Panel Mounted
Fault Annunciator Series

BSM – Panel-mounted fault annunciator (2nd Generation)

19.10.2016

Operating manual

Table of content

1 Validity

The description covers BSM devices with the following options:

59	B	x	x	x	x	C	x	x	x	0	
		0 8									**Number of reporting inputs** 8 Reporting inputs
		1 6									16 Reporting inputs *
		2 4									24 Reporting inputs
		3 2									32 Reporting inputs
		4 0									40 Reporting inputs
		4 8									48 Reporting inputs
			1								**Operating voltage** 24 V AC/DC
			2								48 - 60 V AC/DC
			5								110 - 220 V AC/DC
				1							**Signal voltage** 24 V AC/DC
				3							48 - 60 V AC/DC
				4							110 V AC/DC
				H							125 V AC/DC
				5							220 V AC/DC
					D						**LED-Colour** 2-colour, adjustable (red, green)
						0					**Repeat relays** No internal repeat relays
						R					8 relay outputs (for 8 way fault annunciator)
						R					16 relay outputs (for 16 way fault annunciator)**
						R					24 relay outputs (for 24 way fault annunciator)
						R					40 relay outputs (for 40 way fault annunciator)
							0				**Redundant operating voltage** No additional power supply
							1				24 - 60 V AC/DC
							5				110 - 220 V AC/DC

59	B					C				0	**Article number**

* Also available in wide housing (96 x 192 mm)
** 16 way fault annunciator with integrated repeat relays only available in wide housing (96 x 192 mm)

Table 1.1: Matrix of BSM-C variants

59	B	x	x	x	x	P	x	x	x	0	
											Number of reporting inputs
		0	8								8 Reporting inputs
		1	6								16 Reporting inputs *
		2	4								24 Reporting inputs
		3	2								32 Reporting inputs
		4	0								40 Reporting inputs
		4	8								48 Reporting inputs
				1							**Operating voltage**
				2							24 V AC/DC
				5							48 - 60 V AC/DC
					1						110 - 220 V AC/DC
					3						**Signal voltage**
					4						24 V AC/DC
					H						48 - 60 V AC/DC
					5						110 V AC/DC
						D					125 V AC/DC
											220 V AC/DC
											LED-Colour
											2-colour, adjustable (red, green)
							0				**Repeat relays**
							R				No internal repeat relays
							R				8 relay outputs (for 8 way fault annunciator)
							R				16 relay outputs (for 16 way fault annunciator)**
							R				24 relay outputs (for 24 way fault annunciator)
							1				40 relay outputs (for 40 way fault annunciator)
							2				8 relay outputs (independent from no. of inputs)
											16 relay outputs (independent from no. of inputs)
								0			**Redundant operating voltage**
								1			No additional power supply
								5			24 - 60 V AC/DC
											110 - 220 V AC/DC

59 B [ ][ ][ ][ ] **P** [ ][ ][ ] **0** **Article number**

* Also available in wide housing (96 x 192 mm)
** 16 way fault annunciator with integrated repeat relays only available in wide housing (96 x 192 mm)

Table 1.2: Matrix of BSM-P variants

Version of the described parameterisation software: EES BSM Parameterisation V002j.

2 General notes

2.1 Additional instructions

This manual provides the safe and efficient use with the devices of the fault annunciating series BSM (in the following called “BSM”, “fault annunciator” or “device”). The manual is part of the device and must be stored always accessible for the personnel in direct proximity of the device.

The personnel are supposed to thoroughly read and fully understand this manual prior to starting any works. The major condition for secure handling is to obey to all security and usage procedures described in this manual.
Furthermore the local prevention advices and general security preventions in the installation site are obligatory.

The illustrations included in this manual serve for essential comprehension and are subject to modifications matching the application.

2.2 Usage

This manual is a prerequisite for secure mounting and safe operation of the product and must be read and understood before mounting.

2.3 Target group

This manual was written for qualified personnel which – based on their specific education and knowledge and experience as well as their knowledge of the relevant norms and regulations – are subject to deal with electrical sites and able to recognize and prevent possible hazards.

The qualified personnel is trained especially for the working environment and is familiar with the norms and regulations.

2.4 Symbol definition

Security advice

Security advices are indicated with symbols in this manual. The security advices are expressed through signal words that characterize the extent of the hazard.

DANGER!
This combination of symbol and signal word warns of a hazardous situation which can lead to death or severe injuries if not avoided.

WARNING!
This combination of symbol and signal word warns of a possibly hazardous situation which can lead to death or severe injuries if not avoided.

CAUTION!
This combination of symbol and signal word warns of a possibly hazardous situation which can lead to minor injuries if not avoided.

NOTE!
This combination of symbol and signal word warns of a possibly hazardous situation which can lead to material damages if not avoided.

ENVIRONMENTAL PROTECTION!
This combination of symbol and signal word warns of possible hazards for the environment.

Tipps and recoomendations

This symbol accentuates useful tips and recommendations for an efficient and failure-free operation.

Further markings

To accentuate operation instructions, results, listings, cross references and other elements, the following markings are used in this manual:

Marking	Description
	Step-by-step operation instructions
	Results of operation steps
	Cross reference to sections of this manual and to further applicable documents
	Listings without fixed sequence
[Button]	Control elements (e.g. buttons, switches), Indication elements (e.g. signal lamps)
„Display“	Display elements (e.g. push buttons, assignment of function buttons)

Important passage

This symbol accentuates especially important passages..

Cross reference

This symbol refers to figures and other passages in this document or to further reading.

2.5 Safety instructions

2.5.1 Appropriate use

The universal fault annunciator USM is intended for use according to the applications described in this manual only and may only be used according to the conditions as described in the section “Technical Data”. Every use that exceeds the appropriate use or unauthorized use is considered as incorrect use.

WARNING!
Hazard of incorrect use!
Incorrect use of the annunciator can lead to hazardous situations.

- Do never use the annunciator in EX-areas.
- Do never use the annunciator within the range of irradiation sensitive devices without considering the special precautions therefor.
- The annunciators may not be opened or improperly modified.

2.5.2 Storage of the manual

The manual must be stored nearby the annunciator and must be accessible for the personnel.

2.6 Customer service

For further technical information please contact our customer service:

Address	Elektra Elektronik GmbH & Co Störcontroller KG Hummelbühl 7-7/1 71522 Backnang Germany
Telephone	+ 49 (0) 7191/182-0
Telefax	+49 (0) 7191/182-200
E-Mail	info@ees-online.de
Internet	www.ees-online.de

Further we are looking forward to receiving feedback and experiences which result from the application and are useful for improvement of our products.

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3 Functional description

3.1 Basic set-up of the BSM

The annunciators are available in 2 versions.

- BSM-C: Basic version, configurable by DIP-switches
- BSM-P: Software-parameterisable version

The fault annunciators are available with 8, 16, 24, 32, 40 or 48 signal inputs. The alarms are aligned to groups of 8 inputs each on the device front. The closed front panel contains 4 push buttons, bi-colour LED displays (red / green) and slide-in pockets for the labelling strips. The buttons have the functions “horn acknowledement”, “alarm acknowledgement” and “lamp test” for the BSM-C and are parameterisable for the BSM-P.

Two function inputs are available and can be used according to the chosen reporting sequence (e.g. for external acknowledgement).
The annunciator features four change-over relays as integrated function relays. Alarm specific functions (e.g. collective report or external horn triggering) as well as signalization of any malfunction through a live-contact can be realized with the function relays.
All annunciators of the series BSM feature status retention upon power failure. This means that after restoration of the supply voltage, the alarm status as of the moment of power failure is retained.

To forward single alarms input- or output parallel to a relay contact, two different methods can be used:

1. Integration of additional relay cards (8 NO contacts each) as repeat relays. The assignment of inputs to repeat relays can be done individually for BSM-P annunciators. The integrated repeat relays are available as an option and have to be considered when ordering the device.
2. Connection of external relay modules through the CAN-Bus interface. For further details to the relay extension modules, please refer to the separate datasheet MSM-EM-DB-UK.

All BSM fault annunciators provide a hardware-watchdog and software-monitoring. The fault-free operation is indicated by an OK-LED and through a relay contact (live-contact).

Each fault annunciator features an internal horn. Additionally, an external horn can be triggered through a function relay.

The parameterisation of the BSM-P is done through the USB-parameterisation interface by means of a parameterisation software. By these means the reporting sequence, input processing, assignment to collective reports and horn triggering can be defined and protocol parameters, IP-address and information object addresses can be parameterized. A detailed descripition of the parameterization can be found in the section “Parameterisation”. Customised special reporting sequences can be realized ex factory upon request.

The fault annunciator BSM provides USB and CAN-Bus interfaces, which will be described regarding functionality and usage in the following sections.

