Universal fault annunciator for panel mounting

USM – Universal fault annunciator for panel mounting (2nd Generation)

19.10.2016

Operating manual

Table of content

1 Validity

The description covers the USM devices with the following options:

59	U	x	x	x	x	W	x	x	x	x	
		A B C D E F									**Number of reporting inputs** 8 Reporting inputs 16 Reporting inputs 24 Reporting inputs 32 Reporting inputs 40 Reporting inputs 48 Reporting inputs
			1 2 5								**Operating voltage** 24 V AC/DC 48 - 60 V AC/DC 110 - 220 V AC/DC
				1 3 4 H 5							**Signal voltage** 24 V AC/DC 48 - 60 V AC/DC 110 V AC/DC 125 V AC/DC 220 V AC/DC
					E						**Device type** Acquisition module
						W					**Protocol interface 1 (Processlayer)** IEC 60870-5-101/104
							0 W L				**Protocol interface 2 (Superior level)** none IEC 60870-5-101/104 Network interface over optical fibre (Type SC)
								D			**LED-Colour** 2-colour, adjustable (red, green)
									0 R R R R 1 2		**Repeat relays** no internal repeat relays 8 Relay outputs (for 8 way fault annunciator) 16 Relay outputs (for 16 way fault annunciator) 24 Relay outputs (for 24 way fault annunciator) 40 Relay outputs (for 40 way fault annunciator) 8 Relay outputs (independent from no. of inputs) 16 Relay outputs (independent from no. of inputs)
										0 1 5	**Redundant operating voltage** no additional power supply 24 - 60 V AC/DC 110 - 220 V AC/DC

Table 1: Matrix of USM devices

2 General notes

2.1 Additional instructions

This manual provides the safe and efficient use with the devices of the universal fault annunciating system (in the following called „USM, 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 recommendations

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 USM

The series of universal fault annunciators USM is designed for systems networked by Ethernet.

The USM serves for acquisition and indication of alarms that are provided on the galvanic inputs or through the Ethernet interface from a communication partner (e.g. SCADA system). The alarms are processed and displayed according to the parameterized reporting sequence.

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

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.

Two function inputs are available and can be used according to the chosen reporting sequence (e.g. for external acknowledgement).

The functions that are assigned to the push buttons, function inputs and function relays can be parameterized individually.

All USM 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).

The parameterisation of the annunciator is done through the integrated web-server with a web-browser and by uploading of parameterization files. 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 USM provides different interfaces (USB, CAN, SDP, COM and LAN), 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 Relays 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 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
3. Triggering of the relay from the IEC interface

The 8 relays of one board have one common root. Triggering and functionality can be adapted individually by means of the parameterization interface on the web-server, e.g. inversion of the signal or wipe duration for pulse commands.

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. Failure of one of the power supplies is communicated on the protocol interface.

3.4 Cascading of several fault annunciators

With the cascading functionality one USM and up to three 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). 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 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 by means of the web-server and is distributed automatically to the slave devices.
> Information to the BSM annunciators can be found in the separate BSM manual.

