value 0 – 255“

5.11.2 Settings for „1 Bit => 1 Byte value 0 – 100%“

This function can be used to set a fixed value between 0 and 100 % for signal status “0” and a fixed value for signal status “1” to a 1 Bit object. Alternatively, by using a control input, 2 other values can be output.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Control input 1	▪ **not active** ▪ active	Activating the control input in which a second set of values is used.
If „Control input“ → „not active“		
Output value if input = 0	0 – 100 % **[0 %]**	Setting of the value to be output.
Output value if input = 1	0 – 100 % **[0 %]**	Setting of the value to be output.
If „Control input“ → „active“		
Output value if input = 0 and control input = 0	0 – 100 % **[0 %]**	Setting of the value to be output.
Output value if input = 1 and control input = 0	0 – 100 % **[0 %]**	Setting of the value to be output.
Output value if input = 0 and control input = 1	0 – 100 % **[0 %]**	Setting of the value to be output.
Output value if input = 1 and control input = 1	0 – 100 % **[0 %]**	Setting of the value to be output.

Table 67: Setting – Converting of datapoint types: „1 Bit => 1 Byte value 0 – 100 %“

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Format converter Input	1 Bit	Input object.
1	F1: – Format converter Control Input	1 Bit	Control input (shift function)
4	F1: – Format converter Output	1 Byte	Output of one of the four set values.
+10	**next function**		

Table 68: Communication objects – Converting of datapoint types: „1 Bit => 1 Byte value 0 – 100 %“

5.11.3 Settings for „1 Bit => 2 Byte temperature value“

This function can be used to switch between 2 temperature values with a 1 Bit object. For this purpose, the output object is assigned a temperature value in 2 Byte format for “0” and “1” of the input object.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Send output value if input = 0	▪ not active ▪ **active**	Activation Output of the temperature value when bit input = “0”.
Temperature value	-50 … 600 °C **[0 °C]**	Setting the temperature value. **Only for “Send output value if input = 0” → „active“.**
Send output value if input = 1	▪ **not active** ▪ active	Activation Output of the temperature value when bit input = “1”.
Temperature value	-50 … 600 °C **[0 °C]**	Setting the temperature value. **Only for “Send output value if input = 0” → „active“.**

Table 69: Setting – Converting of datapoint types: „1 Bit => 2 Byte temperature value“

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Format converter Input	1 Bit	Input
4	F1: – Format converter Output	2 Byte	Output of one of the two default values.
+10	**next function**		

Table 70: Communication objects – Converting of datapoint types: „1 Bit => 2 Byte temperature value“

5.11.4 Settings for „1 Bit => 2 Byte float value“

This function can be used to switch between 2 floating point values with a 1 Bit signal. For this purpose, the input value is assigned a floating point value in 2 Byte format for “0” and “1” of the input object.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Send output value if input = 0	▪ not active ▪ **active**	Activation of the output at input value “0”.
Floating point value	-670760 … 670760 **[0]**	Setting the value for input = 0.
Send output value if input = 1	▪ **not active** ▪ active	Activation of the output at input value “1”.
Floating point value	-670760 … 670760 **[0]**	Setting the value for input = 1.

Table 71: Setting – Converting of datapoint types: „1 Bit => 2 Byte float value“

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Format converter Input	1 Bit	Input
4	F1: – Format converter Output	2 Byte	Output of one of the two default values.
+10	**next function**		

Table 72: Communication objects – Converting of datapoint types: „1 Bit => 2 Byte float value“

5.11.5 Settings for „1 Bit => 14 Byte text"

With this function it is possible to use 1 Bit values to specify which text is output via the output object. Up to 4 texts can be active, with text 1 having the highest priority.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Number of inputs	1 – 4 **[1]**	Number of inputs that can be used.
Send text if input 1 = 1 (highest priority)	Any text (up to 14 characters allowed)	Text message on communication object if input 1 = 1.
Send text if input 2 = 1	Any text (up to 14 characters allowed)	Text message on communication object if input 2 = 1. **If „Number of inputs" >= „2".**
Send text if input 3 = 1	Any text (up to 14 characters allowed)	Text message on communication object if input 3 = 1. **If „Number of inputs" >= „3".**
Send text if input 4 = 1 (lowest priority)	Any text (up to 14 characters allowed)	Text message on communication object if input 4 = 1. **If „Number of inputs" = „4".**

Table 73: Setting – Converting of datapoint types: „1 Bit => 14 Byte text"

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Format converter Input 1	1 Bit	Input for activating text 1.
1	F1: – Format converter Input 2	1 Bit	Input for activating text 2.
2	F1: – Format converter Input 3	1 Bit	Input for activating text 3.
3	F1: – Format converter Input 4	1 Bit	Input for activating text 4.
4	F1: – Format converter Output	14 Byte	Output of one of the 4 text lines.
+10	**next function**		

Table 74: Communication objects – Converting of datapoint types: „1 Bit => 14 Byte text"

5.11.6 Settings for „2 x 1 Bit => 2 Bit control“

This function can be used to specify via 2 x 1 Bit input values whether an output object is written with forced guidance “Priority OFF” (10), “Priority ON”(11) or “No priority” (00).

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Number of inputs	▪ **1 input** ▪ 2 inputs	Number of inputs that will be used.
Function by value 0	▪ **no priority** ▪ priority with value OFF ▪ priority with value ON	Default if input = 0. **If „Number of inputs“ → „1“.**
Function by value 1	▪ **no priority** ▪ priority with value OFF ▪ priority with value ON	Default if input = 1. **If „Number of inputs“ → „1“.**

Table 75: Setting – Converting of datapoint types: „2 x 1 Bit => 2 Bit control“

If “Number of inputs” → “2 inputs” is set, the output object behaves as follows:

Input 1	Input 2	Output
0	0	no priority, off
0	1	no priority, on
1	0	priority, off
1	1	priority, on

Table 76: Converting of datapoint types – „2 x 1 Bit => 2 Bit control“: Behaviour with 2 inputs

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Format converter Input	1 Bit	Input object to select a predefined value.
0	F1: – Format converter Input priority	1 Bit	Input object for priority selection.
1	F1: – Format converter Input value	1 Bit	Input object for activating the value
4	F1: – Format converter Output	2 Bit	Output priority object.
+10	**next function**		

Table 77: Communication objects – Converting of datapoint types: „2 x 1 Bit => 2 Bit control“

5.11.7 Settings for „8 x 1 Bit => 1 Byte "

This function can be used to create a 1 Bit object via 8 x 1 Bit objects. A distinction can be made here as to whether the 1 Byte value should be Bit coded, a step switch Bit coded (0-255) or a step switch with free adjustable percentage values.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Structure of byte value	▪ **Bit coded (0 – 255) E1 = Bit 0 ... E8 = Bit 7)** ▪ level switch (level 1 = E1 ... level 8 = E8) ▪ level switch => percent value	Selection of the structure of the converted object.
Percent value for level 0 (OFF)	0 – 100 % **[0 %]**	Percentage value assigned to the level that is written to the output object. **Only for "Structure of byte value" → "level switch => percent value".**
Percent value for level 1	0 – 100 % **[10 %]**	
Percent value for level 2	0 – 100 % **[20 %]**	
Percent value for level 3	0 – 100 % **[35 %]**	
Percent value for level 4	0 – 100 % **[50 %]**	
Percent value for level 5	0 – 100 % **[60 %]**	
Percent value for level 6	0 – 100 % **[70 %]**	
Percent value for level 7	0 – 100 % **[85 %]**	
Percent value for level 8	0 – 100 % **[100 %]**	

Table 78: Setting – Converting of datapoint types: „8 x 1 Bit => 1 Byte"

“Structure of Byte value” → “Bit coded (0 – 255)”:

The output value corresponds to the bit word of the input values.

I1	I2	I3	I4	I5	I6	I7	I8	Output
0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1
0	1	0	0	0	0	0	0	2
1	1	0	0	0	0	0	0	3
…								
1	1	1	1	1	1	1	1	255

Table 79: Converting of datapoint types – „8 x 1 Bit => 1 Byte“: Bit value → bit coded (0 – 255)

“Structure of Byte value” → “level switch (level 1 = E1 … level 8 = E8)”:

The output value corresponds to the bit of the input. If more than one input is defined with “1”, the input for the higher level is accepted.

I1	I2	I3	I4	I5	I6	I7	I8	Output
0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1
0	1	0	0	0	0	0	0	2
0	0	1	0	0	0	0	0	3
0	0	0	1	0	0	0	0	4
…								
0	0	0	0	0	0	0	1	8

Table 80: Converting of datapoint types – „8 x 1 Bit => 1 Byte“: Bit value => Level switch (level 1=E1…)

“Structure of Byte value” → “level switch => percent value”

The output value corresponds to the bit word of the input values. If more than one input is defined as “1”, the input for the higher percentage value is prioritised.

