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## Contents

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This manual describes the function and configuration of the Logic Module LM/S. Subject to alterations and errors excepted.

**Exclusion of liability:**

Although the contents of this document have been checked to ensure that they are consistent with the hardware and software, deviations cannot be completely excluded.

We therefore cannot accept liability. Any necessary corrections will be incorporated in new versions of the manual.

Please inform us of any suggested improvements.

As at: March 2004

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## 1 General

### 1.1 About this manual

This manual will provide support for carrying out the commissioning of the Logic Module LM/S.

The manual is directed at the commissioning engineer of the Logic Module. All the necessary steps for the initial commissioning stage are explained and the available functions are described.

This manual is divided into the following sections:

- Description of the device technology (Chapter 2)
- Installation (Chapter 3)
- Operation (Chapter 4)
- Commissioning (Chapter 5)
- Planning and application (Chapter 6)
- Appendix (Chapter 7)

### 1.2 Product and functional overview

Every EIB installation has its own requirements. The Logic Module LM/S makes 12 different functions available in one device for special logic operations between sensors and actuators.

Each LM/S can carry out 3 of the following functions simultaneously:

- Format converter
- Logic gates
- Min./Max. value indication
- Threshold values
- Scenes
- Gate/filter
- Staircase light
- Time delay
- Temperature comparator
- Multiplier
- Toggle value
- Counter

## 2 Device technology

The device functions of the LM/S 1.1 are described in this section.

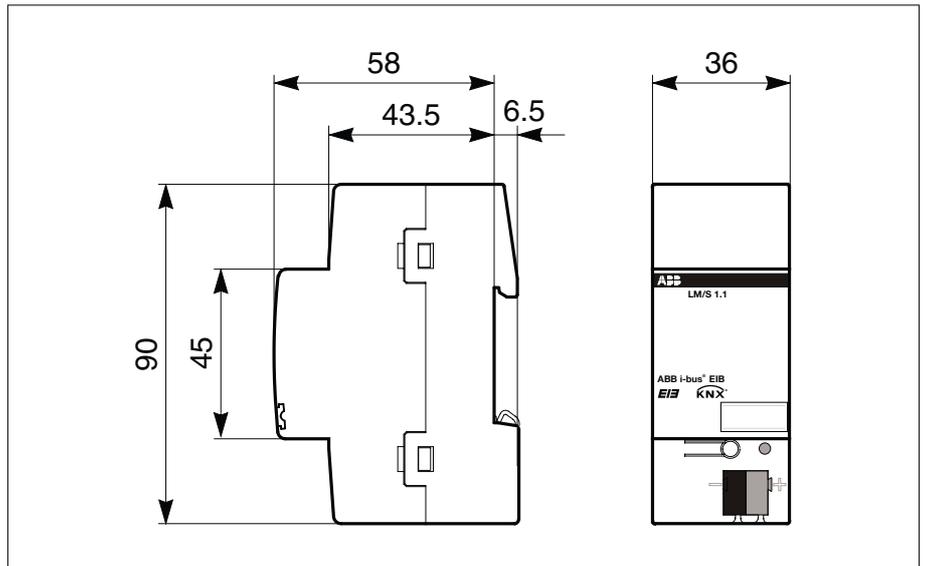
### 2.1 Technical data

<b>Power supply</b>	– Operating voltage	21...30 V DC, via the EIB
	– Power consumption	typ. 8 mA
	– Leakage loss	max. 200 mW
<b>Operating and display elements</b>	– Red LED and push button	For programming the physical address
<b>Connections</b>	– EIB	Bus connection terminal (black/red)
<b>Type of protection</b>	– IP 20, EN 60 529	
<b>Ambient temperature range</b>	– Operation	– 5 °C ... + 45 °C
	– Storage	– 25 °C ... + 55 °C
	– Transport	– 25 °C ... + 70 °C
<b>Design</b>	– Modular installation device, proM	
<b>Housing, colour</b>	– Plastic housing, grey	
<b>Installation</b>	– on 35 mm mounting rail, DIN EN 60 715	
<b>Dimensions</b>	– 90 x 36 x 64 mm (H x W x D)	
<b>Mounting depth/width</b>	– 68 mm/2 modules at 18 mm	
<b>Weight</b>	– 0.07 kg	
<b>Mounting position</b>	– As required	
<b>Approval</b>	– EIB- and KNX-certified	
<b>CE norm</b>	– in accordance with the EMC guideline and the low voltage guideline	

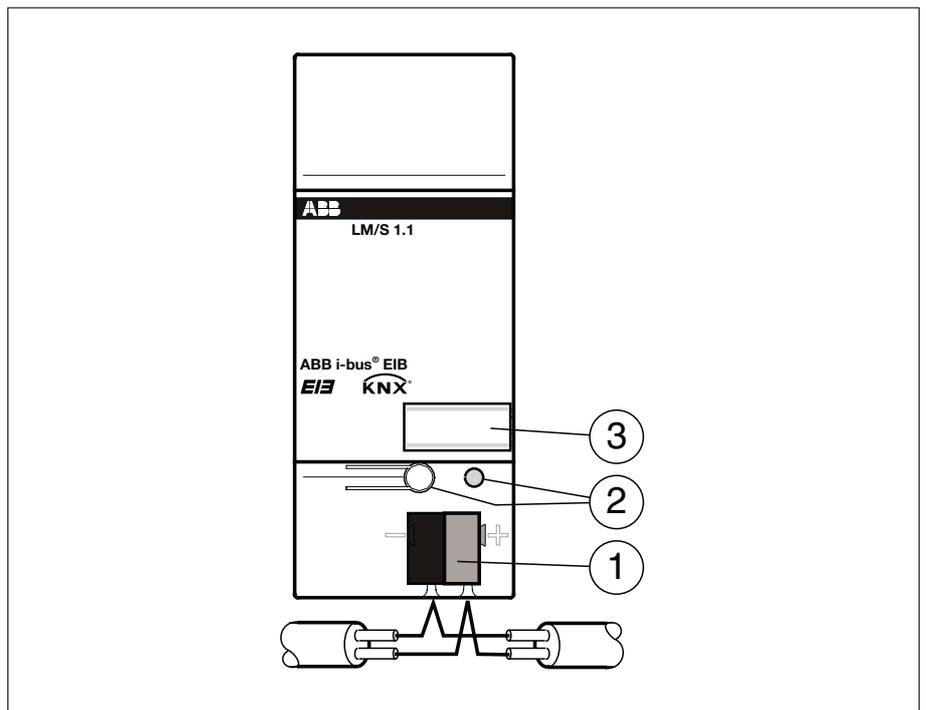
### Application program

	Number of communication objects	Max. number of group adresses	Max. number of associations
Logic Threshold Scene/1	Dependent on the functions used	250	250

2.2 Dimension drawing



2.3 Device connection



1 Bus connection terminal  
2 Programming button/LED

3 Designation plate

2.4 Description of the connections

**EIB connection**

The bus connection terminal supplied with the device is used for the connection of the EIB.



ETS V1.2a (or higher) is necessary for programming.

**3 Assembly and installation**

**Mounting the LM/S**

First mount the Logic Module onto a suitable DIN rail.

**Creating a bus connection**

Use the supplied bus connection terminal for the connection to the EIB.

**4 Function and operation**

**4.1 Operating elements**

There are no operating elements on the Logic Module for the user. The push button for changing to programming mode is only required for the commissioning phase.

**4.2 Display elements**

There are no display elements on the Logic Module for the user. The red LED indicates when the device is in programming mode (once the programming button has been pressed).

## 5 Commissioning

**5.1 Commissioning requirements** To commission the LM/S, you require a PC with the Engineering Tool Software ETS (from ETS2 V1.2a onwards) and an interface to the EIB (e.g. via ABB RS 232 interface EA/S 232.5).

**5.1.1 Supplied state** The LM/S is supplied with the physical address 15.15.255.

**5.2 Parameterisation in ETS** The parameterisation of the LM/S is carried out with the Engineering Tool Software ETS (from ETS2 version 1.2a onwards). The selection of the function(s) of the Logic Module is carried out in the ETS parameter window. Each Logic Module can carry out 3 different functions. It is possible to select from the following functions:

Function	Number per function
Format converter	1
Logic gate	1
Min./Max. value indication	1
Threshold values	1
Scenes	1 (1 x 8)
Gate/filter	2
Staircase light	2
Temperature comparator	1
Multiplier	1
Toggle value	1
Counter	1
Timing delay	4

The following applies for all parameter windows and functions:

### Behaviour of the inputs

On receipt of a telegram, all the inputs first of all save the values so that they are then statically available for further processing (e.g. for logic functions). When a new telegram is received at the input, the values are overwritten.

### Disable objects

Disable objects always block the function on receipt of an "ON" telegram at the communication object "xx Disable xx". The function is enabled on receipt of an "OFF" telegram at the communication object "xx Disable xx".

**Send delay**

The send delay indicates how long the LM/S waits (dependent on the parameterised send condition) before it sends a new value as an output telegram.

**Cyclical sending**

Some functions of the LM/S enable the cyclical sending of an output value. The set cyclic interval is then maintained until an output value changes.

When a value is changed, the output is sent immediately and the next transmission cycle is started.

**Data types and EIS types**

In some functions of the LM/S, various data types can be selected.

The EIS type (EIB Interworking Standard) is given where applicable. A table can be found in the appendix (chapter 7.1) which provides an overview of the association.

**5.2.1 'General' window**

It can be parameterised in the 'General' parameter window which functions the LM/S should carry out.

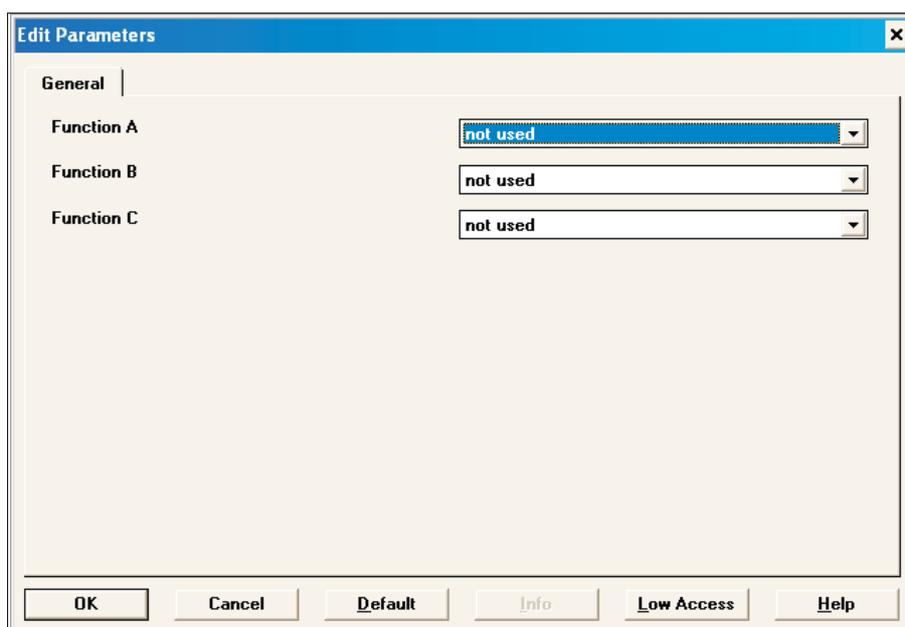


Diagram 5.2.1: 'General' tab in the default setting

If e.g. *Logic* is selected for 'Function A', an additional tab 'A – Logic' appears. If e.g. *Time delay* is selected for 'Function B', an additional tab 'B – Time delay' is created etc. A maximum of 3 functions are possible (A, B, C).