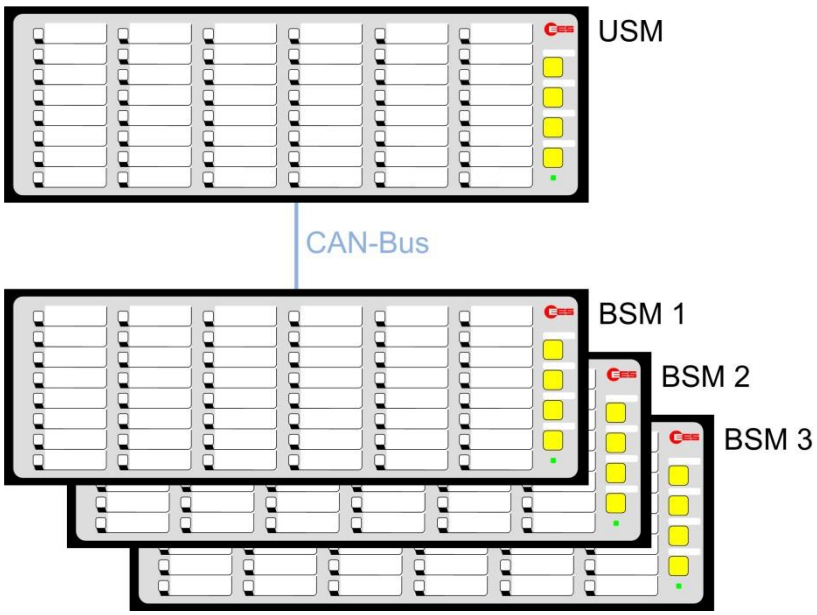


Fig. 3.1: General design of a cascaded fault annunciator system

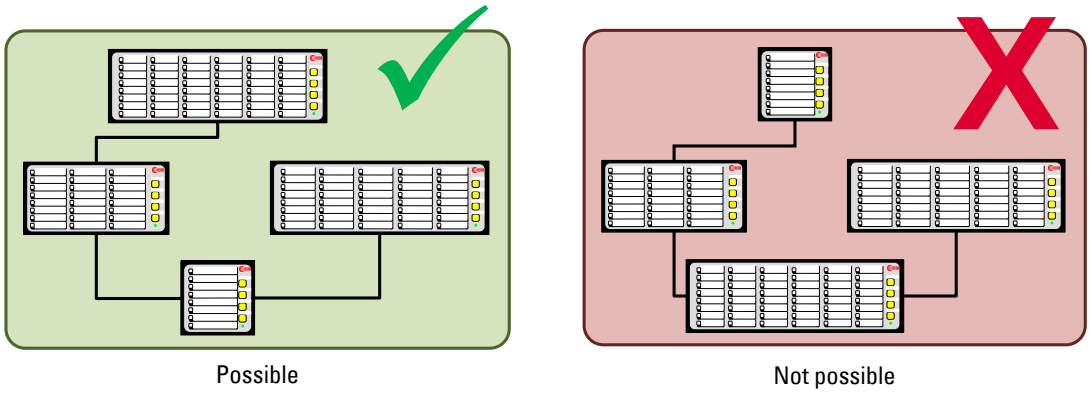


Fig. 3.2: Examples of cascaded annunciator systems

3.5 Protocol interfaces

For communication to superior or inferior systems (e.g. SCADA or PLC) the USM provides one or two interface cards. These contain the following interfaces:

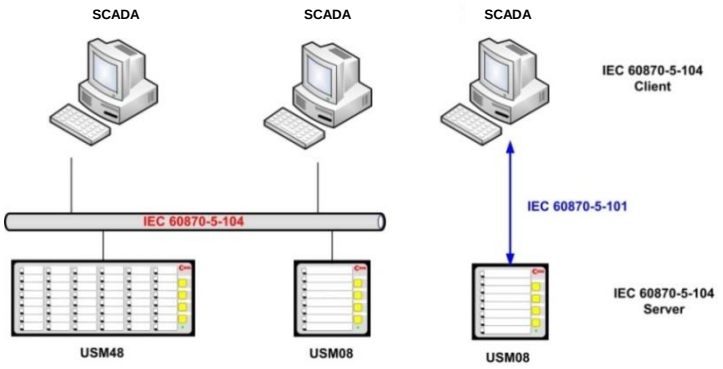
Card 1 (always equipped)
- 1 x Ethernet / RJ45
- 1 x RS232 (optionally RS485) / pluggable terminal
- 2 x USB-A
- 1 x CAN-Bus / RJ45
- 1 x USB-B (factory interface)

Card 2 (optionally equipped)
- 1 x Ethernet / RJ45 or LWL SC-Type
- 1 x RS232 / pluggable terminal

Through these interfaces the fault annunciators can communicate to third party systems via the following protocols:

- IEC 60870-5-101 (USM is IEC-Slave)
- IEC 60870-5-104 (USM is IEC-Server)
- IEC 61850 (USM is IEC-Server)

The fault annunciator can establish connections to a maximum number 4 Clients (Multilink). The combination of multiple of the above mentioned protocols within one annunciator is possible.