I1	I2	I3	I4	I5	I6	I7	I8	Output
0	0	0	0	0	0	0	0	Percent value for level 0
1	0	0	0	0	0	0	0	Percent value for level 1
0	1	0	0	0	0	0	0	Percent value for level 2
0	0	1	0	0	0	0	0	Percent value for level 3
…								
0	0	0	0	0	0	0	1	Percent value for level 8

Table 81: Converting of datapoint types – „8 x 1 Bit => 1 Byte“: Bit value => Level switch …

If the setting “Structure of Byte value” → “Bit coded (0 – 255)” the following communication objects are available

No.	Name / Object function	Length	Usage
0	F1: – Format converter Input 1	1 Bit	Input object for bit 0 of the byte value.
1	F1: – Format converter Input 2	1 Bit	Input object for bit 1 of the byte value.
2	F1: – Format converter Input 3	1 Bit	Input object for bit 2 of the byte value.
3	F1: – Format converter Input 4	1 Bit	Input object for bit 3 of the byte value.
4	F1: – Format converter Input 5	1 Bit	Input object for bit 4 of the byte value.
5	F1: – Format converter Input 6	1 Bit	Input object for bit 5 of the byte value.
6	F1: – Format converter Input 7	1 Bit	Input object for bit 6 of the byte value.
7	F1: – Format converter Input 8	1 Bit	Input object for bit 7 of the byte value.
9	F1: – Format converter Output	1 Byte	Output - object
+10	**next function**		

Table 82: Communication objects – Converting of datapoint types: „8 x 1 Bit => 1 Byte“: bit coded

If the setting “Structure of Byte value” → „level switch …“ the following communication objects are available:

No.	Name / Object function	Length	Usage
0	F1: – Format converter level 1 Input	1 Bit	Input object for level 1.
1	F1: – Format converter level 2 Input	1 Bit	Input object for level 2.
2	F1: – Format converter level 3 Input	1 Bit	Input object for level 3.
3	F1: – Format converter level 4 Input	1 Bit	Input object for level 4.
4	F1: – Format converter level 5 Input	1 Bit	Input object for level 5.
5	F1: – Format converter level 6 Input	1 Bit	Input object for level 6.
6	F1: – Format converter level 7 Input	1 Bit	Input object for level 7.
7	F1: – Format converter level 8 Input	1 Bit	Input object for level 8.
9	F1: – Format converter Output	1 Byte	Output - object
+10	**next function**		

Table 83: Communication objects – Converting of datapoint types: „8 x 1 Bit => 1 Byte“ level switch …”

5.11.8 Settings for „2 Bit control => 2 x 1 Bit“

With this function it is possible to read out 2 Bit objects (priority, forced guidance) and convert them into two or three 1 Bit objects.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Object selection	▪ 3x Bit (priority ON, priority OFF, priority active) ▪ 2x Bit (ON/OFF, priority active)	Structure how the objects are to be read out.

Table 84: Setting – Converting of datapoint type: „2 Bit control => 2 x 1 Bit“

With the **“2x Bit (ON/OFF, priority active)”** function, the output objects behave as follows:

Input	ON / OFF	Priority active	Description of function
00	0	0	no priority, Off
01	1	0	no priority, On
10	0	1	priority, Off
11	1	1	priority, On

Table 85: Converting of datapoint types – „2 Bit control => 2 x 1 Bit“: Objects selection 2 x Bit

With the **“3x Bit (priority ON, priority OFF, priority active)”** function, the output objects behave as follows:

Input	ON	OFF	Priority active	Description of function
00	0	0	0	no priority, Off
01	0	0	0	no priority, On
10	0	1	1	priority, Off
11	1	0	1	priority, On

Table 86: Converting of datapoint types – „2 Bit control => 2 x 1 Bit“: Objects selection 3 x Bit

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Format converter Input	2 Bit	2 bit input
4	F1: – Format converter Priority, ON	1 Bit	Output object, whether priority is “ON”.
5	F1: – Format converter Priority, OFF	1 Bit	Output object, whether priority is “OFF”.
5	F1: – Format converter ON/OFF	1 Bit	Output object, whether priority “ON” / “OFF”.
6	F1: – Format converter Priority active	1 bit	Output object, whether forced guidance is active
+10	**next function**		

Table 87: Communication objects – Converting of datapoint types: „2 Bit control => 2 x 1 Bit“

5.11.9 Settings for „1 Byte value (0 – 255) => 1 Bit“

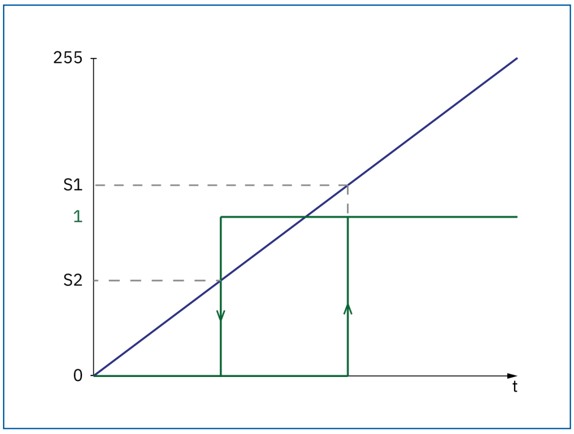
This function is used to realise a threshold switch with switch-off hysteresis. When an adjustable threshold value has been reached, the output object is set to “1” and back to “0” when it falls below a switch-off threshold. The behaviour of the output object can be inverted.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Send ON if greater than or equal	0 … 255 **[0]**	Switch-on threshold at which the output object switches to “1”.
Send OFF if less then	0 … 255 **[0]**	Switch-off threshold below which the output object switches to “0”.
Invert output	▪ **no** ▪ yes	Invert the output object. „0 → 1“; „1 → 0“

Table 88: Setting – Converting of datapoint types: „1 Bit value 0 – 255 => 1 Bit“

The following diagram shows the behaviour of the output object (green) in relation to the input object (blue):



S1: Send ON if greater than or equal

S2: Send OFF if less than

Figure 8: Diagram – Converting of datapoint types – „1 Byte value 0 – 255 => 1 Bit“

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Format converter Input	1 Byte	Input object
4	F1: – Format converter Output	1 Bit	Output object
+10	**next function**		

Table 89: Communication objects – Converting of datapoint types: „1 Bit value 0 – 255 => 1 Bit“

5.11.10 Settings for „1 Byte value (0 – 100%) => 1 Bit“

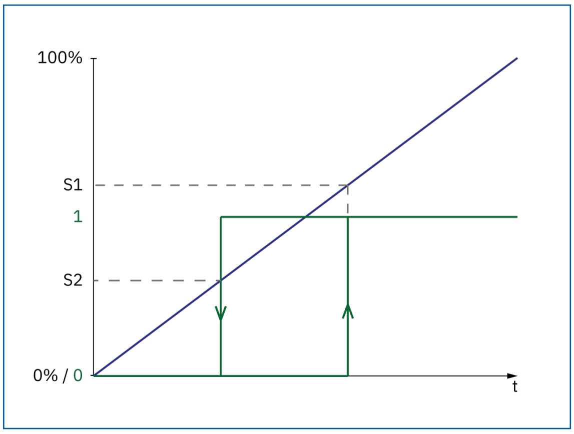
This function is used to realise a threshold switch with switch-off hysteresis. When an adjustable threshold value has been reached, the output object is set to “1” and back to “0” when it falls below a switch-off threshold. The behaviour of the output object can be inverted.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Send ON if greater than or equal	0 – 100 % **[0 %]**	Switch-on threshold at which the output object switches to “1”.
Send OFF if less then	0 – 100% **[0 %]**	Switch-off threshold below which the output object switches to “0”.
Invert output	■ **no** ■ yes	Invert the output object. „0 → 1“; „1 → 0“

Table 90: Setting – Converting of datapoint types: „1 Bit value 0 – 100 % => 1 Bit“

The following diagram shows the behaviour of the output object (green) in relation to the input object (blue):



S1: Send ON if greater than or equal
S2: Send OFF if less than

Figure 9: Diagram – Converting of datapoint types – „1 Byte value 0 – 100 % => 1 Bit“

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Format converter Input	1 Byte	Input object
4	F1: – Format converter Output	1 Bit	Output object
+10	**next function**		

Table 91: Communication objects – Converting of datapoint types: „1 Bit value 0 – 100 % => 1 Bit“