**5.2.2 Format converter function**

If the *Format converter* function is selected in the 'General' window, a further tab appears in the ETS parameter window. The name of the tab always precedes the function that has been selected (e.g. A – Format converter).

Using the format converter, data (e.g. 1-byte values) can be converted into another format (e.g. 8 x 1-bit).



The format converter function breaks down an input telegram into several output telegrams of a different format or generates an output telegram out of several input telegrams of a different format.

This means that telegrams are broken down or assembled on the format level. It is therefore not possible to assign a specific EIS type to input and output objects.

An association between an object and an EIS type only arises in the context of the ETS project in which this function is used.

In the event of bus voltage failure or when the LM/S is reprogrammed, the input values are not saved.

**5.2.2.1 Tab: 'X – Format converter'**

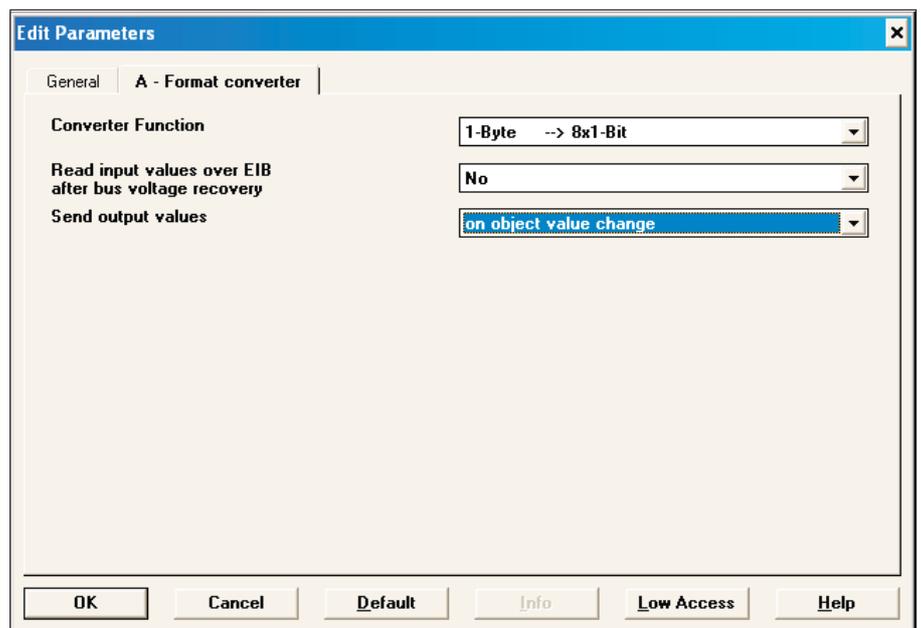


Diagram 5.2.2.1: 'A - Format converter' tab in the default setting

**Converter Function**

Optionen:	2 x 1-Bit	-> 1 x 2-Bit
	8 x 1-Bit	-> 1-Byte
	1 x 1-Byte	-> 2-Byte
	2 x 1-Byte	-> 2-Byte
	2 x 2-Byte	-> 4-Byte
	1 x 2-Bit	-> 2 x 1-Bit
	<b>1-Byte</b>	<b>-&gt; 8 x 1-Bit</b>
	2-Byte	-> 2 x 1-Byte
	4-Byte	-> 2 x 2-Byte

Under *Converter Function*, it is possible to select first of all which data types should be transferred into each other. The general rule applies: The first bit/byte (0) always has the lowest value while the last bit/byte (e.g. 7) has the highest value. The following example shows the conversion from 1 byte to 8 x 1 bit:

Input:

Byte value: 9

Output:

← Direction for reading							
$2^7$	$2^6$	$2^5$	$2^4$	$2^3$	$2^2$	$2^1$	$2^0$
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0	0	0	1	0	0	1

The conversion from 8 x 1 bit to 1 byte works in the same way.

The conversion from 1 x 1 byte to 1 x 2 byte represents a special case. The input byte in (EIS6) format is transferred into a 2 byte value (EIS10). With this conversion, it is possible to combine the 1 byte output of the ABB EIB Current Module with the 2 byte input value of the analogue actuator.

#### Read input values over EIB after bus voltage recovery

Options:        **No**  
                    Yes

Since not all telegrams are generally sent immediately to the inputs after a bus voltage recovery, it is possible in this case to read out the value via the bus in order to put the input in a defined state.

If this parameter is set to 'Yes', the LM/S waits 5 seconds after starting up and then sends corresponding read telegrams to the linked group addresses.

#### Send output values

Options:        **on reception of new telegram**  
                    on object value change

Under *Send output value*, you can select when an output telegram should be sent. If you select 'on object value change', an output telegram is only sent if the value of the output has changed e.g. from 0 to 1. If you would like the output to be sent after each receipt of a telegram at one of the inputs, you must set the option 'on reception of new telegram'. In this case, an output telegram is also sent when the value of the output has not been changed.

5.2.2.2 Communication objects:  
‘Format converter’

←	0	Receive telegram	A:Format converter input Byte	1 Byte	Low
→	8	Send telegram	A:Format converter output Bit 1	1 Bit	Low
→	9	Send telegram	A:Format converter output Bit 2	1 Bit	Low
→	10	Send telegram	A:Format converter output Bit 3	1 Bit	Low
→	11	Send telegram	A:Format converter output Bit 4	1 Bit	Low
→	12	Send telegram	A:Format converter output Bit 5	1 Bit	Low
→	13	Send telegram	A:Format converter output Bit 6	1 Bit	Low
→	14	Send telegram	A:Format converter output Bit 7	1 Bit	Low
→	15	Send telegram	A:Format converter output Bit 8	1 Bit	Low

Diagram 5.2.2.2

Diagram 5.2.2.2 displays the communication objects when the *Format converter* function (1-Byte -> 8 x 1-Bit) has been selected for function A.

5.2.3 Logic function

If the *Logic* function is selected in the ‘General’ window, 3 further tabs appear in the ETS parameter window. The name of the tab always precedes the function that has been selected (e.g. A – Logic Inp. 1 – 4).

Logic gates can be used to logically process states of the EIB installation which are reported via telegrams. For example, an output can only be sent from an AND gate if the input for twilight = 1 and the input for movement = 1. A change in the input signal causes the output to be sent (depending on the parameter settings). The input values are stored on bus voltage failure (if parameterised). When the LM/S is reprogrammed, the stored input values are always deleted.

5.2.3.1 Tab: ‘X – Logic Inp. 1 – 4’

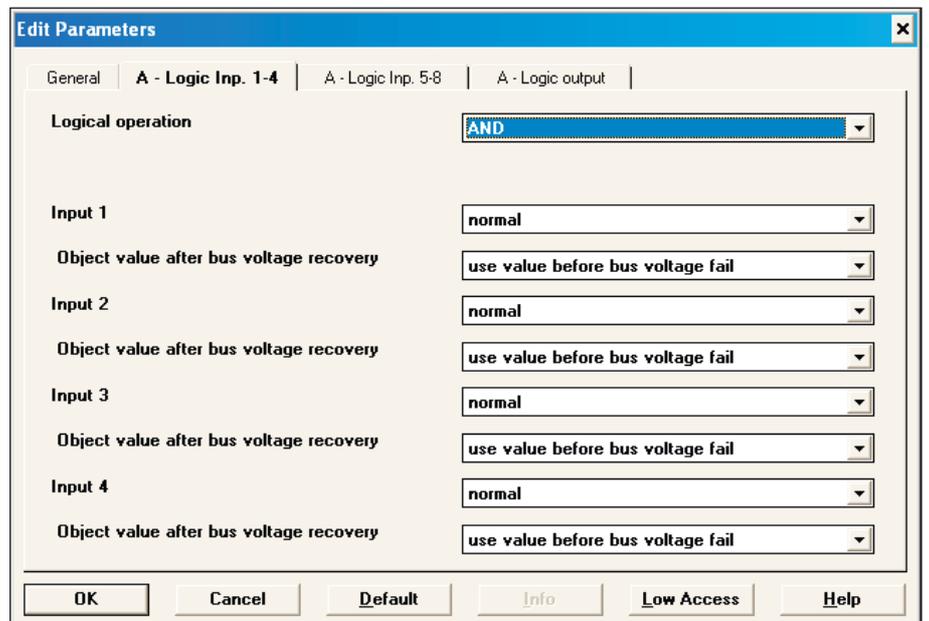


Diagram 5.2.3.1: ‘A - Logic Inp. 1 – 4’ tab in the default setting

**Logical operation**

Options:     **AND**  
              OR  
              Exclusive OR  
              NAND  
              NOR  
              Equivalence

Under Logical operation, you can select which type of logic gate you wish to use. In the setting 'AND' for example, a telegram is only sent at the output if all the inputs have sent an ON telegram. You can find a truth table for all the functions in the appendix (Chapter 7.2).

**Input x**

Options:     **normal**  
              not used  
              inverted

You can select for each of the 8 inputs ( $x = 1 \dots 8$ ), whether you wish to use the input normally, whether you wish to invert the input or whether you do not want to use the input. You can e.g. also create an AND gate with only 2 inputs and 1 output.

**Object value after bus voltage recovery**

Options:     **use value before bus voltage fail**  
              read values over EIB  
              use 0 as preset  
              use 1 as preset

Since not all telegrams are generally sent immediately to the inputs after a bus voltage recovery, it is possible in this case to use either 'use value before bus voltage fail' or 'read values over EIB' in order to put the input in a defined state. It is also possible to select 'use 0 as preset' or 'use 1 as preset' to define the input.

**5.2.3.2 Tab: 'X – Logic Inp. 5 – 8'**

On this page, you can find the settings for inputs 5 to 8 which you can set according to the description in section 5.2.3.1.

5.2.3.3 Tab: 'X – Logic output'

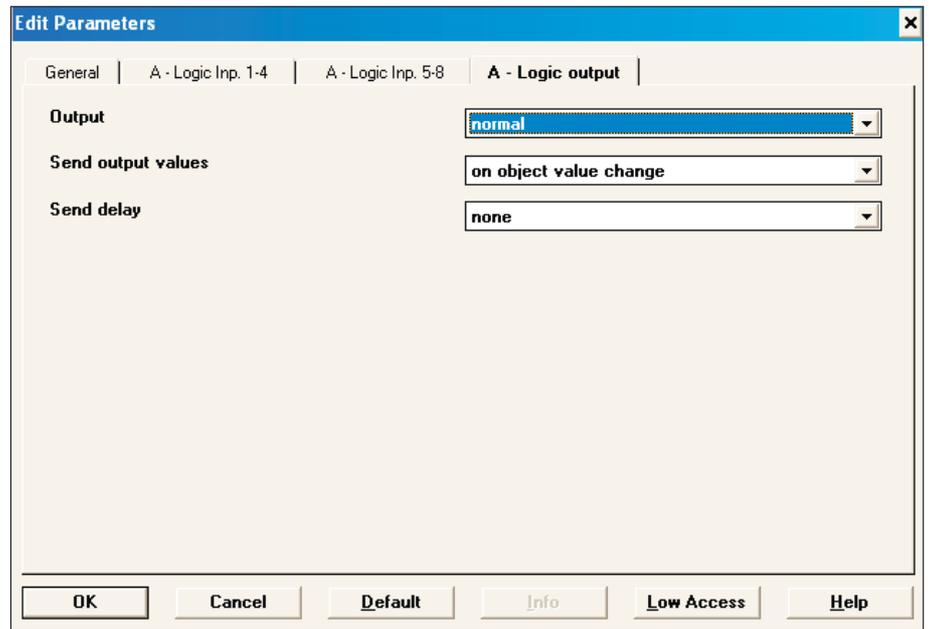


Diagram 5.2.3.3: 'A - Logic output' tab in the default setting

**Output**

Options:            **normal**  
                          inverted

You can select for the output whether you wish to use it normally or invert it.