In this application example, the USM annunciators act as acquisition devices which process and display alarms locally. In addition, the alarms are forwarded to the SCADA level through IEC 60870-5-101 or -104.

Fig. 3.3: Application example for communication of USM acquisition devices (IEC-Server/Slave) with an IEC-Client/Master.

The single alarm channels can alternatively be triggered from the galvanic input or from the IEC interface. These options can be chosen individually for each channel. Acknowledgement through the IEC interface is possible as well.

3.6 Protocol IEC 61850 (optional)

In automated substations information from field- and protection devices are transmitted through the protocol IEC 61850.
In addition, various specific single point alarms are available which – depending on the type of information – need to be transmitted to the SCADA system or to other devices on field or station level. The annunciators adopt this “rag-man“ functionality and provide these single point information on the integrated IEC 61850 server.
Individual reports and datasets can be configured easily which contain all relevant information about the alarm and device status.
The IEC 61850 communication can be enabled in every USM by means of a license key.

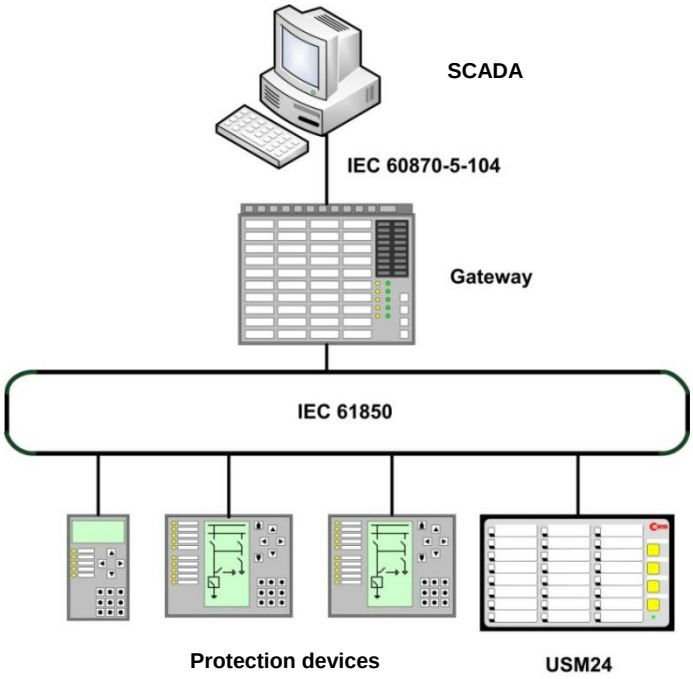
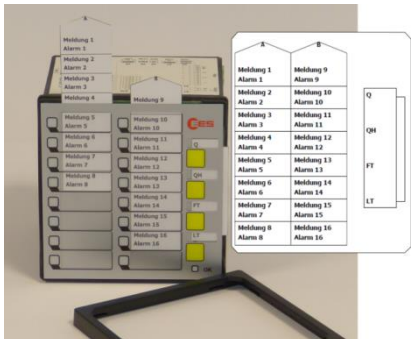


Fig. 3.4: With the optionally available software license IEC 61850 the USM can be integrated into IEC 61850 structures

3.7 Labelling



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 interface on the web-server or generated manually from labelling strips in Word-format.