5.11.11 Settings for „1 Byte => 8 x 1 Bit "

This function can be used to assign a 1 Byte value (0-255 / 0-100%) to up to 8 output objects, each with a length of 1 Bit. A distinction is made here as to whether the 1 Byte input value is to be converted into 8x 1 Bit values bit-coded, as a step switch with 8 outputs or as a step switch analogue to 8 freely adjustable percentage values.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Structure of Byte value	▪ **Bit coded (0-255)** **A1 = Bit 0 ... A8 = Bit 7)** ▪ level switch (level 1 = A1 ... level 8 = A8) ▪ percent => level switch	Selection of the structure of the converted object.
Percent value for level 1	0 – 100 % **[10 %]**	Percentage value to be used for the output objects "Output 1" (up to 8). **Only for "Structure of Byte value" → "percent => level switch".** **From the level that is configured as "not active", the associated communication objects and the parameter input are hidden.**
Percent value for level 2	0 – 100 % **[20 %]**	
Percent value for level 3	0 – 100 % **[35 %]**	
Percent value for level 4	0 – 100 % **[not active]**	
Percent value for level 5	0 – 100 % **[not active]**	
Percent value for level 6	0 – 100 % **[not active]**	
Percent value for level 7	0 – 100 % **[not active]**	
Percent value for level 8	0 – 100 % **[not active]**	

Table 92: Setting – Converting of datapoint types: „1 Byte => 8 x 1 Bit"

Structure of Byte value → Bit coded (0 – 255)
The assignment of the output objects corresponds to the bit word of the input value.

Format converter Input	O1	O2	O3	O4	O5	O6	O7	O8
0	0	0	0	0	0	0	0	0
1	1	0	0	0	0	0	0	0
2	0	1	0	0	0	0	0	0
3	1	1	0	0	0	0	0	0
…								
255	1	1	1	1	1	1	1	1

Table 93: Converting of datapoint types – „1 Byte => 8 x 1 Bit“: Structure of Byte value => bit coded …

Structure of Byte value → level switch (level 1 = A1 … level 8 = A8)
The 1 bit output objects are defined according to the 1 byte value (0-255) of the input object. For values above “8” in the input object, all output objects are output as “0”.

Format converter Input	O1	O2	O3	O4	O5	O6	O7	O8
0	0	0	0	0	0	0	0	0
1	1	0	0	0	0	0	0	0
2	0	1	0	0	0	0	0	0
…								
8	0	0	0	0	0	0	0	1

Table 94: Converting of datapoint types – „1 Byte => 8 x 1 Bit“: Structure of Byte value => Level switch

Structure of Byte value → percent => level switch
The 1 bit output objects are assigned according to the set level values of the 1 byte input object (0-100%). In this example, level 1 is defined as 2% and level 2 as 4%. The other levels have the same behaviour. From the level in which “not active” was entered as the default value, no communication objects appear for this and all other levels.

Format converter Input	O1	O2	O3	O4	O5	O6	O7	O8
0 %	0	0	0	0	0	0	0	0
1 %	0	0	0	0	0	0	0	0
2 %	1	0	0	0	0	0	0	0
3 %	1	0	0	0	0	0	0	0
4 %	0	1	0	0	0	0	0	0
5 %	0	1	0	0	0	0	0	0
…								
100 %	0	0	0	0	0	0	0	1

Table 95: Converting of datapoint types – „1 Byte => 8 x 1 Bit“:Structure of Byte value => percent …

With the setting “Structure of Byte value” → “Bit coded (0 – 255)”, the following communication objects are available:

No.	Name / Object function	Length	Usage
0	F1: – Format converter Output 1	1 Bit	Output object for bit 1 of the byte value.
1	F1: – Format converter Output 2	1 Bit	Output object for bit 2 of the byte value.
2	F1: – Format converter Output 3	1 Bit	Output object for bit 3 of the byte value.
3	F1: – Format converter Output 4	1 Bit	Output object for bit 4 of the byte value.
4	F1: – Format converter Output 5	1 Bit	Output object for bit 5 of the byte value.
5	F1: – Format converter Output 6	1 Bit	Output object for bit 6 of the byte value.
6	F1: – Format converter Output 7	1 Bit	Output object for bit 7 of the byte value.
7	F1: – Format converter Output 8	1 Bit	Output object for bit 8 of the byte value.
9	F1: – Format converter Input	1 Byte	Input Object
+10	**next function**		

Table 96: Communication objects – Converting of datapoint types: „1 Byte => 8 x 1 Bit“: Bit coded ...

With the setting “Structure of Byte value” → “level switch …” or “percent …”, the following communication objects are available:

No.	Name / Object function	Length	Usage
0	F1: – Format converter level 1 Output	1 Bit	Output object for level 1.
1	F1: – Format converter level 2 Output	1 Bit	Output object for level 2.
2	F1: – Format converter level 3 Output	1 Bit	Output object for level 3.
3	F1: – Format converter level 4 Output	1 Bit	Output object for level 4.
4	F1: – Format converter level 5 Output	1 Bit	Output object for level 5.
5	F1: – Format converter level 6 Output	1 Bit	Output object for level 6.
6	F1: – Format converter level 7 Output	1 Bit	Output object for level 7.
7	F1: – Format converter level 8 Output	1 Bit	Output object for level 8.
9	F1: – Format converter Input	1 Byte	Input Object
+10	**next function**		

Table 97: Communication objects – Converting of datapoint types: „1 Byte => 8 x 1 Bit“: Level switch

5.11.12 Settings for „1 Byte inverter 0 => 255 / 255 => 0“

This function can be used to invert the decimal value of a 1 byte object.
In the input object, “0” is replaced by “1” and “1” by “0”. This value is written to the output object as a decimal value (0-255).

Example:
The value to be inverted in the input object is “53” (bit pattern 00110101). The value written to the output object is then “202” (bit pattern 11001010).

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Format converter Input	1 Byte	Input object which is to be inverted.
4	F1: – Format converter Output	1 Byte	Output object returns the inverted input object.

Table 98: Communication objects – Converting of datapoint types: „1 Byte inverter 0=>255 / 255=>0“

5.11.13 Settings for „2 x 1 Byte => 2 Byte“

This function can be used to create a 2-byte object from 2 objects with a length of 1 byte. To do this, the bit pattern of the “Format converter value 1 input” object is set in front of the bit pattern of the “Format converter value 2 input” object.

Explanation:
The value in the “Format converter value 1 input” object is “53” (bit pattern 00110101).
The value in the “Format converter value 2 input” object is “202” (bit pattern 11001010).

This results in the value 13770 for the output object (bit pattern 00110101 11001010).

In this case, the content of the output object is calculated as follows: (53 x 256) + 202.

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Format converter value 1 Input	1 Byte	Input object for the first 8 digits of the bit pattern.
1	F1: – Format converter value 2 Input	1 Byte	Input object for the last 8 digits of the bit pattern.
4	F1: – Format converter output	2 Byte	Output object returns the converted value.

Table 99: Communication objects – Converting of datapoint types: „2 x 1 Byte => 2 Byte“

5.11.14 Settings for „3 x 1 Byte => 3 Byte“

This function can be used to create a 3 Byte object from 3 objects with a length of 1 Byte. To do this, the bit pattern is structured as follows:
„Format converter value 1 Input“ „Format converter value 2 Input“ „Format converter value 3 Input“.

This function can be used to generate a 3 Byte RGB value from 3 decimal values (0-255).

Explanation:
The value in the “Format converter value 1 input” object is “53” (Hex: 35).
The value in the “Format converter value 2 input” object is “202” (Hex CA).
The value in the “Format converter value 3 input” object is “148” (Hex 94).
This results in the value 3,525,268 (Hex 35 CA 94) for the output object.

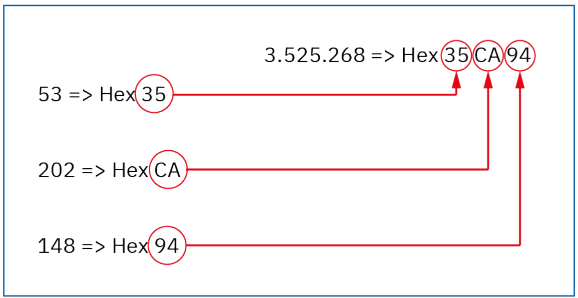


Figure 10: Converting of datapoint types – „3 x 1 Byte => 3 Byte“

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Format converter value 1 input	1 Byte	Input object for the first 8 digit block of the bit pattern.
1	F1: – Format converter value 2 input	1 Byte	Input object for the middle 8 digit block of the bit pattern.
2	F1: – Format converter value 3 input	1 Byte	Input object for the last 8 digit block of the bit pattern.
4	F1: – Format converter Output	3 Byte	Output object returns the converted value.