Additional explanations to the integrated alarm sequeces can be found in the separate document „Alarm sequences of EES-Fault annunciators“ (SM-MA-ZI-UK).

3.2 Internal Relay cards (optional)

The optionally integrated relay cards (8 NO contacts each) are independent from the 4 function relays of the annunciator and can be assigned to the following functions:

1. In- or output parallel multiplication and forwarding of single alarms within the annunciator and without the requirement for connection of external relay modules MSM-RM.
2. Issue of collective reports and triggering of external horn

The 8 relays of one board have one common root. Triggering and functionality can be adapted individually by means of the parameterization software for the BSM-P, e.g. inversion of the signal. For BSM-C these functions are fixed assigned.

3.3 Dual power supply (optional)

Independent from the primary power supply, a second, redundant power supply can be integrated into the fault annunciator. Two different voltage variants are available:

- 24 – 60 V AC/DC
- 110 – 220 V AC/DC

The voltage level of the redundant power supply can be chosen independently from the voltage level of the primary power supply. Both primary and secundary power supply are integrated into the self-monitoring of the annunciator and any malfunction is indicated on the live-contact. Additionally, presence of the supply voltage is indicated for both power supplies by an LED on the rear of the device.

3.4 Cascading of several fault annunciators

With the cascading functionality one BSM or USM and up to 3 BSM (BSM-C or BSM-P) can be grouped to an annunciating system which is processed as a virtual compound annunciator with common signalling (reporting sequence, forming of collective reports and horn triggering).
The USM (universal fault annunciator) is comparable to a BSM-P, but additionally provides a communication interface IEC 60870-5-101/104 or IEC 61850. Through the communication interface of the USM, signals and alarms of the whole annunciating system can be addressed.

The communication within the annunciating system is done through the integrated CAN-Bus interface. The devices are connected to each other by means of a patch-cable. The first BSM or USM works as “master” and the connected BSM-C or BSM-P act as “slave”. Thus a system with up to 192 (4*48) signals can be realized. When creating an annunciating system, please note that the number of channels of the USM has to be bigger or equal to the number of channels of the connected BSM devices.
External MSM relay modules cannot be connected to cascaded annunciators.

The parameterization is done in the master fault annunciator (USM or BSM-P) by means of the web-server and is distributed automatically to the slave devices. Further information to the above mentioned USM can be found in the separate operting manual for USM (MSM-USM2G-BA-UK).

Fig. 3.1: General design of a cascaded fault annunciator system

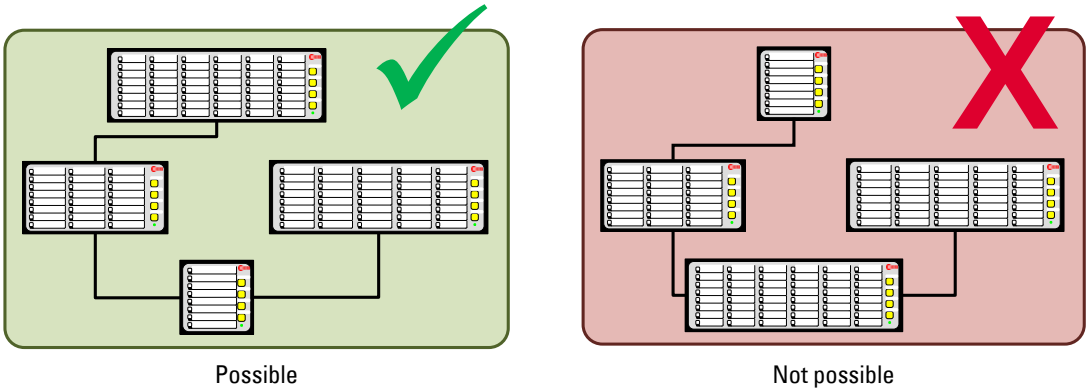


Fig. 3.2: Examples of cascaded annunciator systems

3.5 Labelling

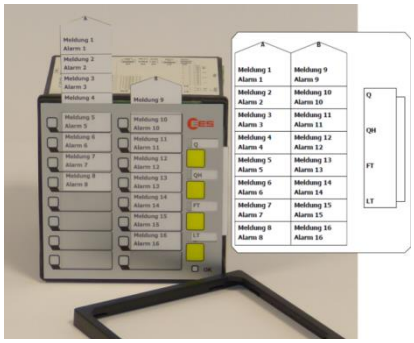


Fig. 3.3: Insertion of labelling strips after removing the front frame

Labelling of the annunciators is done by means of designation strips that can be inserted beneath the cover foil after removing the front frame.

The designation strips with signal names can be created and printed directly from the parameterisation software for the BSM-P. For manual generation of labelling strips for BSM-C or BSM-P patterns in Word-format are available.

3.6 Monitoring LEDs, buttons and connections

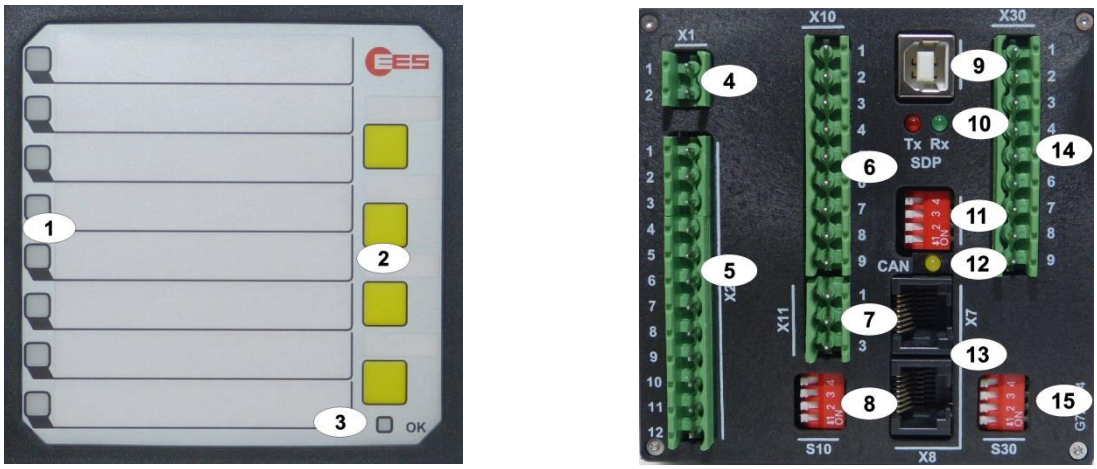


Fig. 3.4: Front- and rear view of the BSM08

[1] Alarm LEDs (function depending on reporting sequence)
[2] Buttons 1 … 4, (function depending on reporting sequence and parameterisation)
[3] Watchdog-LED „Self-monitoring“
- Steady light green - no error
- Off - no power supply or device defective
- Flashing red - error (→ section „Diagnosis“)
- Flashing green - initialisation of the annunciator

[4] Terminals power supply
[5] Terminals function relays
[6] Terminals signal inputs
[7] Terminals function inputs
[8] DIP-switch S10 (DIP-switch for alarm group functions)
[9] Service- and diagnosis interface USB-B*
[10] Watchdog-LEDs for service- and diagnosis interface*
red - Tx service- and diagnosis interface
green - Rx service- and diagnosis interface
[11] DIP-Switch S1 (cascading)
[12] Monitoring-LED CAN-Bus (yellow)
[13] 2 x CAN-Bus interface (RJ45)
[14] Terminals repeat relays**
[15] DIP-switches for the repeat relays – have no function in these annunciator variants**

* Only for BSM-P
** Only when optional integrated repeat relays are provided

In this section, the BSM-P with 8 alarm channels and integrated repeat relays is used to illustrate the general setup of a BSM. The number of signal inputs and the colours of the alarm LEDs can deviate depending on the configuration and size of the respective BSM.

3.7 Diagnosis

For monitoring and evaluation of the system functions diagnosis information is available by signalling of errors on the watchdog LEDs and relay contacts.

3.7.1 Watchdog-LED „Self-monitoring“ and Live-relay

The watchdog-LED „self-monitoring“ gives information about the current status of the annunciator device or system:

- Steady light green = no error
- Flashing green = initialisation of the annunciator
- Flashing red = error
- Off = no power supply

From the flashing sequence, an error code can be read which defines the error. A flashing sequence consists of:

- Number of long flashing pulses → 1st digit of the error code
- Number of short flashing pulses → 2nd digit of the error code
- Pause

Example: long, short, short, pause = error code 12

If multiple errors are at issue, the LED displays the error with the highest priority.

In addition to the watchdog LED “Self-monitoring” the live-relay signalises the operational state of the annunciator by means of a change-over contact.