**Send output values**

Options:            on object value change  
                          **on reception of new telegram**  
                          cyclic

Under *Send output values*, you can select when an output telegram should be sent. If you select 'on object value change', an output telegram is only sent if the value of the output has changed e.g. from 0 to 1. If you would like the output to be sent after each receipt of a telegram at one of the inputs, you must set the option 'on reception of new telegram'. In this case, an output telegram is also sent when the value of the output has not been changed. If the setting 'cyclic' is selected, the further parameters for base and factor appear to set the cyclic interval for the cyclical sending.

**Send delay**

Options:            **none**  
                          100 ms  
                          1 s  
                          10 s  
                          1 min  
                          10 min  
                          1 h

The send delay indicates how long the LM/S waits before it sends a new value as an output telegram. Only if the value has not changed during the set period is the output telegram sent. As soon as a base for the send delay has been selected, the additional parameter *Send delay factor* appears.

**Send delay factor**

Options: 1...255

With the parameter *Send delay factor*, you indicate which number between 1 and 255 the *Send delay base* should be multiplied by in order to set the total send delay period.

**Cyclical sending base**Options: 1 s  
10 s  
**1 min**  
10 min  
1 h

By selecting the parameter *Cyclical sending base*, you indicate the time which should be used as a base for the cyclical sending.

**Cyclical sending factor**

With the parameter *Cyclical sending factor*, you indicate which number between 1 and 255 the *Cyclical sending base* should be multiplied by in order to set the total period for cyclical sending.

**5.2.3.4 Communication objects:  
Logic**

	0	Receive telegram	A:Logic input 1	1 Bit	Low
	1	Receive telegram	A:Logic input 2	1 Bit	Low
	2	Receive telegram	A:Logic input 3	1 Bit	Low
	3	Receive telegram	A:Logic input 4	1 Bit	Low
	4	Receive telegram	A:Logic input 5	1 Bit	Low
	5	Receive telegram	A:Logic input 6	1 Bit	Low
	6	Receive telegram	A:Logic input 7	1 Bit	Low
	7	Receive telegram	A:Logic input 8	1 Bit	Low
	8	Send telegram	A:Logic output	1 Bit	Low

Diagram 5.2.3.4

Diagram 5.2.3.4 displays the maximum number of communication objects when the *Logic* function has been selected for function A.

The name of the communication objects of the respective function precede the designation of the function: x = [A, B, C] -> x corresponds to the function; Example: A: Logic input 1 for the first input of the logic gate of function A

**5.2.4 Min./Max. value indication  
function**

If the function *Min./Max. value indication* is selected in the 'General' window, a further tab appears in the ETS parameter window. The name of the tab always precedes the function that has been selected (e.g. A – Min./Max. value indication).

With the *Min./Max. value indication* function, the smallest temperature value for example is determined from the 4 telegrams that have been sent. This value can then be routed by various sensors as a measured value to a temperature controller.

5.2.4.1 Tab: 'X – Min./Max. value indication'

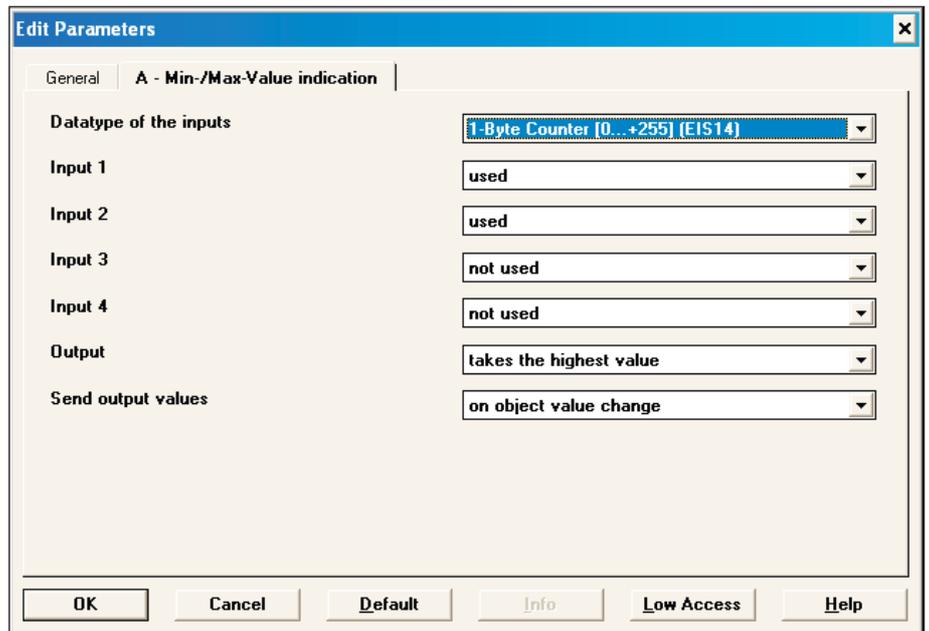


Diagram 5.2.4.1: 'A - Min./Max. value indication' tab in the default setting

**Data type of the inputs**

- Options:
- 1-Byte Value in % [0...100 %] (EIS6)
  - 1-Byte Orientation in degrees [0...360] (EIS6)
  - 1-Byte Counter [0... + 255] (EIS14)**
  - 1-Byte Counter [- 128... + 127] (EIS14)
  - 2-Byte Counter [0... + 65.535] (EIS10)
  - 2-Byte Floating point value (EIS5)
  - 2-Byte Counter [- 32.768... + 32.767] (EIS10)
  - 4-Byte Counter [0... + 4.294.967.295] (EIS11)
  - 4-Byte Floating point value (EIS9)
  - 4-Byte Counter [- 2.147.483.648... + 2.147.483] (EIS11)

The parameter *Data type of the inputs* defines how the values should be interpreted at the input of the LM/S. This setting applies to all 4 inputs.

**Input x**

- Options:
- used**
  - not used

You can define for each of the 4 inputs whether you wish to use it or not. In the default setting, the first two inputs are activated.

**Output**

- Options:
- takes the highest value**
  - takes the lowest value
  - takes the average value

You define how you wish the values of the inputs to be evaluated at the output. The highest/lowest value of the inputs can be issued or the arithmetical average.

**Send output values**

- Options:            on object value change  
                          **on reception of new telegram**  
                          cyclic

Under *Send output values*, you can select when an output telegram should be sent. If you select 'on object value change', an output telegram is only sent if the value of the output has changed e.g. from 0 to 1. If you would like the output to be sent after each receipt of a telegram at one of the inputs, you must set the option 'on reception of new telegram'. In this case, an output telegram is also sent when the value of the output has not been changed. If the setting 'cyclic' is selected, the further parameters for base and factor appear to set the cyclic interval for the cyclical sending.

**Cyclical sending base**

- Options:            1 s  
                          10 s  
                          **1 min**  
                          10 min  
                          1 h

By selecting the parameter *Cyclical sending base*, you indicate the time which should be used as a base for the cyclical sending.

**Cyclical sending factor**

With the parameter *Cyclical sending factor*, you indicate which number between 1 and 255 the *Cyclical sending base* should be multiplied by in order to set the total period for cyclical sending.

**5.2.4.2 Communication objects:  
 'Min./Max. value indication'**

	0	Receive telegram	A:MinMax input 1	1 Byte	Low
	1	Receive telegram	A:MinMax input 2	1 Byte	Low
	4	Send telegram	A:MinMax output	1 Byte	Low

Diagram 5.2.4.2

Diagram 5.2.4.2 displays the communication objects for the *Min./Max. value indication* function in the default setting.

**5.2.5 Threshold values function** If the function *Threshold values* is selected in the 'General' window, 2 further tabs appear in the ETS parameter window. The name of the tab always precedes the function that has been selected (e.g. A – Threshold value 1).

The function is used to detect an overrange or an underflow in a set threshold value. For example, the temperature of a cold-storage depot can be monitored for a maximum value and a signal can be sent when the temperature is exceeded (see example of a configuration 5.2.5.2).

**5.2.5.1 Tab: 'X – Threshold value y'** Each *Threshold values* function makes 2 independent threshold values available which can be parameterised in the tab 'Threshold value 1' (or 2).

Diagram 5.2.5.1: 'A - Threshold value 1' tab in the default setting

#### Data type of the input

Options:

- 1-Byte Value in % [0...100 %] (EIS6)
- 1-Byte Orientation in degrees [0...360] (EIS6)
- 1-Byte Counter [0... + 255] (EIS14)**
- 1-Byte Counter [- 128... + 127] (EIS14)
- 2-Byte Counter [0... + 65.535] (EIS10)
- 2-Byte Floating point value (EIS5)
- 2-Byte Counter [- 32.768... + 32.767] (EIS10)
- 4-Byte Counter [0... + 4.294.967.295] (EIS11)
- 4-Byte Floating point value (EIS9)
- 4-Byte Counter [- 2.147.483.648... + 2.147.483] (EIS11)

The parameter *Data type of the inputs* defines how the values should be interpreted at the input of the LM/S. This setting applies to all 4 inputs.

#### Threshold value

Under *Threshold value*, you enter the absolute value of the threshold value which the input should be monitored for.

**Bandwidth of the hysteresis in % of the threshold value [0...50 %]**

This parameter is used to set the hysteresis for the threshold value which is used as a bandwidth i.e. when 10 % is entered, the bandwidth should lie between –5 % and + 5 % at the threshold. The percentage value is therefore based on the threshold value itself.

**Send threshold object**

Options:           **if object value is out of bandwidth of hysteresis**  
                          on object value change

Under *Send threshold object*, you can select when an output telegram should be sent. If you select 'on object value change', an output telegram is only sent if the value of the output has changed e.g. from 0 to 1. If you would like the output to always be sent when the value lies outside the defined hysteresis bandwidth, use the setting 'if object value is out of bandwidth of hysteresis'.

**If value is above the upper border of hysteresis send**

Options:           no telegram  
                          **ON telegram**  
                          OFF telegram

This parameter defines whether the LM/S should send a telegram as soon as the value of the input signal exceeds the upper value of the hysteresis limit (see example 5.2.5.2).

**If value is below the lower border of hysteresis send**

Options:           no telegram  
                          **ON telegram**  
                          OFF telegram

This parameter defines whether the LM/S should send a telegram as soon as the value of the input signal falls below the lower value of the hysteresis limit (see example 5.2.5.2).