Table 100: Communication objects – Converting of datapoint types: „3 x 1 Byte => 3 Byte“

5.11.15 Settings for „4 x 1 Byte => 4 Byte"

This function can be used to create a 3 Byte object from 3 objects with a length of 1 Byte. To do this, the bit pattern is structured as follows:
„Format converter value 1 Input" „Format converter value 2 Input" „Format converter value 3 Input" „Format converter value 4 Input".

Explanation:
The value in the "Format converter value 1 input" object is "53" (Hex: 35).
The value in the "Format converter value 2 input" object is "202" (Hex CA).
The value in the "Format converter value 3 input" object is "148" (Hex 94).
he value in the "Format converter value 3 input" object is „18" (Hex 12).

This results in the value 902.468.626 (Hex 35 CA 94 12) for the output object. .

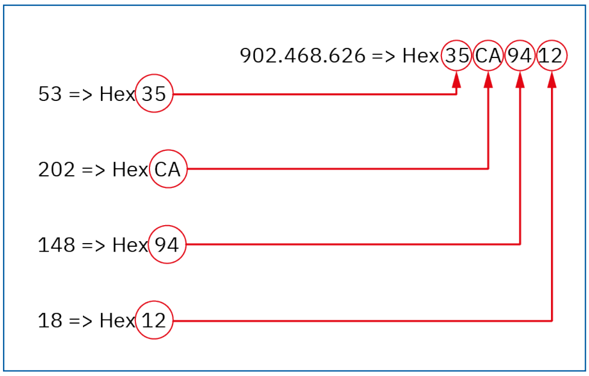


Figure 11: Converting of datapoint types – „4 x 1 Byte => 4 Byte"

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Format converter value 1 input	1 Byte	Input object for the first 2 digits of the hex value.
1	F1: – Format converter value 2 input	1 Byte	Input object for the 3rd and 4th digit of the hex value.
2	F1: – Format converter value 3 input	1 Byte	Input object for the 5th and 6th digit of the hex value.
3	F1: – Format converter value 4 input	1 Byte	Input object for the 7th and 8th digit of the hex value.
4	F1: – Format converter Output	4 Byte	Output object returns the converted value.

Table 101: Communication objects – Converting of datapoint types: „4 x 1 Byte => 4 Byte"

5.11.16 Settings for „2 Byte temperature value => 1 Bit“

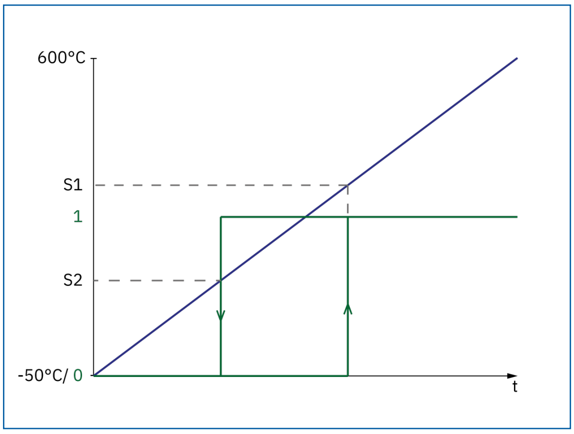
This function is used to realise a threshold switch with switch-off hysteresis. When an adjustable threshold value has been reached, the output object is set to “1” and back to “0” when it falls below a switch-off threshold. The behaviour of the output object can be inverted.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Send ON if greater than or equal	-50 … 600 °C **[0 °C]**	Switch-on threshold at which the output object switches to “1”.
Send OFF if less than	-50 … 600 °C **[0 °C]**	Switch-off threshold below which the output object switches to “0”.
Invert output	▪ **no** ▪ yes	Invert the output object. „0 → 1“; „1 → 0“

Table 102: Setting – Converting of datapoint types: „2 Byte temperature value => 1 Bit“

The following diagram shows the behaviour of the output object (green) in relation to the input object (blue):



S1: Send ON if greater than or equal
S2: Send OFF if less then

Figure 12: Diagram – Converting of datapoint types – „2 Byte temperature value => 1 Bit“

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Format converter Input	2 Byte	Input object
4	F1: – Format converter Output	1 Bit	Output object

Table 103: Communication objects – Converting of datapoint types: „2 Byte temperature value => 1 Bit“

5.11.17 Settings for „2 Byte float value => 1 Bit“

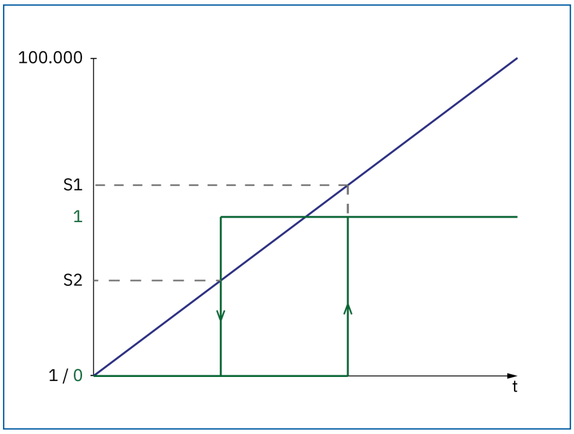
This function is used to realise a threshold switch with switch-off hysteresis. When an adjustable threshold value has been reached, the output object is set to “1” and back to “0” when it falls below a switch-off threshold. The behaviour of the output object can be inverted.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Send ON if greater than or equal	1 … 100.000 **[1]**	Threshold at which and above which the output sends an “ON”.
Send OFF if less then	1 … 100.000 **[1]**	Threshold below which the output sends an “OFF”.
Invert output	■ **no** ■ yes	Invert the output object.

Table 104: Setting – Converting of datapoint types: „2 Byte float value => 1 Bit“

The following diagram shows the behaviour of the output object (green) in relation to the input object (blue):



S1: Send ON if greater than or equal

S2: Send OFF if less then

Figure 13: Diagram – Converting of datapoint types – „2 Byte float value => 1 Bit“

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Format converter Input	2 Byte	Input object
4	F1: – Format converter Output	1 Bit	Output object

Table 105: Communication objects – Converting of datapoint types: „2 Byte float value => 1 Bit“

5.11.18 Settings for „2 Byte => 2 x 1 Byte "

This function can be used to create two objects with a length of 1 Byte from an object with a length of 2 Byte.

Explanation:

The value in the "Format converter input" object is 13770 (bit pattern 00110101 11001010).

The value in the "Format converter value 1 output" object is "53" (bit pattern 00110101).
The value in the "Format converter value 2 output" object is "202" (bit pattern 11001010).

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Format converter value 1 output	1 Byte	Output object for the first 8 digit block of the bit pattern.
1	F1: – Format converter value 2 output	1 Byte	Output object for the last 8 digit block of the bit pattern.
4	F1: – Format converter input	2 Byte	Input object

Table 106: Communication objects – Converting of datapoint types: „2 Byte => 2 x 1 Byte"

5.11.19 Settings for „3 Byte => 3 x 1 Byte“

This function can be used to create 3 objects with a length of 1 Byte from an object with a length of 3 Byte.

<u>Explanation:</u>
The value in the input object “Format converter input” is 3,525,268 (Hex 35 CA 94)

The value in the “Format converter value 1 output” object is “53” (Hex: 35).
The value in the “Format converter value 2 output” object is “202” (Hex CA).
The value in the “Format converter value 3 output” object is “148” (Hex 94).

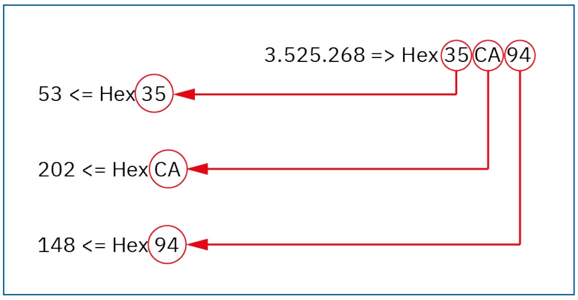


Figure 14: Converting of datapoint types – „3 Byte => 3 x 1 Byte“

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Format converter value 1 output	1 Byte	Output object for the 1^{st} and 2^{nd} digit of the hex value
1	F1: – Format converter value 2 output	1 Byte	Output object for the 3^{rd} and 4^{th} digit of the hex value
2	F1: – Format converter value 3 output	1 Byte	Output object for the 5^{th} and 6^{th} digit of the hex value
4	F1: – Format converter input	3 Byte	Input object

Table 107: Communication objects – Converting of datapoint types: „3 Byte => 3 x 1 Byte“

5.11.20 Settings for „4 Byte => 4 x 1 Byte“

This function can be used to create 4 objects with a length of 1 Byte from an object with a length of 4 Byte.