Terminal block X2
Contact 11 / 10 closed - power failure or error (→ error codes)
Contact 11 / 12 closed - no error

3.7.2 Error codes

The hexadecimal error codes which are listed in the following table resemble the flashing sequence of the OK-LED of the BSM.

Example:

Error 15	*- Communication within cascaded annunciator system disturbed*
Flashing sequence of OK-LED	*- long, short, short, short, short, short, pause*

In the following table the error codes of the USM are enlisted.

Error code	Error	Remark
11	Internal error	If the error still is at issue after restart of the device, the device needs to be returned to EES for inspection.
12	Internal error	
13	Overflow alarm buffer	After a surge of alarms, interstages of alarms can be lost. The final stages of the alarms are valid.
14	Relay cards	If the error still is at issue after restart of the device, the device needs to be returned to EES for inspection.
15	Communication within cascaded annunciator system disturbed	This error can occur in cascaded systems. It will be issued when the connection between the master BSM and at least one of the slave BSM is disrupted. Please verify the configuration of the slave addresses and the connection cables.
17	Operating voltage 1	This error can occur in annunciators with dual power supply.
18	Operating voltage 2	
19	Configuration inconsistent	The downloaded configuration does not match the hardware of the device (e.g. BSM08 and BSM16).
33	Parameter file missing	Download manufacturer file. Please contact customer service.
34	Imported configuration is faulty	Download correct file to the device or restore default setting by means of the parameterisation software.

Table 3.1: Error codes of theBSM

3.8 Terminal assignments

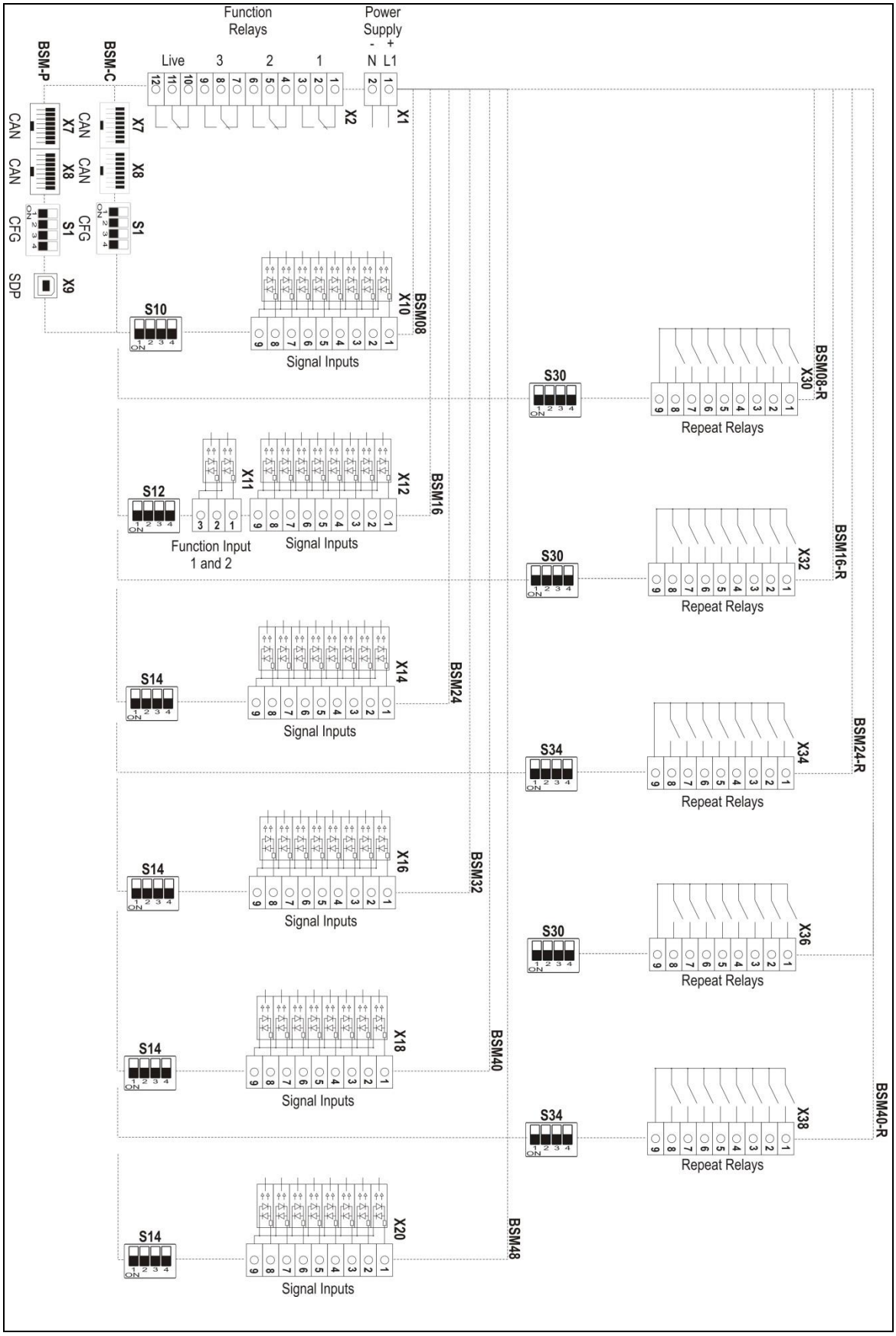


Fig. 3.5: Terminal assignment BSM

3.9 Technical data

Supply voltage U_{Sup}

Key	Rated voltage	Voltage range
1	24 V AC/DC	19…37 V DC or 14…26 V AC
2	48 V AC/DC or 60 V DC	37…73 V DC or 26…51 V AC
5	110 V AC/DC or 220 V AC/DC	100…370 V DC or 85…264 V AC

Table 3.2: Supply voltage keys – BSM

Signal voltage U_{Sig}

Key	Rated voltage [V AC/DC]	Threshold for alarm		Maximum permitted voltage [V AC/DC]	Input current per input @ rated voltage [mA]
		Inactive [V AC/DC]	Active [V AC/DC]		
1	24	11	15	50	2,3
3	48	17	25	75	2,1
	60	17	25	75	2,7
4	110	35	50	150	1,6
H	125	35	50	150	1,8
5	220	100	140	260	1,2

Table 3.3: Signal voltage keys – BSM

The voltage U_{Sig} is valid for signal inputs and function inputs.

If not otherwise specified the given information for alternating voltage are effective values and refer to a sinusoidal alternating voltage with a frequency of 50/60 Hz.

Power consumtion

Number of channels	Power consumption [W]	
	Without integrated repeat relays	With integrated repeat relays
8	< 4	< 6
16	< 5	< 9
24	< 5	< 13
32	< 6	< 11*
40	< 7	< 19
48	< 8	< 13*

Table 3.4: Power consumption – BSM

* The power consumtion of 32- and 48-way annunciators with integrated repeat relays refers to a maximum number of 2 relay cards (16 relays).

General data

Buffer time in the event of failure / short circuit	100 ms*
Response delay	
BSM-C	100 ms
BSM-P	adjustable (5 ms … 9 h)
Flashing fequency	
Single frequency flashing	2 Hz
Slow flashing	0,5 Hz
Load capacity of relay contacts	24 ... 250 V AC 2 A; 110 V DC 0,5 A; 220 V DC 0,3 A
Ethernet interface	100 Base-T / RJ45

* Storage of the last state of inputs and sequence in the event of power failure.

Mechanical data

Type BSM	Front frame H x W x D [mm]	Panel cut-out [mm]	Depth with front frame and terminals [mm]	Weight [kg]
08 08-…-R*	96 x 96 x 8	92 x 92	100	approx. 0,40
16	96 x 96 x 8	92 x 92	100	approx. 0,45
16-…-R** 24 24-…-R* 32	96 x 192 x 8	92 x 186	100	approx. 0,70
40 40-…-R* 48	96 x 287 x 8	92 x 282	100	approx. 1,00

Table 3.5: Dimensions – BSM

* BSM-…-R are variants with integrated repeat relays.