**Send delay**

Options:           **none**  
                          Base: 100 ms  
                          Base: 1 s  
                          Base: 10 s  
                          Base: 1 min  
                          Base: 10 min  
                          Base: 1 h

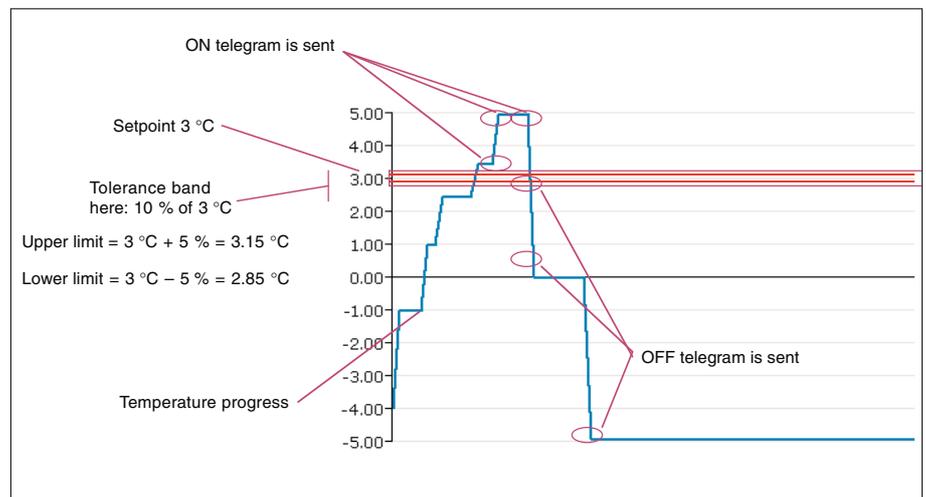
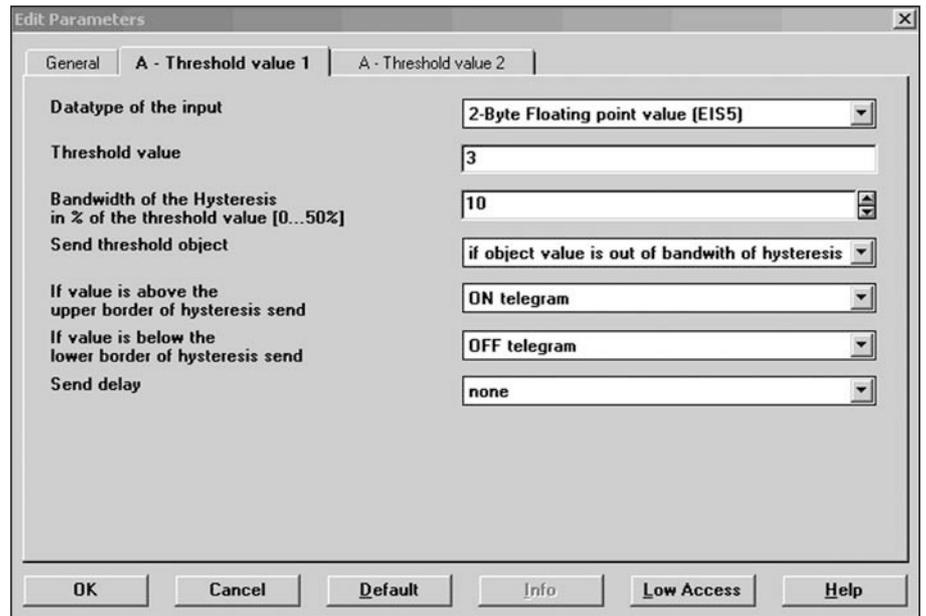
The send delay indicates how long the LM/S waits before it sends a new value as an output telegram. Only if the value has not changed during the set period is the output telegram sent. As soon as a base for the send delay has been selected, the additional parameter *Send delay factor* appears.

**Send delay factor**

Options:           1...255

With the parameter *Send delay factor*, you indicate which number between 1 and 255 the *Send delay base* should be multiplied by in order to set the total send delay period.

**5.2.5.2 Example of a configuration** The following parameter settings influence the behaviour of the Logic Module in accordance with the graphic below:



**5.2.5.3 Communication objects:  
Threshold values**

	0	Receive telegram	A:Threshold value input 1	2 Byte	Low
	1	Send telegram	A:Threshold value T.value 1	1 Bit	Low
	2	Receive telegram	A:Threshold value input 2	1 Byte	Low
	3	Send telegram	A:Threshold value T.value 2	1 Bit	Low

Diagram 5.2.5.3

Diagram 5.2.5.3 displays the communication objects for the *Threshold values* function in the default setting.

**5.2.6 Scenes function**

If the *Scenes function* is selected in the 'General' window, further tabs appear in the ETS parameter window. The name of the tab always precedes the function that has been selected (e.g. A – Scenes Common).

Scenes are used to retrieve preset options. There are 6 communication objects available as outputs. The data type is defined once for each output. Different values can then be assigned to these outputs in each scene.

It is possible for example to define a scene for a "Fireside evening" in a lounge. If this scene is recalled via a bus telegram, the preset values for the scene are sent as telegrams on the bus to the actuators. A standard lamp can then be switched on for example, the ceiling lights can be dimmed to 10 % and the heating setpoint reduced to 18 °C.

**5.2.6.1 Tab: 'X – Scenes Common'**

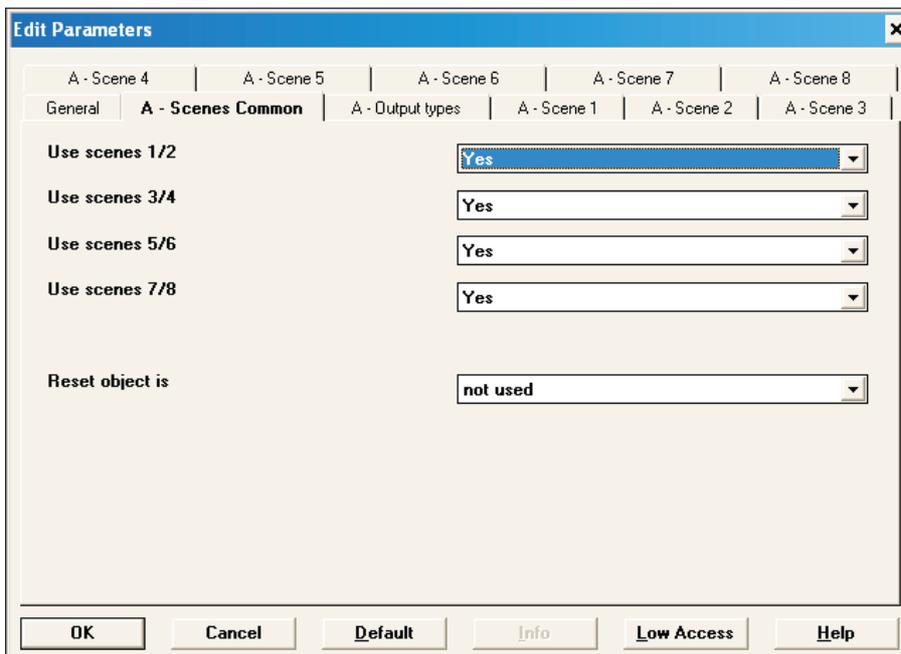


Diagram 5.2.6.1: 'A – Scenes Common' in the default setting

**Use scenes x/y**

Options:        **Yes**  
                   No

For each pair of scenes, you can select whether you wish to use these scenes. If the option 'Yes' is selected, the communication object *Scene call SxSy* is also visible with which the scenes can be retrieved via the bus. If 'No' is selected as the option, the corresponding object is not shown. The tabs of the *Scenes* function always remain visible in order to store the set parameter values.

**Reset object is**

Options:        **not used**  
                   used

The reset object is used to reset scenes to the setting which was parameterised with ETS and loaded into the LM/S. If you use the reset object, the additional communication object *Reset to preset* appears.

**5.2.6.2 Tab: 'X – Output types'**

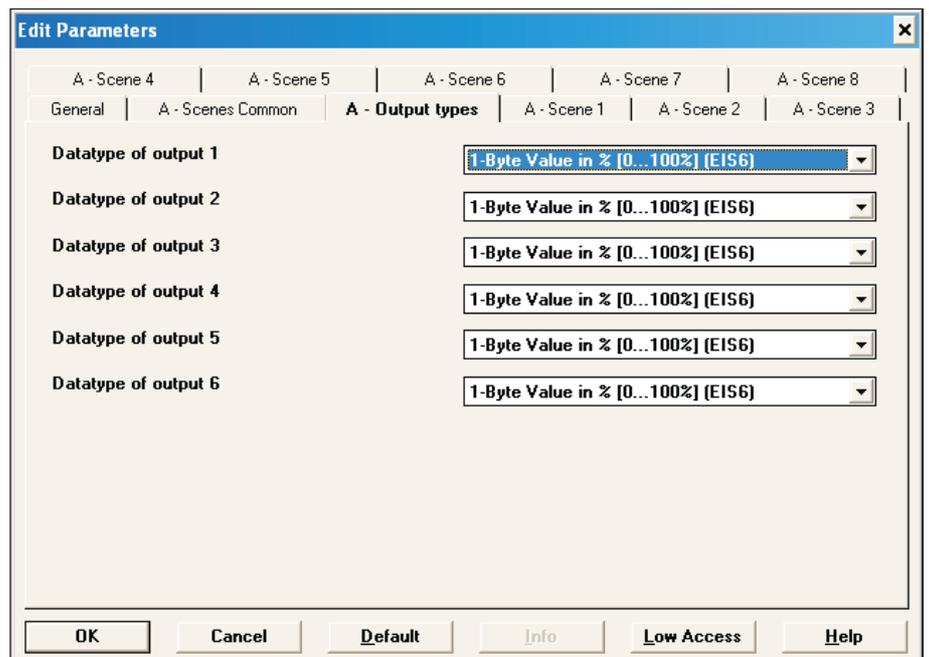


Diagram 5.2.6.2: 'A – Output types' in the default setting

**Data type of output x**

Options:        1-Bit Value (EIS1)  
                   **1-Byte Value in % (EIS6)**  
                   1-Byte Value [0...255]  
                   2-Byte Value [- 100... + 100] (EIS5)

You can select the data type for each of the 6 outputs. This setting influences the value which you can set in each scene for the corresponding output.

**5.2.6.3 Tab: 'X – Scene y'**

Each scene has its own tab for presetting the 6 outputs. Depending on the setting for *Data type of output x* in the tab *X – Output types*, the preset values for each output can now be entered.

**Preset output x**

The required preset value for each output is selected here. The data type of the output was defined in the tab *X – Output types* and is therefore preset for all the scenes.

If the data type of the output is a 1 bit value or 1 byte percentage value, you can also use the option 'no reaction'. In this setting, the corresponding output does not change when the scene is retrieved.

**Delay between sending the output telegrams**

Options:        **none**  
                  Base: 100 ms  
                  Base: 1 s  
                  Base: 10 s  
                  Base: 1 min  
                  Base: 10 min  
                  Base: 1 h

With this parameter, you can define whether and how long the individual outputs should be controlled with a delay. This can be used to slowly build up scenes and thus achieve additional effects. If a base between 100 ms and 1 h is selected, the parameter *Factor [1...255]* also appears.

**Factor [1...255]**

Options:        1...255

With this parameter, you indicate the number between 1 and 255 which the *Delay between sending the output telegrams* should be multiplied by in order to set the total delay period.