Explanation:
The value in the “Format converter input” object is 902.468.626 (Hex 35 CA 94 12)

The value in the “Format converter value 1 output” object is “53” (Hex: 35).
The value in the “Format converter value 2 output” object is “202” (Hex CA).
The value in the “Format converter value 3 output” object is “148” (Hex 94).
The value in the “Format converter value 4 input” object is “18” (Hex 12).

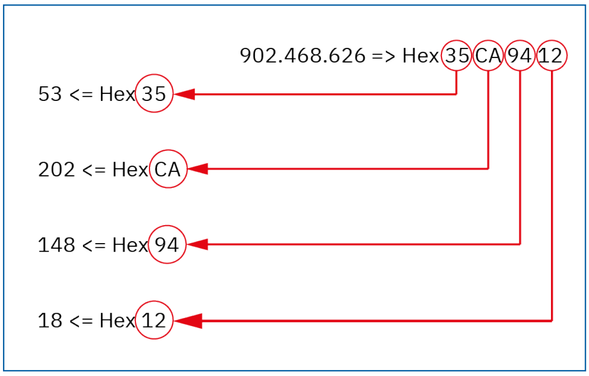


Figure 15: Converting of datapoint types – „4 Byte => 4 x 1 Byte“

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Format converter value 1 output	1 Byte	Output object for the 1st and 2nd digit of the hex value.
1	F1: – Format converter value 2 output	1 Byte	Output object for the 3rd and 4th digit of the hex value.
2	F1: – Format converter value 3 output	1 Byte	Output object for the 5th and 6th digit of the hex value.
3	F1: – Format converter value 4 output	1 Byte	Output object for the 7th and 8th digit of the hex value.
4	F1: – Format converter input	4 Byte	Input object

Table 108: Communication objects – Converting of datapoint types: „4 Byte => 4 x 1 Byte“

5.11.21 Settings for „14 Byte text => Bit / Byte“

This function can be used to switch between 2 values with a 14 Byte text. For this purpose, the output value is assigned a value for the “Text equal to” state and the “Text unequal to” state.
The text can be compared and evaluated with up to 4 comparison texts.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
DPT for outputs	▪ **DPT 1.001 On/Off** ▪ DPT 5.005 1 Byte decimal value (0...255) ▪ DPT 5.001 1 Byte percent value (0...100%)	Select the datapoint type for the output of the predefined value.
Comparative text 1 (... 4)	Custom text (up to 14 characters allowed)	Comparison text for evaluation of output 1.
If text equal send to output 1 (... 4)	▪ not active ▪ **active**	Activation of the verification whether text 1 is the same.
Value for output 1 (... 4)	▪ value 0 ▪ value 1	Output value if text 1 is equal. **If „DPT for outputs“ → „On/Off“.**
Value for output 1 (... 4)	0 ... 255 **[0]**	Output value if text 1 is equal. **If „DPT for outputs“ → „decimal value (0 ... 255)“.**
Value for output 1 (... 4)	0 – 100 % **[0 %]**	Output value if text 1 is equal. **If „DPT for outputs“ → „percent value (0 ... 100%)“.**
If text unequal send to output 1 (... 4)	▪ not active ▪ **active**	Activation of the verification whether text 1 is not the same.
Value for output 1 (... 4)	▪ value 0 ▪ value 1	Output value if text 1 is unequal. **If „DPT for outputs“ → „On/Off“**
Value for output 1 (... 4)	0 ... 255 **[0]**	Output value if text 1 is unequal. **If „DPT for outputs“ → „decimal value (0 ... 255)“.**
Value for output 1(... 4)	0 – 100 % **[0 %]**	Output value if text 1 is unequal. **If „DPT for outputs“ → „percent value (0 ... 100%)“.**

Table 109: Setting – Converting of datapoint types: „14 Byte text => Bit / Byte“

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Format converter Output 1	1 Bit 1 Byte	Result for text compare with comparative text 1.
1	F1: – Format converter Output 2	1 Bit 1 Byte	Result for text compare with comparative text 2.
2	F1: – Format converter Output 3	1 Bit 1 Byte	Result for text compare with comparative text 3.
3	F1: – Format converter Output 4	1 Bit 1 Byte	Result for text compare with comparative text 4.
4	F1: – Format converter Input	14 Byte	Input object Text for the comparison.
+10	**next function**		

Table 110: Communication objects – Converting of datapoint types: „14 Byte text => Bit / Byte“

5.11.22 Settings for „Universal (1 Bit - 4 Byte)“

The “Universal (1 Bit - 4 Byte)” function can be used to convert values from one bit model to an other bit model.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Input DPT	▪ **DPT 1.001 On/Off** ▪ DPT 5.005 1 Byte decimal value (0...255) ▪ DPT 5.001 1 Byte percent value (0-100%) ▪ DPT 7.* 2 Byte unsigned value ▪ DPT 8.* 2 Byte signed value ▪ DPT 9.* 2 Byte floating value ▪ DPT 12.* 4 Byte unsigned value ▪ DPT 13.* 4 Byte signed value ▪ DPT 14.* 4 Byte floating value	Setting the DPT for the input Object.
Output DPT		Setting the DPT for the output Object.

Table 111: Setting – Converting of datapoint types: „Universal (1 Bit - 4 Byte)“

Explanation:
The conversion is made from the input format to the output format without changing the values.
If the output value is above or below the permitted range when converting, the minimum or maximum possible value for this bit model is being output.

Example:

Converting task	Value in area	Value out of area
2 byte unsigned value → decimal value	176 → 176	2387 → **255**
2 byte signed value → 2 byte unsigned value	371 → 371	-371 → **0**
4 byte floating value → 2 byte signed value	31750 → 31750	**1278,3 → 1278**

Table 112: Converting of datapoint types – „Universal (1 Bit - 4 Byte)“: Valid and non valid conversions

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	Format converter Input	1 Bit 1 Byte 2 Byte 4 Byte	Input object to be converted from.
1	Format converter Output		Output object in converted format.
+10	**next function**		

Table 113: Communication objects – Converting of datapoint types: „Universal (1 Bit - 4 Byte)“

5.12 Filter functions / Limiter

With this function, it is possible to limit an input object to a value range or to filter it and thereby return only the values within this value range as valid values. For some datapoint types, if the value range is exceeded in either direction, the minimum or maximum value can be returned via the output object.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Datapoint type	▪ **DPT 1.* 1 Bit** ▪ DPT 2.001 2 Bit switch control ▪ DPT 3.007 4 Bit dimming control ▪ DPT 17.001 1 Byte scene number ▪ DPT 5.005 1 Byte decimal value (0...255) ▪ DPT 5.001 1 Byte percent value (0...100%) ▪ DPT 6.010 1 Byte value (-128...127) ▪ DPT 7.* 2 Byte unsigned value ▪ DPT 8.* 2 Byte signed value ▪ DPT 9.* 2 Byte floating value ▪ DPT 232.600 RGB value ▪ DPT 12.* 4 Byte unsigned value ▪ DPT 13.* 4 Byte signed value ▪ DPT 14.* 4 Byte floating value ▪ DPT 16.001 14 Byte text	DPT to be used by the filter functions / limiter function.
If „Datapoint type" → „ 1 Bit"		
Filter function	▪ **pass only OFF** ▪ pass only ON ▪ split On/Off filter in 2 CO	Specifies if "1" or "0" is identified as a valid object value or if the input value is split into one output each for "1" and "0".
Filter condition	▪ filter if control input = 0 ▪ filter if control input = 1 ▪ **filter always**	Sets when the filter is active.
If „Datapoint type" →„scene number"		
Minimum scene number	1 – 64 **[1]**	Defines the minimum valid scene number.
Maximum scene number	1 – 64 **[64]**	Defines the maximum valid scene number.
Filter condition	▪ filter if control input = 0 ▪ filter if control input = 1 ▪ **filter always**	Sets when the filter is active.