** A 16-way annunciator with integrated repeat relays can only be realised in the variant 16 wide (housing 96 x 192 mm).

Mounting	panel mounting
Required installation depth	120 mm
Minimum horizontal gap	
Between 2 devices	15 mm
Connection terminal	pluggable
Wire cross section rigid or flexible	
Without wire sleeves	0,2 ... 2,5 mm^2
With wire sleeves	0,25 ... 2,5 mm^2

Ambient environment

Operating ambient temperature	-20°C .... +60°C
Storage temperature	-20°C .... +70°C
Duty cycle	100 %
Protection class at the front	IP 54
Protection class at the rear	IP 20
Humidity	75% r.h. max. on average over the year; up to 93% r.h. during 56 days; condensation during operation not permitted [Test:40°C, 93% r.h. > 4 days]

Dielectric strength

Voltage dielectric strength	
CAN-Bus and USB	500 V / 50 Hz 1 min
Digital inputs	4 kV AC / 50 Hz 1 min
Relay contacts	4 kV AC / 50 Hz 1 min
Supply (110 / 230V AC/DC)	3,0 kV AC / 50 Hz 1 min
Supply (24 / 48 V AC/DC)	1,0 kV AC / 50 Hz 1 min
Relay contacts against each other	500 V / 50 Hz 1 min

Pulse withstand strength	
CAN-Bus and USB	500 V ; 1,2 / 50 µs; 0,5 J; nach IEC60255-5:2000
Digital inputs	2,5 kV ; 1,2 / 50 µs; 0,5 J; nach IEC60255-5:2000
Relay contacts	2,5 kV ; 1,2 / 50 µs; 0,5 J; nach IEC60255-5:2000
Supply	2,5 kV ; 1,2 / 50 µs; 0,5 J; nach IEC60255-5:2000
Relay contacts against each other	500 V ; 1,2 / 50 µs; 0,5 J; nach IEC60255-5:2000

Electromagnetic compatibility

Noise immunity acc. to	DIN EN 61000-4-2:2001-12
	DIN EN 61000-4-3:2008-06
	DIN EN 61000-4-4:2005-07
	DIN EN 61000-4-5:2007-06
	DIN EN 61000-4-6:2008-04
	DIN EN 61000-4-12:2007-08
Noise irradiation acc. to	DIN EN 61000-3-3:2006-06
	DIN EN 55011:2007-11

The devices are designed and manufactured for industrial applications according to EMC standard.

Subject to technical changes without prior notice

4 Mounting and installation

1. Unpack all modules of the delivery and check for possible transport damages. Report any transport damages to the responsible forwarding agent immediately. Please verify the integrity of the delivery according to the shipping documents.

2. Insert the annunciator into the prepared panel cut-out and fix it with the fasteners at the side of the device.

3. Connect the in- and outputs of the annunciator.

> The length of the wires of the in- and outputs should not exceed 3 m.

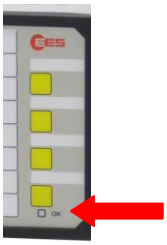
4. For a cascaded annunciator system, connect slaves according to steps 2 and 3 and connect the cascaded annunciators to each other by means of a patch cable through the CAN-Bus-interfaces (terminals X7 / X8 at the BSM and terminal X7 at the USM).

5. Connect the power supply and activate power supply.

> The length of the power supply wires should not exceed 10 m.

6. Parameterise the fault annunciator (refer to sections “Configuration” and “Parameterisation”).

7. Watchdog-LED “Self-monitoring” is in steady light – the fault annunciator is operational.
Watchdog-LED is flashing → section “Diagnosis”.



5 Configuration

For both BSM-C and BSM-P some main settings of the annunciator can be defined by configuration through DIP-switches. If further settings are required additional parameterisation by software is possible for the BSM-P (→ section “Parameterisation”).

To apply the DIP-switch settings to the annunciator, DIP-switch S1/4 has to be set to ON. If the additional options of the software parameterisation are to be used for the BSM-P, the DIP-switch S1/4 has to be set to OFF (default setting).

5.1 Cascading functionality (DIP-switch combination S1)

<table>
<tr><th>Switch</th><th>Function</th><th>Setting</th><th>Default setting</th></tr>
<tr><td>S1/4</td><td>Definition of the fcuntionality as per DIP-switch (configuration) or parameterisation (this definition is valid for all settings of the annunciator)</td><td>OFF – Parameterisation (software)
ON – Configuration (DIP-switch)</td><td>OFF - Parameterisation</td></tr>
<tr><td>S1/3 and S1/2</td><td>S1/1 = OFF (device is Master)
- Numer of connected slaves
or
S1/1 = ON (device is Slave)
- Slave-address</td><td><table><tr><th>S1/3</th><th>S1/2</th><th>Slave</th></tr><tr><td>OFF</td><td>OFF</td><td>none</td></tr><tr><td>OFF</td><td>ON</td><td>1</td></tr><tr><td>ON</td><td>OFF</td><td>2</td></tr><tr><td>ON</td><td>ON</td><td>3</td></tr></table></td><td>OFF, OFF
No connected slaves or no slave address</td></tr>
<tr><td>S1/1</td><td>Master or Slave</td><td>OFF - Master
ON - Slave</td><td>OFF - Master</td></tr>
</table>

Table 5.1: Assignment of DIP-switch combination S1

If the BSM is <u>not</u> part of a cascaded annunciator system, DIP-switches S1/1 – S1/3 are to be set to OFF (default setting).

5.2 Alarm group related DIP-switch combinations (S10 – S20)

The DIP-switches 1 and 2 of these DIP-switch combinations always affect the respective alarm group (8 channels) which is assigned to the respective terminals.

DIP-switch	Terminal
S10	X10
S12	X12
S14	X14
S16	X16
S18	X18
S20	X20

The functions of the switches 3 and 4 are set on one DIP-switch combination for the whole device.
For the BSM08 this is the combination S10 and for all other BSM it is the combination S12.

Table 5.2: Assignment of the DIP-switch combinations to the alarm channels (input terminals)

Switch	Function	Setting	Default setting
S./4	Alarm sequence when S./2 is set to OFF (fault signalling)	OFF - No-first-up* ON - First-up*	OFF – No-first-up
S./3	Horn triggering for subsequent alarms	OFF – Horn is retriggered ON - Horn is not retriggerable	OFF – Horn is retriggered
S./2	Processing of the alarm group (8 channels)	OFF – Fault signalling (Flashing, red) ON - Operation indication (Steady light, green)	OFF – Fault signalling
S./1	Normally open / normally closed principle of the group (8 channels)	OFF – Normally open ON - Normally closed	OFF – Normally open

Table 5.3: Assignment of the DIP-switch combinations S10 – S20

* The detailed descriptions of the alarm sequences are as follows:
- New-value reporting with 1-frequency flashing and single acknowledgement
and
- First-up reporting with 1-frequency flashing and single acknowledgement.
Detailed information on the alarm sequences can be found in the separate document for description of the alarm sequences SM-MA-FB-UK-001.

5.3 Configuration of the relay groups

The DIP-switches of the relay groups (S30 – S38) have no function in these annunciator variants.

The relay groups are set as follows:

- Relays are assigned 1:1 to the respective inputs.
- If only 1 or 2 relay groups (8 relays each) are integrated (e.g. BSM48), these are assigned to the first or the first two alarm groups (8 inputs each).
- The relays are triggered input parallel.
- The relays are not inverted.

For the BSM-P these settings can be changed in the parameterisation software.

5.4 Default settings

- LED-colour - red for fault signalling and green for operation indication
- Function input 1 - horn acknowledgement
- Function input 2 - acknowledgement
- Button 1 - horn acknowledgement
- Button 2 - acknowledgement
- Button 3 - lamp test
- Button 4 - not assigned
- Function relay 1 - collective report 1
- Function relay 2 - not assigned
- Function relay 3 - external horn
- Function relay 4 - live-contact
- Collective report - static / outputparallel
- Horn - retriggerable by subsequent alarm, manual acknowledgement
- Horn lock - none

6 Parameterisation

Alternatively to configuration by DIP-switches the BSM-P can be parameterised by software. To parameterise the device the service and diagnosis interface USM-B (terminal X9) of the BSM-P has to be connected to the PC.

System requirements

- Windows 7 or Windows 10
- Internet browser with **activated Javascript**
  We recommend to use Mozilla Firefox from version 40 or Internet Explorer from version 11.
  When using other internet browsers the functionality of the parameterisation software might be limited.
- Recommended monitor resolution from 1280 x 800

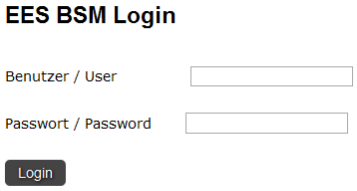
Installation

The installation is started with the execution of the file “EES-BSM-Parameterisation-Setup.exe”. During the installation of the software two Visual C++ packages are installed additionally, in case these are not yet available on your computer. This may require a restart of the PC.

Starting the programme

The parameterisation software “EES BSM Parameterisation V002j” can be started from the start menu or from the desktop icon.

The start screen will be opened automatically in the standard browser of your PC.



For the first login please use the following login data:

User: admin
Password: admin

Fig. 6.1 Login

The passwords can be changed in the dialogue „System“.

After correct login the first parameterisation page is opened within a few seconds.