### 5.2.6.4 Communication objects: Scenes

	0	Send telegram	A:Scene output 1	1 Byte	Low
	1	Send telegram	A:Scene output 2	1 Byte	Low
	2	Send telegram	A:Scene output 3	1 Byte	Low
	3	Send telegram	A:Scene output 4	1 Byte	Low
	4	Send telegram	A:Scene output 5	1 Byte	Low
	5	Send telegram	A:Scene output 6	1 Byte	Low
	6	OFF = Sc 1, ON = Sc 2	A:Scene call S1S2	1 Bit	Low
	7	OFF = Sc 3, ON = Sc 3	A:Scene call S3S4	1 Bit	Low
	8	OFF = Sc 5, ON = Sc 6	A:Scene call S5S6	1 Bit	Low
	9	OFF = Sc 7, ON = Sc 8	A:Scene call S7S8	1 Bit	Low
	10	Programming mode on...	A:Scene Programming mode	1 Bit	Low
	11	Scene was stored	A:Scene Save indication	1 Bit	Low
	12	Receive telegram	A:Scene Reset to preset	1 Bit	Low

Diagram 5.2.6.4

Diagram 5.2.6.4 displays all the communication objects (CO) of the Scenes function. The number of COs applies when Scenes has been selected for function A.

The communication objects *Scene call SxSy* (6, 7, 8, 9) are used to recall the scenes. One communication object is used for 2 scenes. An OFF telegram at object no. 6 thus recalls scene 1. An ON telegram at the same object recalls scene 2.

Via the object *Programming mode* (10), scenes can be modified with the Logic Module. The sequence is as follows:

1. Set the scene in which all the actuators which are used in the scene are put into the required state.
2. Send an ON telegram to the CO *Programming mode*.
3. Select the scene which should be modified by sending an ON or OFF telegram to a recall object (e.g. an ON telegram to object 6 for scene 2).

The LM/S now reads in the current states of all 6 outputs (if used) via the bus.

If all outputs could be read and the new values have been adopted, an ON telegram is sent to the CO *Save indication* followed by an OFF telegram after a 2 second delay.

If all the outputs could not be read or if the save was not successful, the LM/S only sends an ON telegram to CO 11 to display that the programming was not successful.

When sending an OFF telegram to CO *Programming mode* (10), an OFF telegram is also sent by CO *Save indication* (11).

The current lightscene values and the values set via the ETS are stored in the non-volatile memory of LM/S.

If you wish to reset a modified lightscene to the values that were parameterised with ETS, use the CO *Reset to preset* (12). After sending an ON telegram to this CO, the LM/S sends an OFF telegram automatically after approx. 2 s and resets the scene that has just been selected to the values which were entered in the parameter window of the ETS program.



If the LM/S is loaded by the ETS, the values of the scenes that have been stored via the bus are overwritten with the values parameterised in the ETS.

### 5.2.7 Temperature comparator function

If the *Temperature comparator* function has been selected in the 'General' window, 1 further tab appears in the ETS parameter window.

2 temperature values can be compared with the temperature comparator. Various telegrams can be sent depending on the result.

#### 5.2.7.1 Tab: 'X – Temperature comparator'

Diagram 6.2.7.1: 'A – Temperature comparator' in the default setting

#### Temperature difference (+/-) in Kelvin

Options: 1.0 ... 10.0

This parameter indicates by how many Kelvin the two temperature values at the input must differ before a temperature difference is detected.

#### Output data type

Options: 1-Byte [0 ... + 255]  
 1-Byte [- 128 ... + 127]  
 2-Byte [0 ... + 65.535]  
 2-Byte [- 32.78 ... + 32.767]  
**1-Bit**

The parameter *Output data type* defines which values the LM/S should send as output telegrams.

### Send telegram if

Options:           Input 1 > Input 2  
                      Input 1 < Input 2  
                      **Inp. 1 > Inp. 2 and if Inp. 1 < Inp. 2**

With this parameter, you can define in which case the LM/S should send a telegram. In the default setting, a telegram is sent in both cases ('Inp. 1 > Inp. 2 and if Inp. 1 < Inp. 2').

### Send if input 1 > input 2

Options (dependent on parameter *Output data type*):

1 bit:             **ON telegram**  
                      OFF telegram  
Other values:    **0**  
                      Max. value of data type

With this parameter, you define which value the LM/S sends when the status 'Input 1 > Input 2' occurs.

### Send if input 1 < input 2

Options (dependent on parameter *Output data type*):

1 bit:             ON telegram  
                      **OFF telegram**  
Other values:    **0**  
                      Max. value of data type

With this parameter, you define which value the LM/S sends when the status 'Input 1 < Input 2' occurs.

### Send output values

Options:           on object value change  
                      **on reception of new telegram**  
                      cyclic

Under *Send output values*, you can select when an output telegram should be sent. If you select 'on object value change', an output telegram is only sent if the value of the output has changed e.g. from 0 to 1. If you would like the output to be sent after each receipt of a telegram at one of the inputs, you must set the option 'on reception of new telegram'. In this case, an output telegram is also sent when the value of the output has not been changed. If the setting 'cyclic' is selected, the further parameters for base and factor appear to set the cyclic interval for the cyclical sending.

**Cyclical sending base**

Options:      Base: 1 s  
                  Base: 10 s  
                  **Base: 1 min**  
                  Base: 10 min  
                  Base: 1 h

By selecting the parameter *Cyclical sending base*, you indicate the time which should be used as a base for the cyclical sending. The set interval is then retained until an output value changes. When a value changes, the output is sent immediately instead of waiting for the next sending cycle. After bus voltage recovery or a download, the cyclical sending is only carried out if at least one input value has been received.

**Cyclical sending factor**

Options:      1 ... 255

With the parameter *Cyclical sending factor*, you indicate which number between 1 and 255 the *Cyclical sending base* should be multiplied by in order to set the total period for cyclical sending.

### 5.2.7.2 Communication objects: Temperature comparator

	0	Input	A:T.Comparator input 1	2 Byte	Low
	1	Input	A:T.Comparator input 2	2 Byte	Low
	2	Output	A:T.Comparator output	1 Bit	Low

Diagram 5.2.7.2

Diagram 5.2.7.2 displays the communication objects of the *Temperature comparator* function in the default setting.

### 5.2.8 Gate/Filter function

If the *Gate/Filter* function is selected in the 'General' parameter window, 2 further tabs appear in the ETS parameter window, each with a gate/filter.

The filter function enables the filtering of telegrams. Using the gate, telegrams can be routed or blocked dependent on a condition.

**Note:**

The *Gate/Filter* function operates on the format level of telegrams (e.g. 1 bit, 1 byte, 2 bytes) and not of EIS types. An association between an object and an EIS type only arises in the context of the ETS project in which this function is used.

## 5.2.8.1 Tab: 'X – Gate/Filter y'

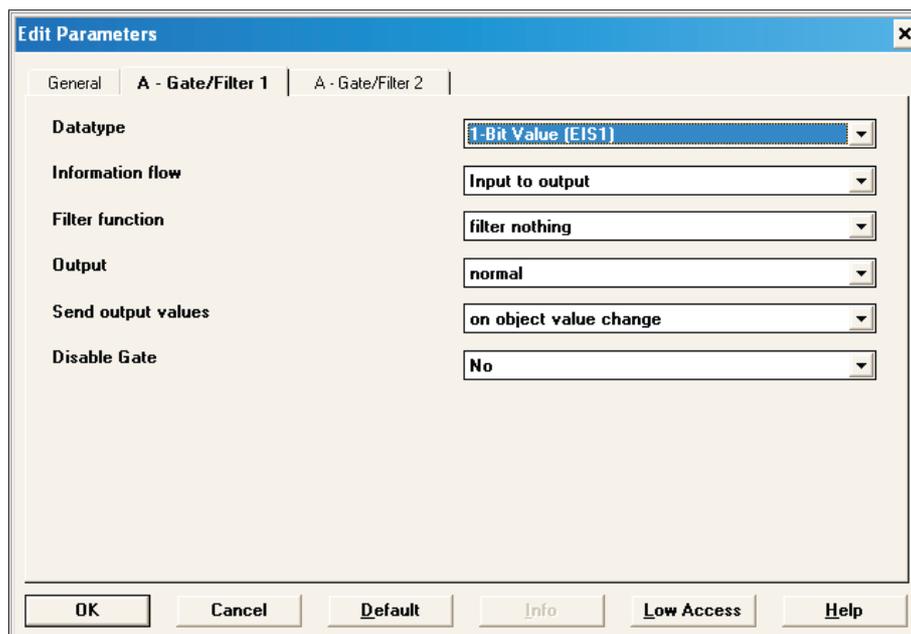


Diagram 5.2.8.1: 'A – Gate/Filter 1' in the default setting

**Data type**

Options:

- 1-Bit (EIS1)**
- 2-Bit
- 4-Bit
- 1-Byte (EIS6 / EIS14)
- 2-Byte (EIS5 / EIS10)
- 4-Byte (EIS9 / EIS11)

The parameter *Data type* determines which values should be used at the input and at the output of a gate/filter element.

**Information flow**

Options:

- Input to output**
- Output to input
- Both directions

With the parameter *Information flow*, you define in which direction the gate/filter element should be operated.

**Filter function**

This parameter is only available if the option '1-Bit (EIS1)' has been selected as the *Data type*.

Options:

- filter nothing**
- filter ON telegrams
- filter OFF telegrams

The parameter *Filter function* defines whether telegrams should be filtered out and which type. These telegrams are then not sent at the output of the LM/S.

**Output**

This parameter is only available if the option '1-Bit (EIS1)' has been selected as the *Data type*.

Options:           **normal**  
                          inverted

In the default setting, the output is set according to the input telegrams and the selected filter function. If you require an inversion, select the option 'inverted'.

**Send output values**

Options:           on object value change  
                          **on reception of new telegram**

Under *Send output values*, you can select when an output telegram should be sent. If you select 'on object value change', an output telegram is only sent if the value of the output has changed e.g. from 0 to 1. If you would like the output to be sent after each receipt of a telegram at one of the inputs, you must set the option 'on reception of new telegram'. In this case, an output telegram is also sent when the value of the output has not been changed.

**Disable gate**

Options:           **No**  
                          if disable = 1 (ON)  
                          if disable = 0 (OFF)

With *Disable gate*, you define whether the gate/filter element should receive a disable object or not. You can further select whether the disable function should be activated on receipt of an ON telegram (option 'if disable = 1 (ON)') or by an OFF telegram (option 'if disable = 0 (OFF)').



Note: The input value is not stored while the disable function is active.

**5.2.8.2 Communication objects:  
Gate/Filter**

	0	Receive telegram	A: Gate 1 input	1 Bit	Low
	1	Receive telegram	A: Gate 1 disable	1 Bit	Low
	2	Send telegram	A: Gate 1 output	1 Bit	Low
	3	Receive telegram	A: Gate 2 input	1 Bit	Low
	4	Receive telegram	A: Gate 2 disable	1 Bit	Low
	5	Send telegram	A: Gate 2 output	1 Bit	Low

Diagram 5.2.8.2

Diagram 5.2.8.2 displays the communication objects of the *Gate/Filter* function. The disable objects (no. 1 and 4) are only visible if the parameter *Disable gate* (see above) has been selected accordingly.

5.2.9 Staircase light function

If the *Staircase light* function is selected in the 'General' window, a further tab appears in the ETS parameter window which has 2 configurable staircase lights available.