ETS Text	Dynamic range **[Default value]**	Comment
If „Datapoint type“ → „decimal value (0...255)“		
Minimum value	0 ... 255 **[0]**	Sets the minimum valid decimal value.
Maximum value	0 ... 255 **[255]**	Sets the maximum valid decimal value.
Filter condition	▪ filter if control input = 0 ▪ filter if control input = 1 ▪ **filter always**	Defines whether the filter is always active or is released via an object.
Behaviour if the upper or lower limits are exceeded	▪ send only filtered/valid values ▪ **send minimum or maximum values**	Specify what happens when the input object is out of range.
If „Datapoint type“ →„percent value (0...100%)“		
Minimum value	0 – 100% **[0]**	Sets the minimum valid percent value.
Maximum value	0 – 100% **[100%]**	Sets the maximum valid percent value.
Filter condition	▪ filter if control input = 0 ▪ filter if control input = 1 ▪ **filter always**	Defines whether the filter is always active or is released via an object.
Behaviour if the upper or lower limits are exceeded	▪ send only filtered/valid values ▪ **send minimum or maximum values**	Specify what happens when the input object is out of range.
If „Datapoint type“ →„value (-128...127)“; „ 2 Byte unsigned value“; „ 2 Byte signed value“; „2 Byte floating value“; „4 Byte unsigned value“; „4 Byte signed value“; „4 Byte floating value“		
Minimum value	-128 ... 127 0 ... 65535 -32768 ... 32767 -670670 ... 670670 0 ... 4294967295 -2147483648 ... 2147483647 -3,4E+38 ... 3,4E+38	Minimum valid value for the filter range. The default value is the minimum value of the DPT.
Maximum value		Maximum valid value for the filter range. The default value is the maximum value of the DPT.
Behaviour if the upper or lower limits are exceeded	▪ send only filtered/valid values ▪ **send minimum or maximum values**	Specify what happens when the input object is out of range.
Send condition / Lock		
Send condition	▪ at change output ▪ **at input telegram**	Defines when the output object is transmitted.

ETS Text	Dynamic range **[Default value]**	Comment
Lock / Enabling	▪ **not active** ▪ lock at value 1 ▪ enabling at value 1	Setting whether and when the value "1" lock or release the function.

Table 114: Setting – Filter functions / Limiter

Note: With the datapoint types "2 Bit switch control", "4 Bit dimming control", "RGB value" and 14 Byte text, the input object is written unfiltered to the output object. The lock and release functions can be used here to lock/release the transfer.

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Filter Input	1 Bit 2 Bit 4 Bit 1 Byte 2 Byte 3 Byte 4 Byte	Input object that is to be filtered or limited.
1	F1: – Filter Control input	1 Bit	Input object for enabling filtering via an object.
4	F1: – Filter Output ON	1 Bit	Transmits an "ON" telegram if the input object is "ON".
4	F1: – Filter Output OFF	1 Bit	Transmits an "OFF" telegram if the input object is "OFF".
4	F1: – Filter Output	2 Bit 4 Bit 1 Byte 2 Byte 3 Byte 4 Byte	Filtered or limited output object.
5	F1: – Filter Output OFF	1 Bit	Transmits an "OFF" telegram if the input object is "OFF".
8	F1: – Logic Lock	1 Bit	Lock object for the logic.
8	F1: – Logic Enabling	1 Bit	Release object for the logic.
+10	**next function**		

Table 115: Communication objects – Filter functions / Limiter

5.13 Comparison of temperature / values

This function makes it possible to compare an object with a reference value or another object. An adjustable hysteresis is provided between the switch-on and switch-off points of the comparison. The result of the comparison can be linked logically “AND” or logically “OR” with a 2nd function to create an over-all result.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Sub function	■ DPT 9.001 temperature value ■ **DPT 5.005 1 Byte decimal value (0...255)** ■ DPT 5.001 1 Byte percent value (0...100 %) ■ DPT 6.010 1 Byte value (-128...127) ■ DPT 7.* 2 Byte unsigned value ■ DPT 8.* 2 Byte signed value ■ DPT 9.* 2 Byte floating value ■ DPT 12.* 4 Byte unsigned value ■ DPT 13.* 4 Byte signed value ■ DPT 14.* 4 Byte floating value	Selection of the DPT that is to be compared.
If “Sub function” → „temperature value“		
Function 1 comparison	■ **temperature value 1 < comparative value** ■ temperature value 1 > comparative value ■ temperature value 1 = comparative value ■ temperature value 1 < temperature value 2 ■ temperature value 1 > temperature value 2 ■ temperature value 1 = temperature value 2 ■ temperature value 1 - temperature value 2 < comparative value ■ temperature value 1 - temperature value 2 > comparative value	Selection of the comparison function.
Hysteresis value (submitted in half)	0,2 ... 5 K **[0.5 K]**	Hysteresis for function 1.
Comparative value	-50 ... 600 °C **[0 °C]**	Comparison value for comparing the selected function 1.
Not if “Sub function” → „temperature value“		
Function 1 comparison	■ **value 1 < comparative value** ■ value 1 > comparative value ■ value 1 = comparative value ■ value 1 < value 2 ■ value 1 > value 2 ■ value 1 = value 2 ■ value 1 - value 2 < comparative value ■ value 1 - value 2 > comparative value	Selection of the compare function.

ETS Text	Dynamic range **[Default value]**	Comment
Hysteresis value	0 … 255 0 … 100% 0 … 65535 -32768 … 32767 -670760 … 670760 0 … 4294967295 -2147483648 … 2147483647 -3,4E + 38 … 3,4E + 38	Difference value between switch-on point and switch-off point. Value range according to datapoint type.
Comparative value		Comparison value for comparison in the selected function. Value range according to datapoint type.
Function 2		
Function 2	▪ **not active** ▪ AND gating with function 1 ▪ OR gating with function 1	Determines whether a 2nd comparison should take place.
The settings for function 2 correspond to those for function 1.		
Send condition	▪ **at change output** ▪ at input telegram	Condition under which the output object is transmitted.
Invert output	▪ **not active** ▪ active	Specifies whether 1 or 0 should be sent if the link is true.
Lock / Enabling	▪ **not active** ▪ lock at value 1 ▪ enabling at value 1	Setting whether and when the value “1” lock or release the function.
Request inputs after reset	▪ **not active** ▪ active	Determines whether all inputs have to be requested after a bus failure

Table 116: Setting – Comparison of temperature / values

Hysteresis value

Half of the switch-on/switch-off difference is deducted from the reference value and half is added to the reference value.

Example:

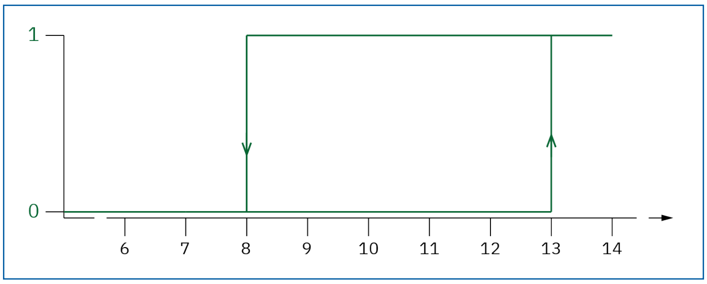


Figure 16: Diagram – Comparison of temperature / values: Hysteresis

Sub function: decimal value (0...255).
Compare: value 1 > comparative value.
Hysteresis: 4.
Comparative value: 10.

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Comparator temperature value 1 Input	2 Byte	Input object 1 for comparison.
0	F1: – Comparator value 1 Input	1 Byte 2 Byte 4 Byte	Input object 1 for comparison.
1	F1: – Comparator temperature value 2 Input	2 Byte	Input object 2 for comparison with temperature value 1.
1	F1: – Comparator value 2 Input	1 Byte 2 Byte 4 Byte	Input object 2 for comparison with value 1.
2	F1: – Comparator temperature value 3 Input	2 Byte	Input object 3 for comparison.
2	F1: – Comparator value 3 Input	1 Byte 2 Byte 4 Byte	Input object 1 for comparison.
3	F1: – Comparator temperature value 4 Input	2 Byte	Input object 4 for comparison with value 3.
3	F1: – Comparator value 4 Input	1 Byte 2 Byte 4 Byte	Input object 4 for comparison with value 3.
4	F1: – Comparator Output	1 Bit	Result of the comparison.
8	F1: – Logic Lock	1 Bit	Lock object for the logic.
8	F1: – Logic Enabling	1 Bit	Release object for the logic.
+10	**next function**		

Table 117: Communication objects – Comparison of temperature / values

5.14 Min/Max/Average value

With this function, it is possible to calculate a minimum value, maximum value or average value from the contents of up to 4 input objects.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Datapoint value	▪ **DPT 5.005 1 Byte decimal value (0...255)** ▪ DPT 5.001 1 Byte percent value (0...100%) ▪ DPT 6.010 1 Byte value (-128...127) ▪ DPT 7.* 2 Byte unsigned value ▪ DPT 8.* 2 Byte signed value ▪ DPT 9.* 2 Byte floating value ▪ DPT 12.* 4 Byte unsigned value ▪ DPT 13.* 4 Byte signed value ▪ DPT 14.* 4 Byte floating value	Datapoint type for min / max / average value determination.
Input 1	**active**	fixed, not settable.
Input 2	**active**	fixed, not settable.
Input 3	▪ **not active** ▪ active	Activation of input 3.
Input 4	▪ **not active** ▪ active	Activation of input 4. **If "Input 3" → „active".**
Calculation of output	▪ **minimal value** ▪ maximal value ▪ average value	Function of the calculation.
Lock / Enabling	▪ **not active** ▪ lock at value 1 ▪ enabling at value 1	Setting whether and when the value "1" lock or release the function.
Send condition	▪ **at change output** ▪ at input telegram	Specifies when an output object is sent.
Send delay / cyclic sending	▪ **not active** ▪ send delay ▪ cyclical sending	Enables the delay or cyclical sending of the output.
Time base	▪ **second** ▪ minute ▪ hour	Setting the time base. **If "Send delay /cyclic sending" → "active"**
Time	0 ... 240 **[10]**	Setting the time value. Unit according to the time base.