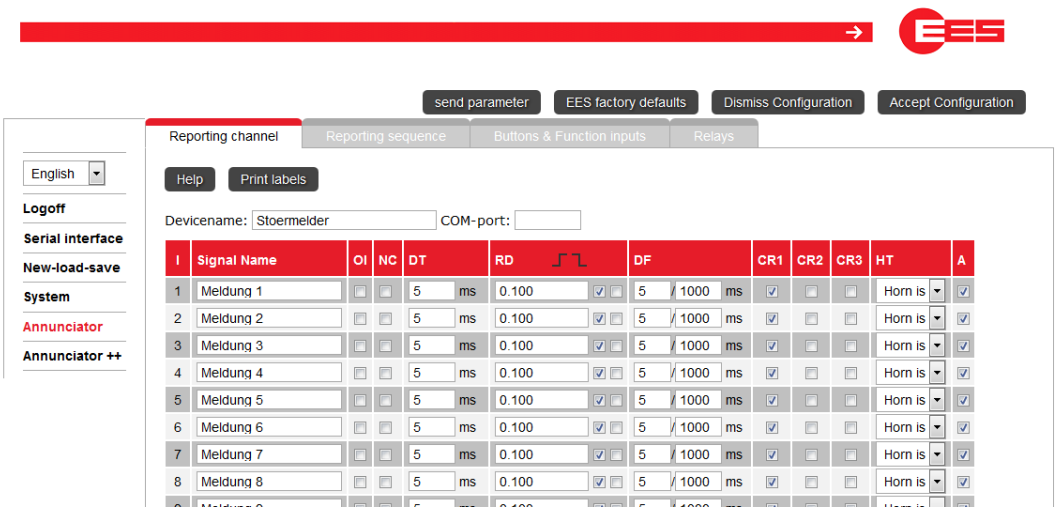


Fig. 6.2: Parameterisation page with main menu and sub-menu Annunciator

In the main window the menu “Annunciator” is already opened. The parameterisation could be started straight away. In this manual though, the single menus will be explained first in the order of their appearance in the menu bar.

On the left side of the screen the menu bar with the main menus is located. Some main menus are structured into sub-menus by different tabs.

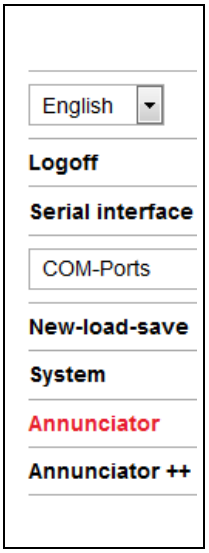


Fig. 6.3: Menu bar

- Language (German, English)
- Logoff
  Back to Login screen, any changes that have not been saved are dismissed.
- Serial interface
  Setting of the parameterisation interface of the PC. An interface will be displayed only if a BSM is connected to the PC.
- New-load-save
  - Store parameterisation file on the PC
  - Load stored parameterisation file from PC
  - Chose device variant of the BSM
- System
  Change passwords
- Annunciator (Annunciator functionality)
  - Reporting channels
  - Reporting sequence
  - Buttons & Function inputs
  - Function relays
  - Repeat relays
- Annunciator ++
  Setting up of cascaded annunciator systems by adding up to 3 additional annunciators (slave annunciators)

Some parameterisation pages are structured by different tabs and contain additional buttons. The function of these elements is described in the explanation of the respective pages.

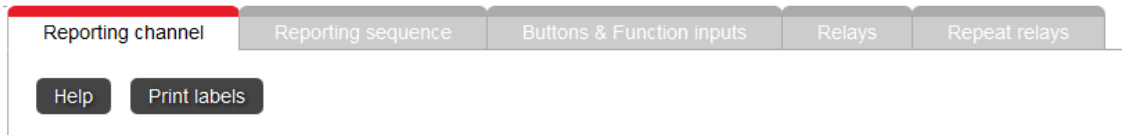


Fig. 6.4: Tabs and buttons on the page "Annunciator"

When switching the menus or tabs, changes will be stored but not taken over into the current parameterisation or sent to the annunciator. For this the functions „Accept configuration" or „send parameter" have to be activated by click on the respective buttons.

Upon logoff without accepting the configuration all new entered parameters of the session will be dismissed.

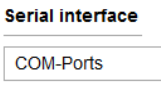
6.1 Choose language

In the main menu "Language" the parameterisation interface can be changed between German and English.

6.2 Logoff

This menu reverts to the login screen. Any changes that have not been stored (button "Accept configuration") will be dismissed.

6.3 Setting the parameterisation interface



In the menu „Serial interface" the parameterisation interface of the PC can be chosen. A drop-down menu will be available as soon as a BSM is connected.

When connecting a BSM to the PC fort he first time, the driver will automatically be loaded from Windows. If no interface can be chosen here, a restart oft he PC may be required. If still no interface is available, the driver has not been loaded / installed correctly. Please contact our customer service in this case. We will then provide the driver as a separate file.

6.4 Load and store parameter files, change variant of the Master annunciator

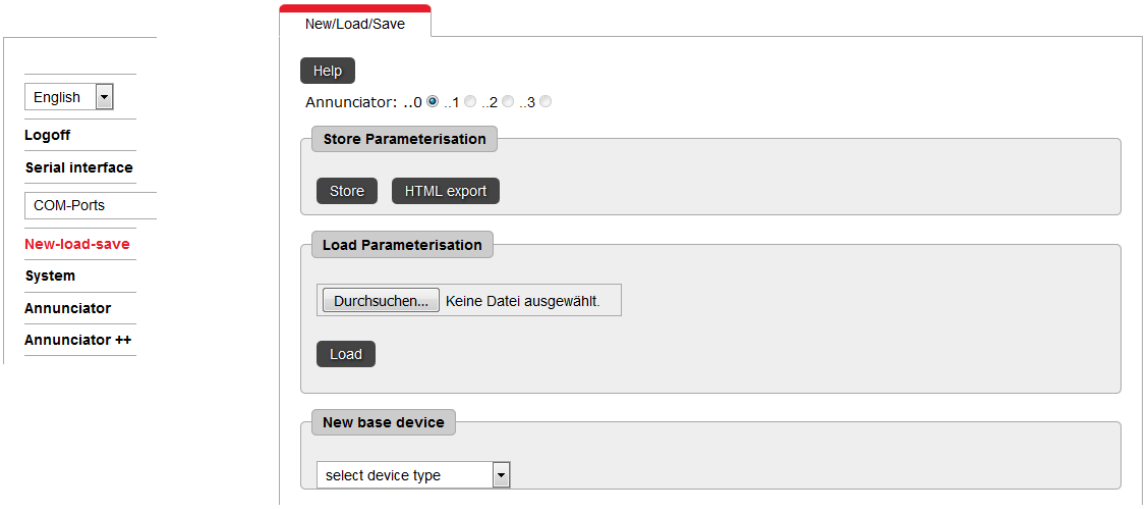


Fig. 6.5: Menu New-load-save

The following functions can be carried out on this page:

Store parameterisation

With this function the configuration of the annunciator can be stored on the PC as ucf-file and loaded as parameterisation file later. The file will be stored in the default download folder of the internet browser. Additionally the configuration can be exported in html-format for documentation purposes. If a cascaded annunciator system has been defined, the parameter files of the up to 3 slave devices can be exported as well. In this case the respective annunciator has to be chosen by the checkbox.

Chosing a slave annunciator is possible only when the respective annunciators have been added in the parameterisation of the annunciator functionality.

Load parameterisation

With this function a parameter file (UCF-file) can be imported and used. If a cascaded annunciator system has been defined, the parameter files for the up to 3 slave devices can be imported as well. In this case the respective annunciator has to be chosen by the checkbox. Chosing a slave annunciator is possible only when the respective annunciators have been added in the parameterisation of the annunciator functionality.

Set new base device

When starting the parameterisation software for the first time, the master annunciator is a 16-way annunciator with integrated repeat relays. With this function another BSM variant can be defined.

6.5 Change passwords

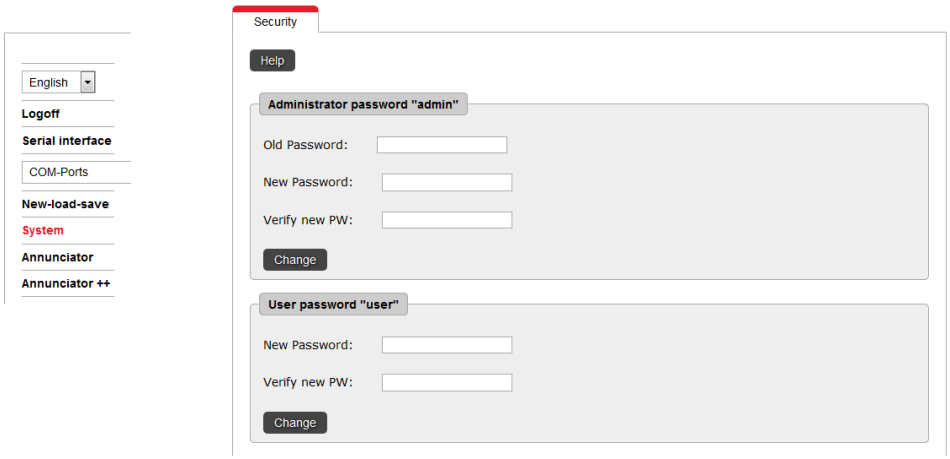


Fig. 6.6: Menu System

The passwords for the two users admin (with authentication) and user can be changed in the menu „System“.

admin - administrator (rights for reading and writing)
user - user with limited rights (rights for reading only)

The password may consist of ASCII characters and is limited to a maximum length of 40 characters.