The staircase light function imitates a staircase lighting timer. On receipt of an ON telegram, the delay period is started. Once the delay has elapsed, an OFF telegram is sent to the

5.2.9.1 Tab: 'X – Staircase light'

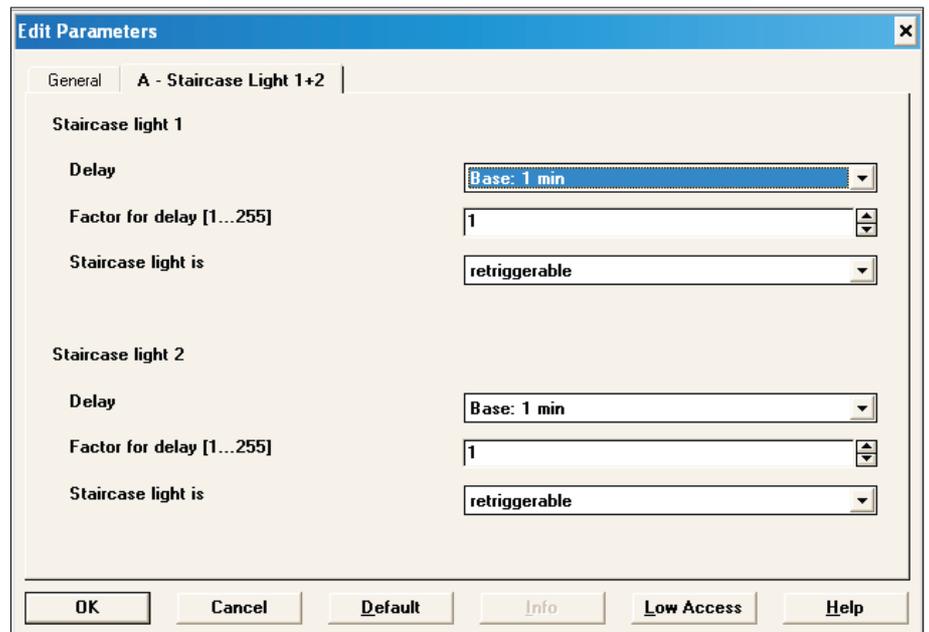


Diagram 5.2.9.1: 'A – Staircase light 1 + 2' in the default setting

**Delay**

- Options:
- Base: 100 ms
  - Base: 1 s
  - Base: 10 s
  - Base: 1 min**
  - Base: 10 min
  - Base: 1 h

The delay indicates how long the LM/S waits once it has received an ON telegram before it sends an OFF telegram to the group address(es) linked to the input.

**Factor for delay [1 ... 255]**

- Options: 1...255

With the parameter *Factor for delay*, you indicate which number between 1 and 255 the *Delay* should be multiplied by in order to set the total send delay period.

**Staircase light is**

Options:            **retriggerable**  
                          not retriggerable

With this parameter, you can set how the LM/S reacts to a new telegram during the delay period of the staircase light. In the default setting, it is 'retriggerable' i.e. if it receives a new ON telegram during the delay period, the delay period restarts. If 'not retriggerable' has been selected, the LM/S only reacts again to an ON telegram when the delay period has elapsed.

**5.2.9.2 Communication objects:  
 Staircase light**

	0	Send/receive telegram	A: Staircase light 1 input	1 Bit	Low
	1	Receive telegram	A: Staircase light 1 disable	1 Bit	Low
	2	Send/receive telegram	A: Staircase light 2 input	1 Bit	Low
	3	Receive telegram	A: Staircase light 2 disable	1 Bit	Low

Diagram 5.2.9.2

Diagram 5.2.9.2 displays the communication objects of the *Staircase light* function. The disable objects ('Staircase light x disable') are used to disable the function.

An ON telegram at the disable object causes the immediate blocking of the associated staircase light function. Any delay that is currently running is interrupted and no more OFF telegrams are sent to the staircase light input.

If the staircase light input is still set to ON when the disable object has been reset (OFF telegram), the delay is restarted.

### 5.2.10 Multiplier function

If the *Multiplier* function is selected in the 'General' window, 2 further tabs appear in the ETS parameter window.

The multiplier can be used to route several telegrams to the output on receipt of a telegram at the input. The output telegrams can be 4 x 1 bit and/or 4 x 1 byte telegrams.

#### 5.2.10.1 Tab: 'X – Multiplier 1-Bit'

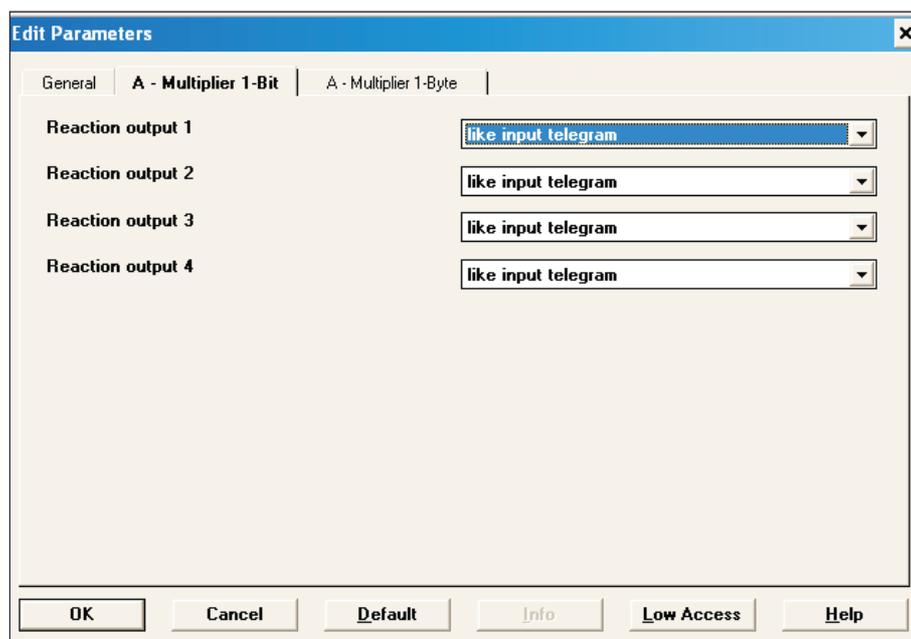


Diagram 5.2.10.1: 'A – Multiplier 1-Bit' in the default setting

#### Reaction output x

Options:

- like input telegram**
- like input telegram inverted
- send ON if ON received
- send OFF if ON received
- send OFF if OFF received
- send ON if OFF received

With the parameter *Reaction output x*, you define how a binary output of the multiplier should behave. The option 'like input telegram' corresponds to the function of the simple multiplier. You can however also invert or only react to one telegram. The option 'send ON if ON received' means that there is no reaction at the output on receipt of an OFF telegram.

## 5.2.10.2 Tab 'Multiplier 1-Byte'

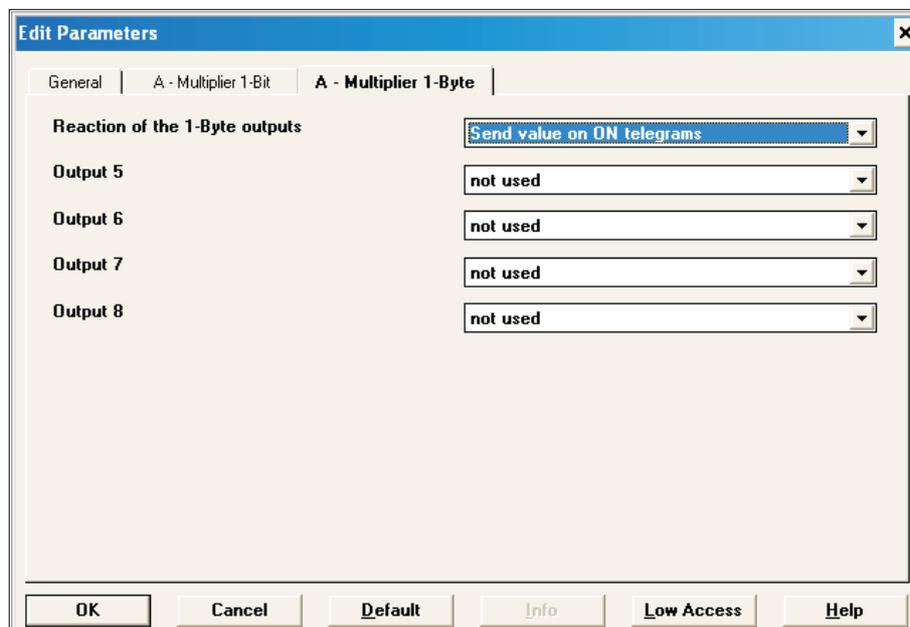


Diagram 5.2.10.2: 'A – Multiplier 1-Byte' in the default setting

**Reaction of the 1-Byte outputs**

Options:        **Send value on ON telegrams**  
                   Send value on OFF telegrams

This parameter defines for all 1 byte outputs (output 5 – 8) when these outputs send their values.

**Output x**

Options:        **not used**  
                   used

With the parameter *Output x*, the outputs can be activated (option 'used'). Once an output has been activated, the additional parameter *Value [0 ... 255]* appears.

**Value [0 ... 255]**

Options:        0 ... 255

With the parameter *Value [0 ... 255]*, you indicate which value between 0 and 255 should be sent as the output.

**5.2.10.3 Communication objects:  
Multiplier**

	0	Receive telegram	A:Multiplier input	1 Bit	Low
	1	Send telegram	A:Multiplier output 1	1 Bit	Low
	2	Send telegram	A:Multiplier output 2	1 Bit	Low
	3	Send telegram	A:Multiplier output 3	1 Bit	Low
	4	Send telegram	A:Multiplier output 4	1 Bit	Low
	5	Send telegram	A:Multiplier output 5	1 Byte	Low
	6	Send telegram	A:Multiplier output 6	1 Byte	Low
	7	Send telegram	A:Multiplier output 7	1 Byte	Low
	8	Send telegram	A:Multiplier output 8	1 Byte	Low

Diagram 5.2.10.3

Diagram 5.2.10.3 displays the communication objects of the *Multiplier* function with all possible objects. The communication objects of an output are only displayed if it is used.

**5.2.11 Toggle value function**

If the *Toggle value* function is selected in the 'General' window, a further tab appears in the ETS parameter window.

With this function, a preset setpoint value can be sent as a reaction to a 1 bit input telegram. It is therefore possible e.g. to preselect a setpoint value for the room temperature during while the occupant of a room is present (e.g. 20 °C) and during periods of absence (e.g. 16 °C).