ETS Text	Dynamic range **[Default value]**	Comment
Request inputs after reset	▪ **not active** ▪ active	Request all inputs after bus failure.
The output sends only if all inputs are valid	▪ **not active** ▪ active	Only send output when all inputs have been received after bus failure.

Table 118: Setting – Main functions: Min/Max/Average value

Behaviour after bus failure

To ensure correct calculation of the minimum values, maximum values or average values, all current values for the function should be available after a bus failure. This can be done either by actively requesting the input values or by blocking the output telegram up to all values have been received once.

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Minimum value Input 1	1 Byte 2 Byte 4 Byte	1st input for determining the minimum value.
0	F1: – Maximum value Input 1		1st input for determining the maximum value.
0	F1: – Average value Input 1		1st input for determining the average value.
1	F1: – Minimum value Input 2		2nd input for determining the minimum value.
1	F1: – Maximum value Input 2		2nd input for determining the maximum value.
1	F1: – Average value Input 2		2nd input for determining the average value.
2	F1: – Minimum value Input 3		3rd input for determining the minimum value.
2	F1: – Maximum value Input 3		3rd input for determining the maximum value.
2	F1: – Average value Input 3		3rd input for determining the average value.
3	F1: – Minimum value Input 4		4th input for determining the minimum value.
3	F1: – Maximum value Input 4		4th input for determining the maximum value.
3	F1: – Average value Input 4		4th input for determining the average value.
4	F1: – Minimum value Output		Output with the calculated minimum value.
4	F1: – Maximum value Output		Output with the calculated maximum value.
4	F1: – Average value Output		Output with the calculated average value.
8	F1: – Logic Lock	1 Bit	Lock object for the logic.
8	F1: – Logic Enabling	1 Bit	Release object for the logic.
+10	**next function**		

Table 119: Communication objects – Min/Max/Average value

5.15 Time functions

Various time functions can be realised with this function:

1. **Delay**
   It is possible to programme a switch-on delay, a switch-off delay or a switch-on/switch-off delay. The times can be retriggered, so the switch-on delay or the switch-off delay is restarted with every switching operation.
2. **Staircase light**
   An output is switched by an ON signal and is switched off again after an adjustable time. Before the time has elapsed, it is possible to switch the output off by sending an OFF signal to the input.
3. **Resetting after time**
   The output is switched off by an off signal. The output switches on again after an adjustable time. The timer can be retriggered, which means that the timer is restarted by an off signal before the switch-on time has elapsed.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Sub function	▪ **delay** ▪ staircase light ▪ resetting after time	How the time functions work.
If “Sub function” → „delay“		
Function	▪ **delay signal 0 and 1** ▪ delay signal 0, undelayed 1 ▪ delay signal 1, undelayed 0	▪ On-off delay ▪ Switch-off delay ▪ Switch-on delay
Time base for switching on	▪ **second** ▪ minute ▪ hour	Setting the time base.
Switching on delay	1 … 240 **[10]**	Setting the time value. Unit according to the time base.
Time base for switching off	▪ **second** ▪ minute ▪ hour	Setting the time base.
Switching off delay	1 … 240 **[1]**	Setting the time value. Unit according to the time base.
Time retriggerable	▪ **not active** ▪ active	Retriggering and restarting the timer via the input object.
If “Sub function” → „staircase light“		
Disable at input value = 0	▪ not active ▪ **active**	Enables the output object to be switched off before the time has elapsed.

ETS Text	Dynamic range **[Default value]**	Comment
Time base	▪ **second** ▪ minute ▪ hour	Setting the time base.
Time	1 … 240 **[10]**	Setting the time value. Unit according to the time base.
Time retriggerable	▪ **not active** ▪ active	Retriggering and restarting the timer by the input object.
If "Sub function" → „resetting after time"		
Enable at input value = 1	▪ not active ▪ **active**	Allows the output object to be switched on again before the time has elapsed.
Time base	▪ **second** ▪ minute ▪ hour	Setting the time base.
Time	1 … 240 **[10]**	Setting the time value. Unit according to the time base.
Time retriggerable	▪ **not active** ▪ active	Retriggering and restarting the timer by the input object.
Behaviour of the output-object		
Datapoint type for output	▪ **DPT 1.001 On/Off** ▪ DPT 17.001 scene number ▪ DPT 5.005 1Byte decimal value (0…255) ▪ DPT 5.001 1 Byte percent value (0…100%)	Selects the datapoint type of the output object.
If "Datapoint type for output" → „On/Off"		
Value if input ON	▪ value 0 ▪ **value 1**	Setting the value to be sent when input value is "ON".
Value if input OFF	▪ **value 0** ▪ value 1	Setting the value to be sent when input value is "OFF".
If "Datapoint type for output" → „scene number"		
Scene number if input ON	1 – 64 **[1]**	Setting the scene to be sent when input value is "ON"..
Scene number if input OFF	1 – 64 **[2]**	Setting the scene to be sent when input value is "OFF".

ETS Text	Dynamic range **[Default value]**	Comment
If "Datapoint type for output" → „decimal value (0...255)"		
Value if input ON	0 ... 255 **[255]**	Setting the value to be sent when input value is "ON".
Value if input OFF	0 ... 255 **[1]**	Setting the value to be sent when input value is "OFF".
If "Datapoint type for output" → „percent value (0...100 %)"		
Percent value if input ON	0 – 100 % **[100 %]**	Setting the value to be sent when input value is "ON".
Percent value if input OFF	0 – 100 % **[0 %]**	Setting the value to be sent when input value is "OFF".
Lock / Release		
Lock / Enabling	▪ **not active** ▪ lock at value 1 ▪ enabling at value 1	Setting whether and when the value "1" lock or release the function.

Table 120: Setting – Time functions

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Time function Input	1 Bit	Input object as trigger signal.
1	F1: – Time function Output	1 Bit 1 Byte	Output object of the function.
8	F1: – Logic Lock	1 Bit	Lock object for the logic.
8	F1: – Logic Enabling	1 Bit	Release object for the logic.
+10	**next function**		

Table 121: Communication objects – Time functions

5.16 Follow-up control with ventilation

This function includes an on/off delay with integrated increase of a control value for increasing and later switching back a fan speed.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Time base for switching on	■ **second** ■ minute ■ hour	Setting the time base.
Switching on delay	1 … 240 **[10]**	Setting the time value. Unit according to the time base.
Time base for switching off	■ **second** ■ minute ■ hour	Setting the time base.
Switching off delay	1 … 240 **[1]**	Setting the time value. Unit according to the time base.
Datapoint type for output	■ **DPT1.001 On/Off** ■ DPT 17.001 scene number ■ DPT 5.005 1Byte decimal value (0…255) ■ DPT 5.001 1 Byte percent value (0…100%)	Setting the datapoint type of the output object.
If “Datapoint type for output” → „On/Off“		
Value if input ON	■ value 0 ■ **value 1**	Setting the value to be sent when input value is “ON”.
Value if output OFF	■ **value 0** ■ value 1	Setting the value to be sent when input value is “OFF”.
If “Datapoint type for output” → „scene number“		
Scene number if input ON	1 – 64 **[1]**	Setting the scene to be sent when input value is “ON”.
Scene number if output OFF	1 – 64 **[2]**	Setting the scene to be sent when input value is “OFF”.
If “Datapoint type for output” → „decimal value (0…255)“		
Value if input ON	0 … 255 **[255]**	Setting the value to be sent when input value is “ON”.
Value if output OFF	0 … 255 **[1]**	Setting the value to be sent when input value is “OFF”.