6.6 Definition of annunciator functions

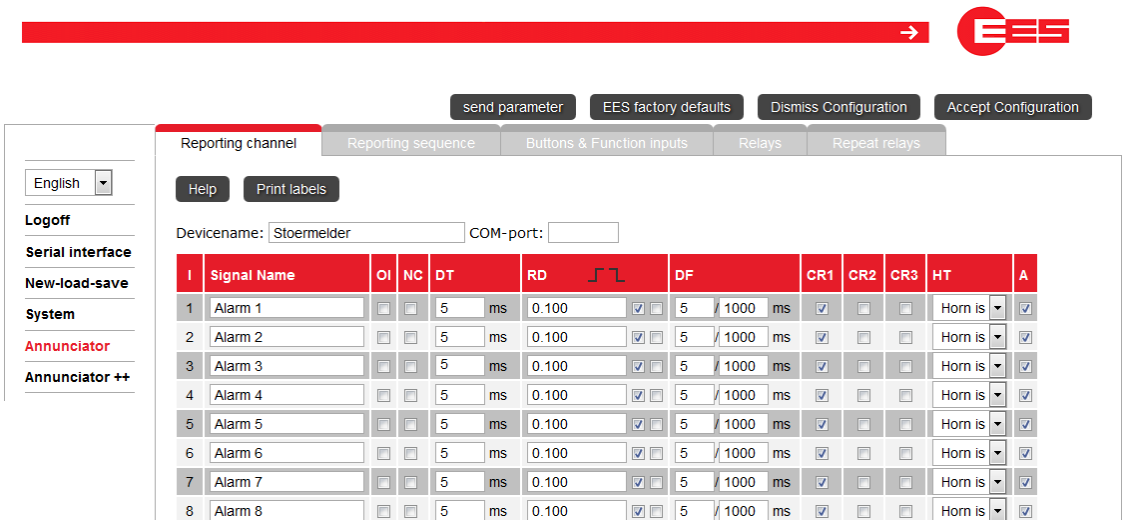


Fig. 6.7: Menu Annunciator

In the menu “Annunciator” the annunciating functionality of the device can be parameterised. It comprises the sub-menus:

- Reporting channels
- Reporting sequence
- Buttons & Function inputs
- Relays
- Repeat relays

Underneath the EES logo four buttons realise the following functions:

send parameter	Transmission of the parameterisation to a connected device. The parameters have to be stored on the PC with „Accept configuration“ first!
EES factory defaults	Resets all parameters to the default settings.
Dismiss Configuration	Dismisses all changes done to the parameterisation since last „Accept configuration“.
Accept Configuration	Confirms the changes done to the parameterisation and stores them locally. The parameters are available after closing and restart of the parameterisation software, but will not be transmitted to the connected device.

6.6.1 Reporting channels

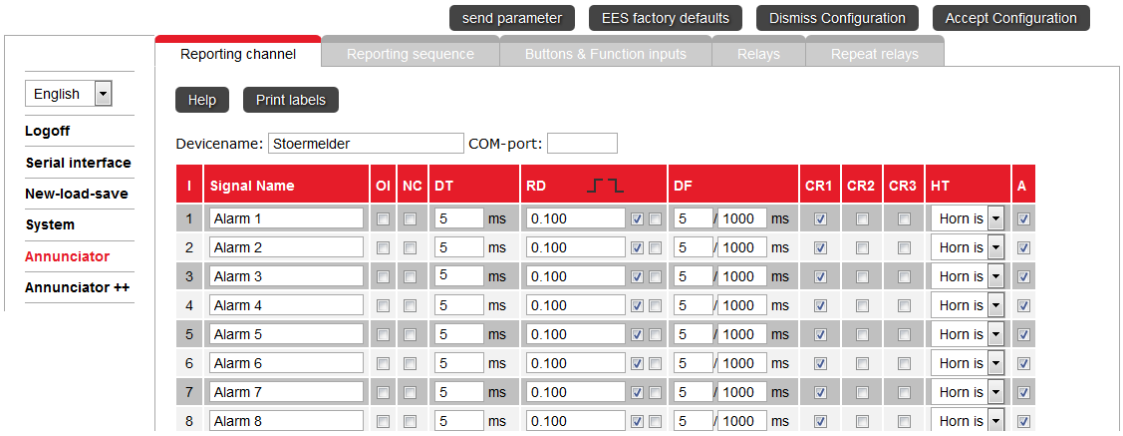


Fig. 6.8: Sub-menu Reporting channels

Devicename
A device designation with a maximum length of 40 ASCII characters can be entered here. This designation serves for identification of the device, is transmitted to the BSM when parameterised and stored there.

COM-Port:
This field shows the parameterisation port that has been chosen from the menu “Serial interface”.

Print labels
With click on the button “Print labels” a new window with the labelling strips will be opened. Strips with 8 signal channels each and one strip for the button labelling are displayed. The signal texts resemble the labelling of the channels, the button texts follow the declaration on the page “buttons & function inputs”. If a text is too long, it will be displayed in red characters and should be changed – otherwise only the visible part of the text will be printed. By click on a text within the labelling strip a new window for editing of the text will be opened. Please choose DIN A4 landscape format as paper settings for your printer.

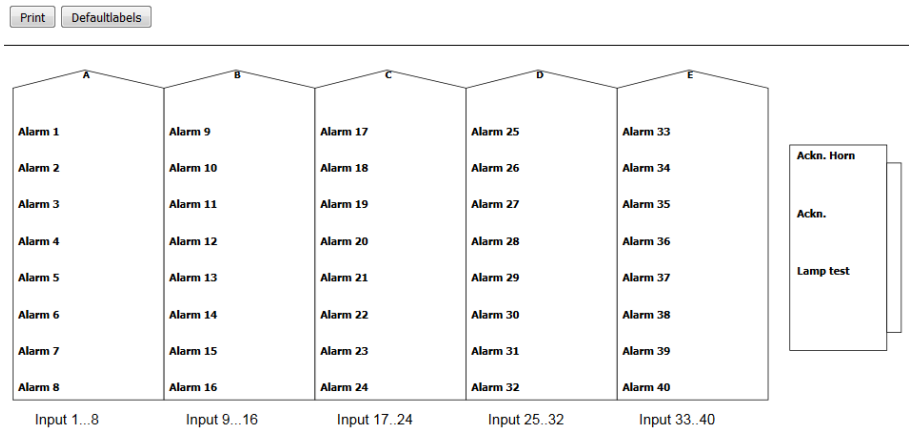


Fig. 6.9: Printing version of a labelling strip

In the table the following parameters can be defined for each signal channel.

Field	Explanation
I	**Channelnumber** (fixed assigned)
Signal name	**Designation of the respective channel** This designation will be used when printing the labelling strips. A 2-line labelling can be realised by separating the second line by "\" (backslash) from the first line (e.g. "Bucholtz\Alarm").
OI	**Operation indication** If this checkbox is ticked, the signal will be treated as operation indication. If this box is unchecked (default setting), the signal will be processed according to the chosen reporting sequence (→ page reporting sequence). By defining the signal to be operation indication or fault annunciation, the LED-colour will automatically be set according to the settings on the page "LED-colour". Default settings: operation indication = green, fault annunciation = red.
NC	**Normally closed principle of the inputs** (when checkbox is ticked) Normally open principle: application of a voltage at the input triggers an alarm. Normally closed principle: voltage drop at the input triggers an alarm. Default setting: Checkbox not ticked – normally open principle.
DT	**Debouncing time** The debouncing time defines the timespan for which a signal must continuously be applied before an alarm is issued. This prevents multiple alarms in the case of a bouncing switch. Time 0 ms … 1000 ms, settable in steps of 1 ms.
RD _|‾ ‾|_	**Response delay** The response delay delays a debounced and defluttered alarm before it is displayed, forwarded or deleted. This time span is considerably longer than the debouncing time. The response delay can be set from 0…32400s (9h) in two different patterns (values < 30s in steps of 1 ms, values > 30s in steps of 1 s). The value can be entered in three formats: 1. Single number e.g. 100 will be interpreted in seconds → 100 s 2. .xxx e.g. .100 will be interpreted in milliseconds → 100 ms 3. mmm:ss.xxx will be interpreted in minutes, seconds and milliseconds e.g. 111:22.0 → 111 minutes and 22 seconds The checkboxes _|‾ and ‾|_ for rising and falling edge define for which signal edge the alarm delay is active. _|‾ checked: delay is active for coming alarm ‾|_ checked: delay is active for receding alarm