**5.2.11.1 Tab 'X – Toggle value'**

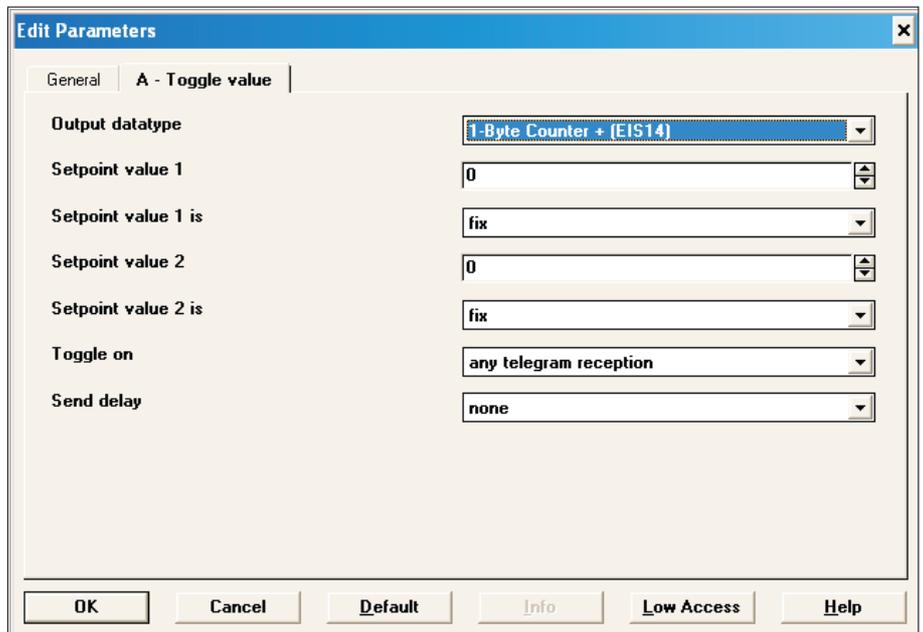


Diagram 5.2.11.1: 'A – Toggle value' in the default setting

**Output data type**

- Options:
- 1-Byte Value in % [0...100 %] (EIS6)
  - 1-Byte Orientation in degrees [0...360] (EIS6)
  - 1-Byte Counter [0... + 255] (EIS14)**
  - 1-Byte Counter [- 128... + 127] (EIS14)
  - 2-Byte Counter [0... + 65.535] (EIS10)
  - 2-Byte Floating point value (EIS5)
  - 2-Byte Counter [- 32.768... + 32.767] (EIS10)
  - 4-Byte Counter [0... + 4.294.967.295] (EIS11)
  - 4-Byte Floating point value (EIS9)
  - 4-Byte Counter [- 2.147.483.648... + 2.147.483] (EIS11)

The parameter *Output data type* defines which data type should be used for the output telegrams.

**Setpoint value x**

- Options: Count value (range is dependent on the *Output data type*)

As a setpoint, you enter one of the values which should be toggled to. Depending on the data type you have selected as the *Output data type*, you can enter values with the corresponding size.

**Setpoint value x is**

- Options: **fix**  
rewritable over EIB

With *Setpoint value x is*, you set whether the setpoint can only be set in the ETS parameter window (option: 'fix') or whether the setpoint is available as a communication object which can also be described (option: 'rewritable over EIB').

Even if the setpoint is fixed, the communication objects (3 + 4) *Save setpoints* and *Reset to preset appear*. These objects are not required when there is a fixed assignment of the setpoint values.

**Toggle on**

- Options: **any telegram receipt**  
ON telegrams only  
OFF telegrams only  
ON teleg. to value 1 / OFF teleg. to value 2

This parameter defines when the values should be toggled. In the default setting ('any telegram receipt'), it toggles between setpoint 1 and setpoint 2 – regardless of the type of telegram at the input. The option 'ON teleg. to value 1 / OFF teleg. to value 2' enables the defined switching to a value at ON or OFF.

**Send delay**

Options: **none**  
 Base: 100 ms  
 Base: 1 s  
 Base: 10 s  
 Base: 1 min  
 Base: 10 min  
 Base: 1 h

The send delay indicates how long the LM/S waits before it sends a new value as an output telegram. Only if the value has not changed during the set period is the output telegram sent. As soon as a base for the send delay has been selected, the additional parameter *Send delay factor* appears.

**Send delay factor [1 ... 255]**

Options: 1...255

With the parameter *Send delay factor*, you indicate which number between 1 and 255 the *Send delay base* should be multiplied by in order to set the total send delay period.

**5.2.11.2 Communication objects:  
Toggle value**

	0	Receive telegram	A:Toggle value input	1 Bit	Low
	1	Receive telegram	A:Toggle value setpoint 1	1 Byte	Low
	2	Receive telegram	A:Toggle value setpoint 2	1 Byte	Low
	3	Receive telegram	A:Toggle value save setpoints	1 Bit	Low
	4	Receive telegram	A:Toggle value Reset to preset	1 Bit	Low
	5	Send telegram	A:Toggle value output	1 Byte	Low
	6	Send telegram	A:Toggle value setpoint status	1 Bit	Low

Diagram 5.2.11.2

Diagram 5.2.11.2 displays the maximum number of communication objects of the *Toggle value* function.

The setpoint values (objects 1 and 2) are only displayed if the option 'rewritable over EIB' has been selected for the parameter *Setpoint value x is*.

To transfer a setpoint value, an ON telegram must be sent to the object *Save setpoints* (object 3).

If the setpoint values which have been entered in the ETS parameter window are reactivated, this can be achieved by an ON telegram to the object *Reset to preset* (object 4).

Even if the setpoint has been fixed, the communication objects (3 + 4) *Save setpoints* and *Reset to preset* appear. These objects are not required when there is a fixed assignment of the setpoints.

To experience which setpoint has last been sent to the output (object 5), the object *Setpoint status* (object 6) can be read. A 0 means that setpoint 1 was last sent while a 1 means that it was setpoint 2.

### 5.2.12 Counter function

If the *Counter* function is selected in the 'General' window, up to 2 further tabs appear in the ETS parameter window.

The counter is a telegram counter. Group address telegrams of sensors and actuators can thus be counted. The counter can register a telegram at a maximum of every 30 ms (corresponds to 33 Hz).

#### 5.2.12.1 Tab: 'X – Counter'

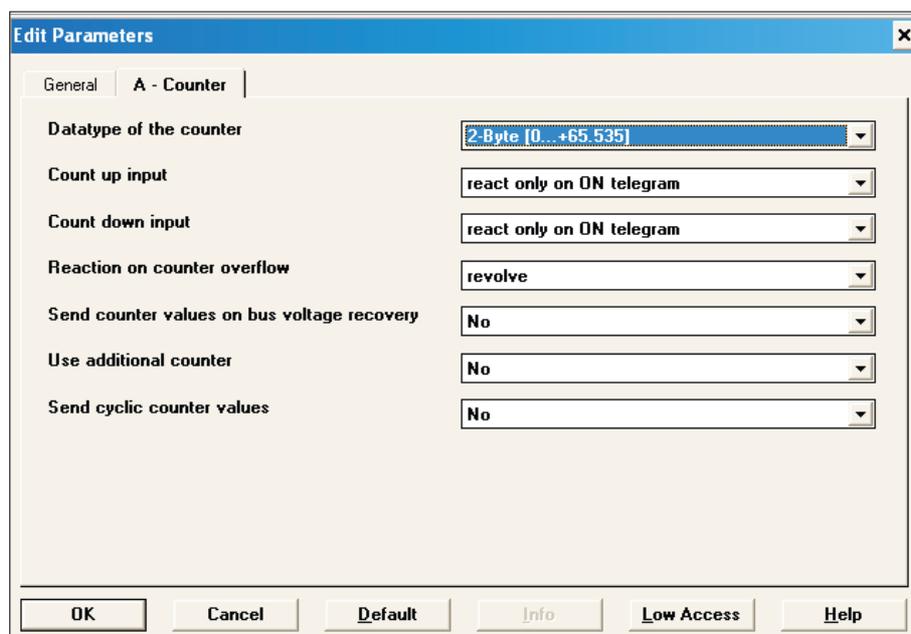


Diagram 5.2.12.1: 'A – Counter' in the default setting

#### Data type of the counter

Options:

- 1-Byte [0 ... + 255]
- 1-Byte [– 128 ... + 127]
- 2-Byte [0 ... + 65.535]**
- 2-Byte [– 32.768 ... + 32.767]
- 4-Byte [0 ... + 4.294.967.295]
- 4-Byte [– 2.147.483.648 ... + 2.147.483.647]

The parameter *Data type of the counter* defines the maximum size of the counter values.

#### Count up input

Options:

- react only on ON telegram**
- react only on OFF telegram
- react on any telegram

With the parameter *Count up input*, you define which telegram should trigger the up-counter.

### Count down input

Options:        **react only on ON telegram**  
                  react only on OFF telegram  
                  react on any telegram

With the parameter *Count down input*, you define which telegram should trigger the down-counter.

### Reaction on counter overflow

Options:        **revolve**  
                  stop  
                  reset to 0

When the largest possible counter value is exceeded or the value falls below the smallest possible count value, you can define the behaviour of the LM/S with *Reaction on counter overflow*. In the default setting 'revolve', the counter jumps back to the smallest possible or largest possible value (e.g. to -128 in the setting '1-Byte [- 128 ... + 127]' and when + 127 is exceeded).

### Send counter values on bus voltage recovery

Options:        **No**  
                  Yes

With this parameter, you can define whether the current counter value should be sent automatically after a bus voltage recovery or not.

### Use additional counter

Options:        No  
                  Yes

To activate an additional counter, you can set this parameter to 'Yes'. In this case, a further tab appears *X – Counter Add.Counter* appears.

### Send cyclic counter values

Options:        No  
                  Yes

If you would like the counter values (main and additional counter) to be sent cyclically, set the option 'Yes'. The further parameters *Base for cyclic sending* and *Factor for cyclic sending* appear.

### Base for cyclic sending

This parameter is only available if the option 'Yes' has been selected for *Send cyclic counter values*.

Options:        1 s  
                  10 s  
                  **1 min**  
                  10 min  
                  1 h

By selecting the parameter *Base for cyclic sending*, you preselect the time which should be used as a base for the cyclical sending.

**Factor for cyclic sending**

This parameter is only available if the option 'Yes' has been selected for *Send cyclic counter values*.

Options: 1 ... 255

By selecting the parameter *Factor for cyclic sending*, you indicate which number between 1 and 255 the *Base for cyclic sending* should be multiplied by in order to set the total period for cyclical sending.

### 5.2.12.2 Tab: 'X – Counter Add. Counter'

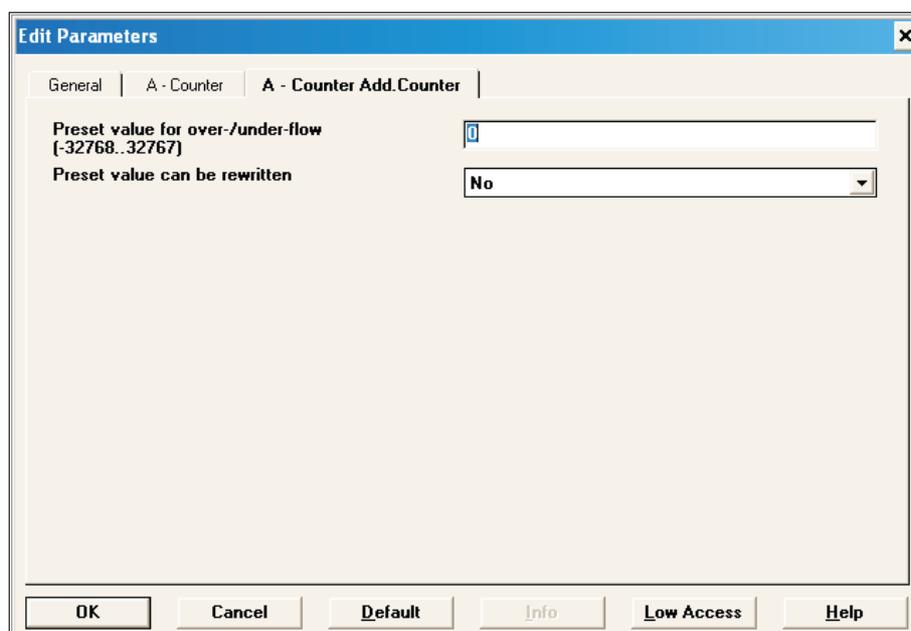


Diagram 5.2.12.2: 'A – Counter Add.Counter' in the default setting

**Preset value for over/underflow (– 32.768 ... 32.768)**

Options: – 32.768 ... + 32.767

The additional counter is a 2 byte counter in the value range –32.768 ... + 32.767. You can assign a maximum value to the additional counter via this parameter. If this counter content is reached, an ON telegram is sent to the communication object *Add. counter overflow* and the additional counter is reset to 0.