ETS Text	Dynamic range **[Default value]**	Comment
If "Datapoint type for output" → „percent value (0...100 %)"		
Percent value if input ON	0 – 100 % **[100 %]**	Setting the value to be sent when input value is "ON".
Percent value if output OFF	0 – 100 % **[0 %]**	Setting the value to be sent when input value is "OFF".
Ventilation control		
Ventilation control	■ **not active** ■ active	Determines whether a control value should be raised.
Input value	■ Byte value in steps ■ **value in %**	Defines the format of the control value to be raised.
If „Input value" → „Byte value in steps"		
Increase by	■ **1 level** ■ 2 level ■ 3 level	Number of levels by which the "Ventilation input" object should be raised.
Maximum value of output	3 – 8 **[8]**	Maximum level of the ventilation fan.
If „Input value" → „value in %"		
Increase by	5 – 50 % **[20 %]**	Percentage by which the "Ventilation input" object should be raised.
Maximum value of output	50 – 100 % **[100 %]**	Maximum percentage to which the value of the output object can be increased.
Lock / Release		
Lock / Enabling	■ **not active** ■ lock at value 1 ■ enabling at value 1	Setting whether and when the value "1" lock or release the function.

Table 122: Setting – Follow-up control with ventilation

Functional description "Switch on":

- The value of the "Ventilation input" object is written to the "Ventilation output" object.
- After a "1" has been written to the "Follow-up control input" object, a switch-on delay starts.
- At the end of the switch-on delay, the value defined for "On" is written to the "Time function output" object.
- The "Ventilation output" object is increased by the set value (number of levels or percentage).

Functional description “Switch off”:

- After a “0” has been written to the “ Follow-up control input” object, a switch-off delay starts.
- At the end of the switch-off delay, the value defined for “0” is written to the “Time function output” object.
- The “Ventilation output” object is reduced by the set value (number of levels or percentage).

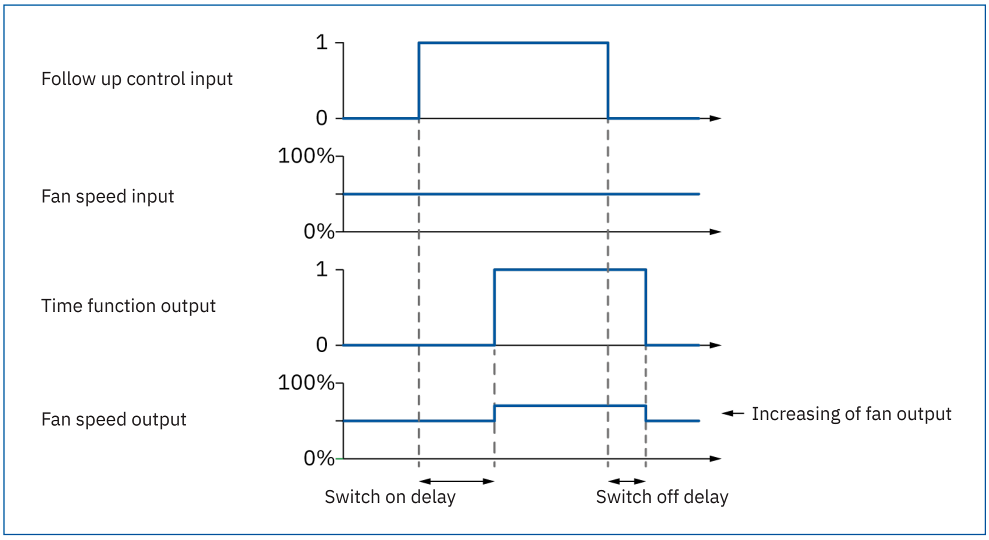


Figure 17: Diagram – Follow-up control with ventilation

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – Follow up control Input	1 Bit	Input object for starting the function.
1	F1: – Time function Output	1 Bit 1 Byte	Output object for switching operation.
4	F1: – Ventilation Input	1 Byte	Basic value for speed control.
5	F1: – Ventilation Output	1 Byte	Working value speed control.
8	F1: – Logic Lock	1 Bit	Lock object for the logic.
8	F1: – Logic Enabling	1 Bit	Release object for the logic.
+10	**next function**		

Table 123: Communication objects –Follow-up control with ventilation

5.17 Converting to PWM

This function is used to generate a pulse width modulated 1 Bit object from a control value (0-100%).

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
Invert output	▪ **no** ▪ yes	Inverts the value of the output. „0 → 1“; „1 → 0“
Time base	▪ **second** ▪ minute ▪ hour	Setting the time base.
Time	1 ... 240 s **[10 s]**	Setting the time value. Unit according to the time base.
Lock / Enabling	▪ **not active** ▪ lock at value 1 ▪ enabling at value 1	Setting whether and when the value “1” lock or release the function.

Table 124: Setting – Main functions: Converting to PWM

Functional description:

The switch-on time and the switch-off time of the output object are calculated based on the “Time base” and the “Time”.

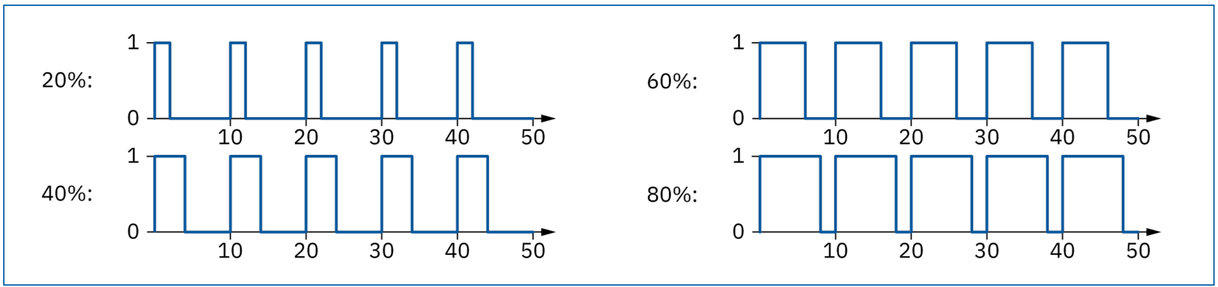


Figure 18: Diagram – Converting to PWM

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
0	F1: – PWM Input	1 Byte	Input object as reference variable.
1	F1: – PWM Output	1 Bit	Output object as a pulse modulated signal.
8	F1: – Logic Lock	1 Bit	Lock object for the logic.
8	F1: – Logic Enabling	1 Bit	Release object for the logic.
+10	**next function**		

Table 125: Communication objects – Converting to PWM

6 LED

The logic module features 4 LEDs on the front that can be freely switched via external or internal objects.

The following table shows the available settings:

ETS Text	Dynamic range **[Default value]**	Comment
LED 1	▪ **not active** ▪ switch via external object ▪ switch via internal object	Setting how the LED should be activated.
Select internal object	0 ... 254 **[0]**	Internal object for activating LED 1. **If "LED 1" → "Switch via internal object.**
Behaviour	▪ **permanent** ▪ blinking	Specifies whether the LED should flash or light up permanently.
State	▪ LED On at value = 1 ▪ LED On at value = 0 (inverted	Inverting the LED input object.
The settings for LED 2 up to LED 4 have the same behaviour as the settings for LED 1		

Table 126: Setting – LED

The following table shows the associated communication objects:

No.	Name / Object function	Length	Usage
240	LED 1 – Switch	1 Bit	Input object for switching LED 1
241	LED 2 – Switch	1 Bit	Input object for switching LED 2
242	LED 3 – Switch	1 Bit	Input object for switching LED 3
243	LED 4 – Switch	1 Bit	Input object for switching LED 4

Table 127: Communication objects – LED

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7.1 List of figures

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7.2 List of tables

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8 Appendix

8.1 Statutory requirements

The devices described above must not be used in conjunction with devices which directly or indirectly serve human, health, or life-safety purposes. Furthermore, the devices described must not be used if their use may cause danger to people, animals, or property.
Do not leave the packaging material carelessly lying around. Plastic foils/ bags etc. can become a dangerous toy for children.

8.2 Disposal

Do not dispose of the old devices in the household waste. The device contains electrical components that must be disposed of as electronic waste. The housing is made of recyclable plastic.

8.3 Assembly

Danger to life from electric current!

The device may only be installed and connected by qualified electricians. Observe the country-specific regulations and the applicable KNX guidelines

The devices are approved for operation in the European Union and in the United Kingdom. The products are respectively marked with the CE and UKCA symbols.

Use in the USA and Canada is prohibited!

8.4 History

V 1.0	First Version of Technical Manual	DB V 2.0	03/2025