Table 6.1a: Parameters of reporting channels

Field	Explanation
DF	The **defluttering** prevents alarms from being triggered and reset permanently e.g. by a loose contact. The defluttering acts after the response delay (debouncing). If an input changes more often than the defined number of edges within the fluttering time, the defluttering comes into effect and the alarm channel is marked as faulty. → **This information is only relevant for IEC communication and does not affect the local display of the annunciator!** Number of edges: 0 … 255 Fluttering time: 0 ms … 65535 ms, ~1 min., in steps of 1 ms Default settings: 5/100
CR1, CR2, CR3	**Assignment to collective reports** The alarm triggers the collective report which is checked here. Multiple allocations are possible. All alarms that are assigned to one collective report from a group. This assignment takes effect for acknowledgement and reset.
HT	**Horn triggering** None: Alarm does not trigger horn With horn lock: Horn acknowledgement only possible after lamp acknowledge No horn lock: Horn acknowledgement always possible
A	**Activation of the alarm channel** If this checkbox is unticked, the channel will not be processed. The alarm will be ignored within the complete system. Default setting: channel activated

Table 6.1b: Parameters of reporting channels

The following drawing illustrates the mode of operation of the two delay times and the defluttering. The options for triggering of the optionally integrated repeat relays is displayed as well (→ section “repeat relays”).

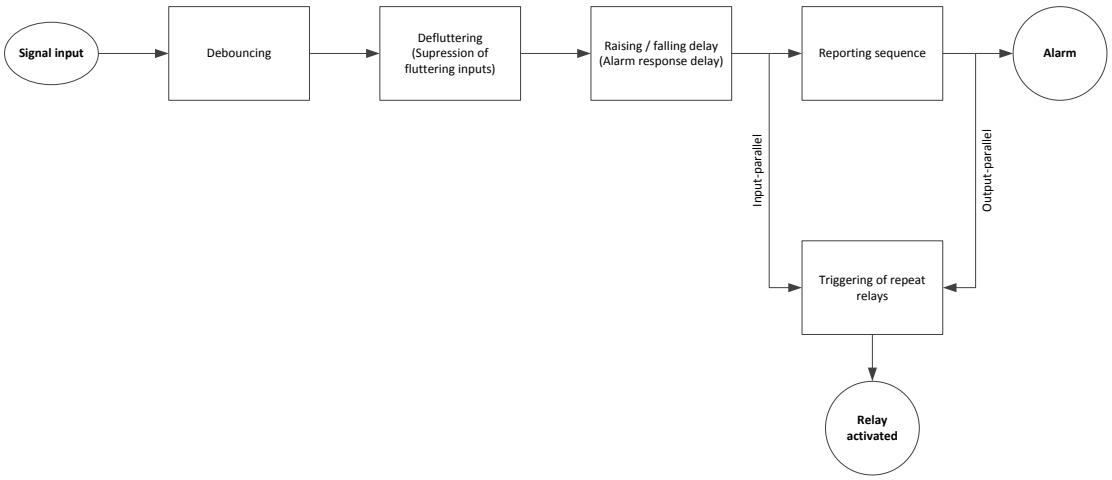


Fig. 6.10 Schematic illustration of the alarm processing in the BSM

To use the settings in one line for one or all other lines, line contects can be copied to the desired line(s). By right-click on the marked line a context menu with the following options opens:
Copy
Paste
Paste to all
The latter option fills all lines with the respective contents.

For device and channel designation, all characters from A…Z and 0…9 are allowed. The special characters „ { } | $ & # ; “ are not allowed. For channel designations, „\“ (backslash) is used as separation mark to start a new line.

6.6.2 Reporting sequence

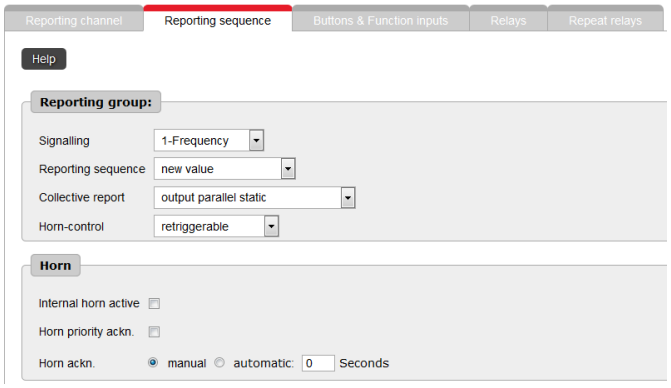


Fig. 6.11: Sub-menu Reporting sequence

In this sub-menu the reporting sequence and the horn triggering can be parameterised. To ensure a flexible adaption of the sequence to the requirements, the reporting sequence is composed from different components, which are explained in the following.

Reporting sequence

Title	Options	Note
Signalling	1-Frequency	1-frequency flashing
	2-Frequency	2-frequency flashing
	Status indication	Self-acknowledging alarm: alarm is displayed as acknowledged alarm and recedes, when the corresponding input drops.
Reporting sequence	New value	New value reporting (no-first-up)
	First up	First-up reporting
	Steady-steady-light	Can only be chosen for 2-frequency flashing
Collective report	Input parallel static	The collective report is set with the first incoming alarm and resets with the last receding alarm.
	Input parallel static-dynamic	The collective report is set with the first incoming alarm. For each subsequent alarm, the collective report is reset for approx. 0.8 s and then set again. Once all alarms have receded the collective report is reset permanently.
	Output parallel static	The collective report is set with the first incoming alarm. Once all alarms have receded and been acknowledged the collective report is reset.
	Output parallel static-dynamic	The collective report is set with the first incoming alarm. For each subsequent alarm, the collective report is reset for approx. 0.8 s and then set again. Once all alarms have receded and been acknowledged the collective report is reset permanently.
	dynamic	The collective report is activated for approx. 0.8 s with each incoming alarm.
	Input parallel static acknowledgeable	The collective report is set with the first incoming alarm and resets with the last receding alarm or when acknowledged.
	Output parallel static acknowledgeable	The collective report is set with the first incoming alarm and reset independently from the state of the alarms by acknowledgement.
Horn control	retriggerable	Horn is triggered by subsequent alarm, even if there are already alarms at issue.
	not retriggerable	Horn is triggered by subsequent alarms only if no alarms are at issue.

Table 6.2: Options reporting group

Additional explanations to the integrated alarm sequences can be found in the separate document „Alarm sequences of EES-Fault annunciators“ (SM-MA-ZI-UK).

Horn

Title	Options	Note
Internal horn active	Active	Internal and external horn will be triggered in parallel.
	Inactive	Internal horn is deactivated, relay contact for triggering of external horn stays active.
Horn priority acknowledgement	Inactive	Horn can always be acknowledged.
	Active	Horn can only be acknowledged once the alarm has been acknowledged.
Horn acknowledge	Manual (continuous tone)	Horn is acknowledged manually by button or function input.
	Automatic (pulse tone)	Horn is acknowledged automatically according to the set time.

Table 6.3: Options horn

Please note that the parameters „horn priority acknowledgement“ and „Horn triggering“ (HT, page „Reporting channel“) are dependent from each other. If horn priority acknowledgement is activated, the alarm can generally only be acknowledged after the horn has been acknowledged.

6.6.3 Buttons and Function inputs

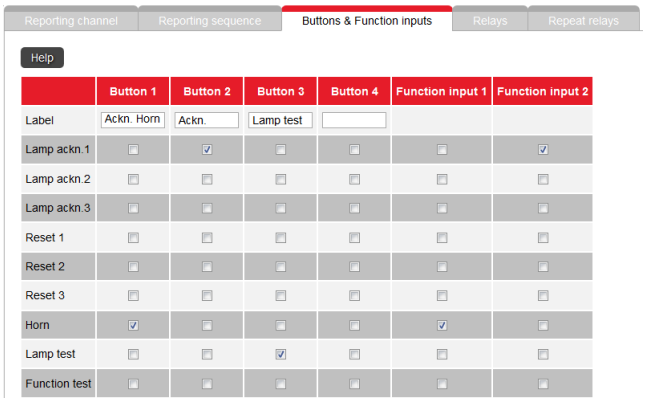


Fig. 6.12: Sub-menu assignment of buttons and function inputs

On this page, the specified functions can be assigned to the push buttons 1…4 and the function inputs 1 and 2. Multiple allocations are possible.