**Preset value can be overwritten**

Options: **No**  
Yes

If you would like to overwrite or set the preset values of the additional counter via the bus, select the option 'Yes'. You then receive a further communication object.

5.2.12.3 Communication objects:  
Counter

	0	Receive telegram	A:Counter up	1 Bit	Low
	1	Receive telegram	A:Counter down	1 Bit	Low
	2	Receive telegram	A:Counter disable	1 Bit	Low
	3	Receive telegram	A:Counter request values	1 Bit	Low
	4	Send telegram	A:Counter value	2 Byte	Low
	5	Send telegram	A:Counter add. counter value	2 Byte	Low
	6	Send telegram	A:Counter add. counter overflow	1 Bit	Low
	7	Receive telegram	A:Counter reset add. counter	1 Bit	Low
	8	Receive telegram	A:Counter add. counter preset	2 Byte	Low

Diagram 5.2.12.3

Diagram 5.2.12.3 displays the maximum number of communication objects of the *Counter* function.

Objects 0 and 1 as used as up-counter/down-counter inputs. With an ON telegram to the object *Counter disable* (2), the counter can be disabled. It then no longer reacts to telegrams at the up- and down-counter inputs.

If the current counter content (main and additional counter) should be sent from the LM/S, an ON telegram must previously be sent to the object *Counter request values* (3).

The data type of the object *Counter value* is dependent on the parameterisation. In this case, 4 byte was selected.

The additional counter value is fixed at 2 bytes and is issued via the object *Add. counter value* (5).

If the preset value of the additional counter is reached, the object *Add. counter overflow* (no. 6) sends an ON telegram.

If the additional counter should be reset to 0 (fixed or rewritable over EIB), an ON telegram must be sent to the object *Reset add. counter* (7).

Object 8, *Add. counter preset*, is only displayed if the parameter *Preset value* can be overwritten is set to 'Yes'. On receipt of a telegram at this object, the value is saved as a new preset value.

The counter is started with 0 after each download (application or partial). On receipt of a telegram at the counter input (object 1 or 2), the counter value is increased or decreased by 1 (dependent on the parameterisation). The counter value can only be queried by the bus in the default setting. If required, the counter value can also be sent cyclically. Resetting the counter to 0 can only be carried out by reloading the device (application or partial download) or by carrying out a device reset in ETS.

The preset value for the additional counter can be loaded via the bus. The additional counter can also be reset via the object *Reset add. counter*.

On bus voltage failure, the current counter value and the additional counter value are stored by the LM/S. The values are thus retained in the de-energised state.

 After each download (application or partial), the counter values are reset to 0.

### 5.2.13 Time delay function

If the *Time delay* function is selected as the 'General' window, two further tabs appear in the ETS parameter window, in which 2 time delays can be used.

The time delay can be used for 1 bit telegrams as an ON and/or OFF delay. For all other data types, it is used as a send delay for telegrams. This telegram delay causes the delay period to be started at the input when a telegram is received and the telegram only to be routed at the output once the period has elapsed. If a further telegram with a different value is received during the delay period, this new value is routed at the end of the delay period.

#### 5.2.13.1 Tab: 'X – Time delay y + z'

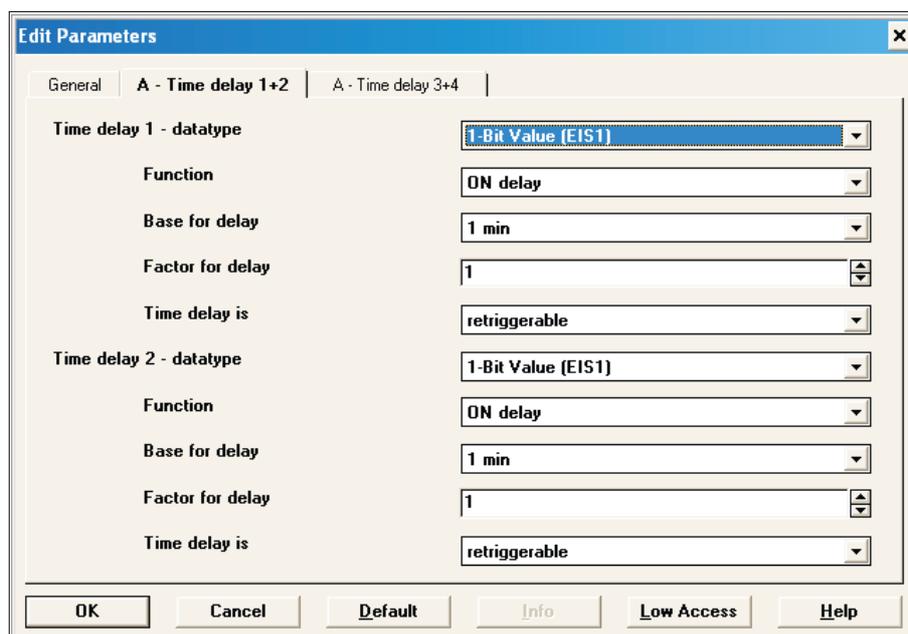


Diagram 5.2.13.1: 'A – Time delay 1 + 2' in the default setting

#### Time delay x – data type

Options: **1-Bit Value (EIS1)**  
 2-Bit Value  
 4-Bit Value  
 1-Byte Value (EIS6/EIS14)  
 2-Byte Value (EIS5/EIS10)  
 4-Byte Value (EIS9/EIS11)

The parameter *Time delay x – data type* defines which values should be used at the input and the output of a time delay.

#### Function

This parameter is only available if the option '1-Bit Value (EIS1)' has been selected as the *Time delay x – data type*. For all other data types, the time delay only serves to delay telegrams. This telegram delay causes the delay period to be started at the input when a telegram is received and the telegram only to be routed at the output once the period has elapsed. If a further telegram with a different value is received during the delay period, this new value is routed at the end of the delay period.

Options: **ON delay**  
 OFF delay  
 ON and OFF delay

The *Function* of the time delay defines whether the ON telegram, the OFF telegram or ON and OFF telegram should be issued at the output with a delay.

**Base for delay**

- Options: 100 ms  
 1 s  
 10 s  
**1 min**  
 10 min  
 1 h

The delay indicates how long the LM/S delays the telegram.

**Factor for delay [1 ... 255]**

- Options: 1 ... 255

With the parameter *Factor for delay*, you indicate which number between 1 and 255 the *Base for delay* should be multiplied by in order to set the total delay period.

**Time delay is**

- Options: **retriggerable**  
 not retriggerable

With this parameter, you can set how the LM/S reacts to a new telegram during the delay period. In the default setting, it is 'retriggerable' i.e. the delay period restarts when a new telegram is received during the delay period. In the telegram delay function, the value of the last telegram is routed once the delay period has elapsed.

If 'not retriggerable' is selected, the LM/S only reacts to a telegram again when the delay period has elapsed. In the telegram delay function, the delay period is started when a telegram is received and the last value that was received at the communication object is sent once the period has elapsed.

**5.2.13.2 Communication objects:  
 Time delay**

	0	Receive telegram	A:Time delay 1 input	1 Bit	Low
	1	Receive telegram	A:Time delay 1 disable	1 Bit	Low
	2	Send telegram	A:Time delay 1 output	1 Bit	Low
	3	Receive telegram	A:Time delay 2 input	1 Bit	Low
	4	Receive telegram	A:Time delay 2 disable	1 Bit	Low
	5	Send telegram	A:Time delay 2 output	1 Bit	Low
	6	Receive telegram	A:Time delay 3 input	1 Bit	Low
	7	Receive telegram	A:Time delay 3 disable	1 Bit	Low
	8	Send telegram	A:Time delay 3 output	1 Bit	Low
	9	Receive telegram	A:Time delay 4 input	1 Bit	Low
	10	Receive telegram	A:Time delay 4 disable	1 Bit	Low
	11	Send telegram	A:Time delay 4 output	1 Bit	Low

Diagram 5.2.13.2

Diagram 5.2.13.2 displays the communication objects of the *Time delay* function. When the disable object is active (=ON), the set function is not carried out. If the disable is only described when the function has already been started then the function is interrupted and no telegrams are sent at the output.

**6 Planning and application**

**6.1 Overview and general recommendations**

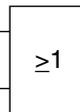
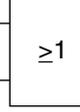
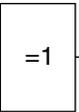
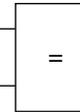
The Logic Module LM/S offers functions that are not possible with sensors and actuators alone. With the possibility of carrying out three different functions (e.g. logic, threshold values and scenes), all the additional functions in small EIB installations can generally be carried out with the LM/S.

7 Appendix

7.1 Overview of data types and EIS types

Data type	Value range	EIS type(s)
1 bit	Binary: 0 ... 1	EIS 1
2 bit	Binary: 00 ... 11 (priority)	EIS 8
1 byte	0 ... + 255	EIS 6, EIS 14
1 byte	- 128 ... + 127	EIS 14
1 byte	Percentage value	EIS 2, EIS 6
2 byte	0 ... + 65,535	EIS 10
2 byte	- 32.768 ... + 32.767	EIS 10
2 byte	EIB floating point value (temperature values)	EIS 5
4 byte	0 ... + 4.294.967.295	EIS 11
4 byte	- 2.147.483.648 ... + 2.147.483	EIS 11

7.2 Truth tables for the logic functions

<p><b>AND</b></p>  <table border="1" data-bbox="922 1070 1034 1182"> <thead> <tr><th>A</th><th>B</th><th>Q</th></tr> </thead> <tbody> <tr><td>0</td><td>0</td><td>0</td></tr> <tr><td>1</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>1</td><td>0</td></tr> <tr><td>1</td><td>1</td><td>1</td></tr> </tbody> </table>	A	B	Q	0	0	0	1	0	0	0	1	0	1	1	1	<p><b>OR</b></p>  <table border="1" data-bbox="1369 1070 1481 1182"> <thead> <tr><th>A</th><th>B</th><th>Q</th></tr> </thead> <tbody> <tr><td>0</td><td>0</td><td>0</td></tr> <tr><td>1</td><td>0</td><td>1</td></tr> <tr><td>0</td><td>1</td><td>1</td></tr> <tr><td>1</td><td>1</td><td>1</td></tr> </tbody> </table>	A	B	Q	0	0	0	1	0	1	0	1	1	1	1	1
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**Logic gates with truth tables**

The logic gates listed above can be set.

The gates and the tables describe the input and output states for only 2 inputs. When several inputs are used, the tables must be extended accordingly.

- 1) When there is an uneven number of inputs which are set to ON (ON telegram received), the output is also always ON (sends an ON telegram).
- 2) When there is an uneven number of inputs which are set to OFF (OFF telegram received), the output is always ON (sends an ON telegram).

7.3 Ordering information

Designation	Short code	Order number	bbn 40 16779 EAN	Price group	Unit weight [kg]	Unit pack [no.]
Logic Module	LM/S 1.1	GH Q631 0080 R0111	58121 9		0.1	1



The information in this leaflet is subject to change without further notice.

Pub. No. 2CDC 509 024 D0201

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