The designations of the buttons in the line „Label“ will automatically be adopted in the labelling strips and can be printed from the page „reporting channels“.

Function	Note
Lamp acknowledgement 1, 2, 3	Optical acknowledgement: Acknowledgement of the alarms in the collective report groups 1, 2 or 3
Reset 1, 2, 3	Reset of the alarms in the collective report groups 1, 2 or 3
Horn	Acknowledgement audible alarm
Lamp test	Lamp test
Function test	Simulation of alarms at all inputs

Table 6.4: Assignment of buttons and function inputs

The assignment is done in a matrix – the lines are representing the functions and the columns are representing the buttons and function inputs. Implemented assignments are displayed by a tick in the respective checkbox.

6.6.4 Relays (function relays)

On this page the assignment of the 4 function relays to different annunciation functions, buttons or function inputs can be defined.

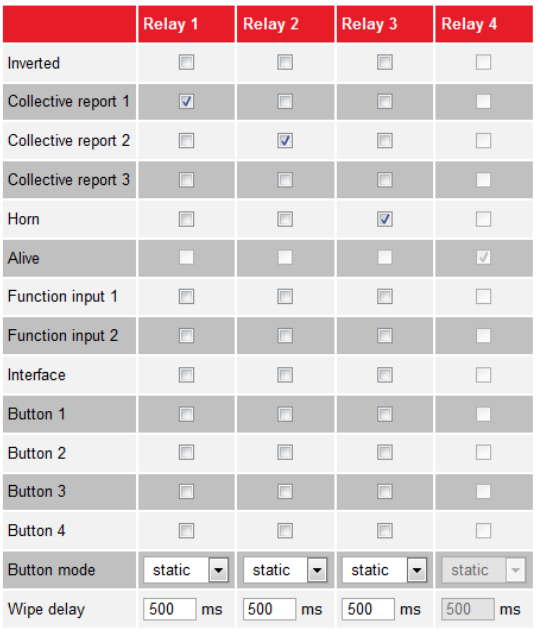


Fig. 6.13: Options Relays

The assignment is done in a matrix – the lines are representing the triggering events (e.g. pushing a button) and the columns are representing the relays. Implemented assignments are displayed by a tick in the respective checkbox.

Function	Note
Inverted	When activated the switching function is negated
Collective report 1, 2, 3	Activated by collective report 1,2 or 3
Horn	Relay contact for connection and triggering of an external horn
Alive	Alive-contact of the internal self-monitoring (fixed assigned to relay 4)
Function input 1, 2	Relay follows function input
Button 1 … 4	Relay follows button
Button mode	Function of the relay when triggered from button or IEC interface Static – relay is activated as long as the button is pushed Toggle – flip-flop function, relay converts with each excitation Wipe – relay is activated with each excitation and drops after the defined wipe duration (10…10000ms)

Table 6.5: Function assignment of the relays

Multiple allocations, e.g. aggregation of collective reports, are possible. For each relay the switching function can be negated – in this case the relay drops e.g. when a collective report is activated.

6.6.5 Repeat relays

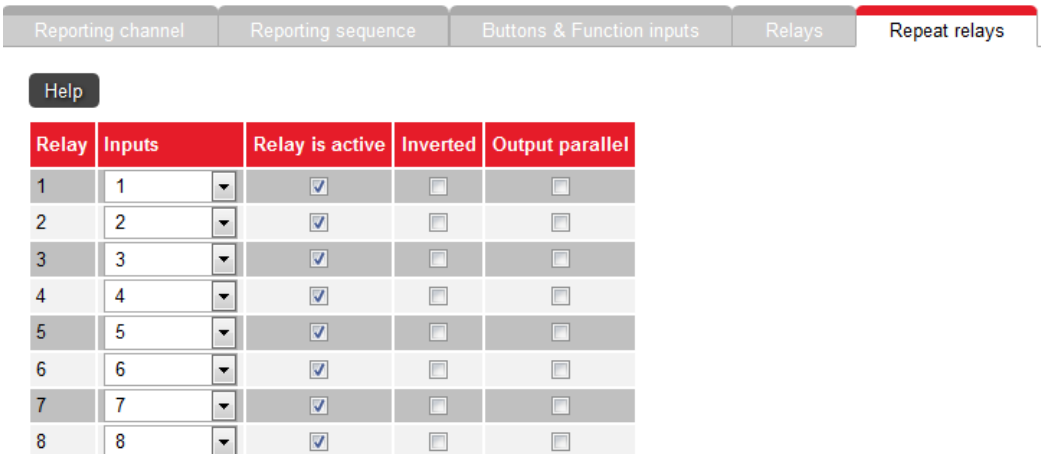


Fig. 6.14: Options Repeat relays

The optionally integrated repeat relay cards (8 NO contacts each) are independent from the 4 function relays described in the previous section.
Only the relays as available in the hardware to be parameterised will be displayed.
For each relay the following definitions can be made:

Inputs
Here the trigger for the relay can be defined. The following options are available:

- Function collective report 1,2 or 3
- Function horn triggering
- Available galvanic signal inputs

Relay is active
By unchecking the tickbox the relay is deactivated.

Inverted
When this checkbox is ticked, the respective function is negated. In this case e.g. the relay drops when a collective report is at issue and is energized when no collective report is at issue.

Output parallel
If the relay is triggered from a signal input, it can be defined if the relay directly follows the input (input parallel) or if it is activated until the corresponding alarm is acknowledged (stored alarm = output parallel).
Tickbox checked – Relay follows the stored alarm (= output parallel).

6.7 Cascaded annunciator systems

From a BSM (Master) and up to 3 Slaves (BSM-C or BSM-P) a cascaded annunciator system can be formed which disposes of one common alarm processing (reporting sequence, forming of collective reports and horn triggering). Instead of the BSM-Master, also a USM can be the master device in a cascaded annunciator system. In this case, the parameterisation is done according to the instructions in the operation manual for the USM.

The communication between the master and slave devices is realized through the integrated CAN-Bus interface. One BSM acts as “master” and the connected BSM-C or BSM-P act as “slave”. Thus systems with up to 192 signal inputs (4*48) can be realized.
When creating a cascaded annunciating system, please note that the slave devices have to be smaller than or equal to the master device. MSM-relay-modules cannot be connected to cascaded annunciators.

Please note the required DIP-switch settings according to the section cascading (DIP-switch combination S1).

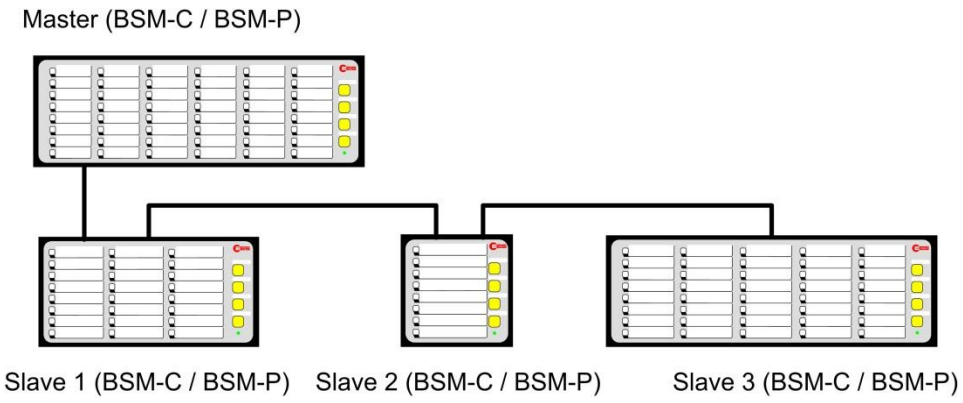


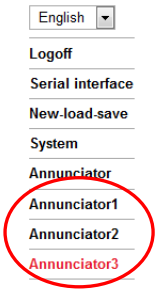
Fig. 6.15: Example of a cascaded annunciator system

After Click on “Annuniator ++” in the menu bar a drop down list opens from which a new slave device can be chosen. After choosing the respective device, a new menu “Annunciator 1, 2, 3” is added and opened. The device can now be parameterised according to the settings for the master device (→ section “Definition of annunciator functions”). The tab “Reporting sequence” is missing since the sequence is identical with the master device.
With the additional button

Delete device

the slave annunciator can be deleted from the configuration.

After accepting the configuration of the slave device, the parameters of the slave annunciator are stored locally and can be transmitted to the master annunciator and furthermore distributed to the respective slave with “send parameter”. Therefore the annunciators have to be connected through the CAN-Bus interface.



Independent from the parameterised devicename, the slave annunciator will be displayed under the name „Annunciator (1…3)“ in the menu bar and can be parameterised according to the requirements.

By this means, up to three slave annunciators can be defined and parameterised.

Fig. 6.16: Display of the slave annunciators

Contact

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