Fig. 3.5: Insertion of labelling strips after removing the front frame

3.8 Monitoring LEDs, buttons and connections

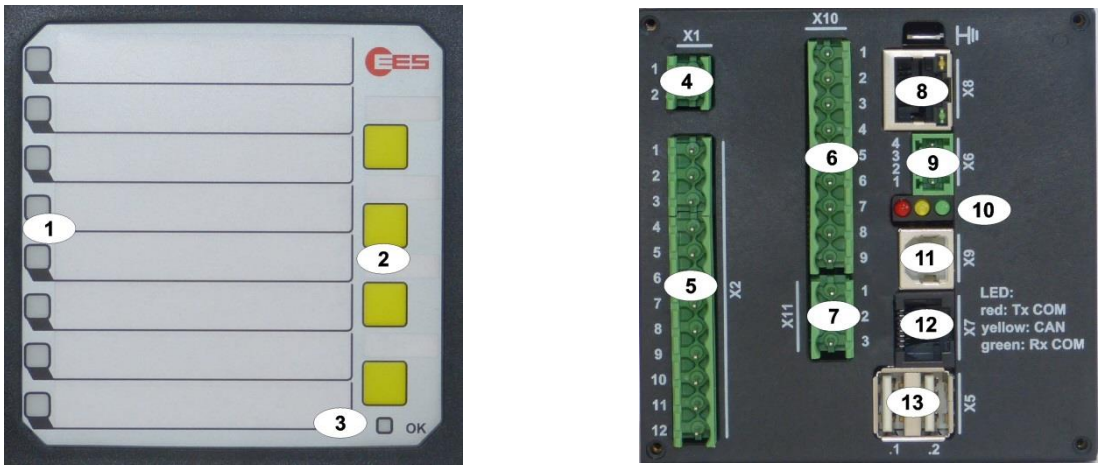


Fig. 3.6: Front- and rear view of the USM08

[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] LAN-connector (Ethernet / RJ45)
[9] Terminal serial interface (RS232 optionally RS 485)
[10] Watchdog-LEDs „Communication“
- red - Tx serial interface
- green - Rx serial interface
- yellow - CAN-Bus

[11] Service- and diagnosis interface USB-B (factory interface)
[12] CAN-Bus interface (RJ45)
[13] 2 x USB-A interface

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

3.9 Diagnosis

For monitoring and evaluation of the system functions different diagnosis information are available. These are e.g. the signalling of errors on watchdog LEDs or relay contacts or the provision of error information on the protocol interface by means of the data object “error”.

3.9.1 Watchdog-LED „Self-monitoring“

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.

3.9.2 Error codes

The hexadecimal error codes which are listed in the following table resemble the flashing sequence of the OK-LED of the USM. If the error code is transmitted through the protocol interface, it might – dependent from the superior system – be interpreted as decimal number.

Example:

Error 68 - *Connection to NTP Server disturbed*
Flashing sequence of OK-LED - *long, long, long, long, long, long short, short, short, short, short, short, short, short, pause*
Interpretation on the protocol-interface
hexadecimal - *0x68*
binary - *0110.1000*
decimal - *104*

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

Error code		Error	Remark
hex	decimal		
11	17	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	18	Internal error	
13	19	Overflow alarm buffer	After a surge of alarms, interstages of alarms can be lost. The final stages of the alarms are valid.
14	20	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	21	Communication within cascaded annunciator system disturbed	This error can occur in cascaded systems. It will be issued when the connection between the USM and at least one of the slaves (BSM) is disrupted. Please verify the configuration of the slave addresses and the connection cables.
17	23	Operating voltage 1	This error can occur in annunciators with dual power supply.
18	24	Operating voltage 2	
19	25	Configuration inconsistent	The downloaded configuration does not match the hardware of the device (e.g. USM08 and USM16).
31	49	License error	The IEC 61850 license does not match the device. Has the right license file been downloaded to the device? Please contact customer service.
32	50	CID-file missing	Please download CID-file to the device.
33	51	Parameter file missing	Download manufacturer file. Please contact customer service.
34	52	Imported configuration is faulty	Download correct file to the device or restore default setting by means of the web-server.
35	53	Faulty CID-file	The downloaded CID-file is incorrect. Please download the correct CID-file to the device.
68	104	NTP-connection	Connection to NTP-Server disturbed.

Table 3.1: Error codes of the USM

3.6 Terminal assignments

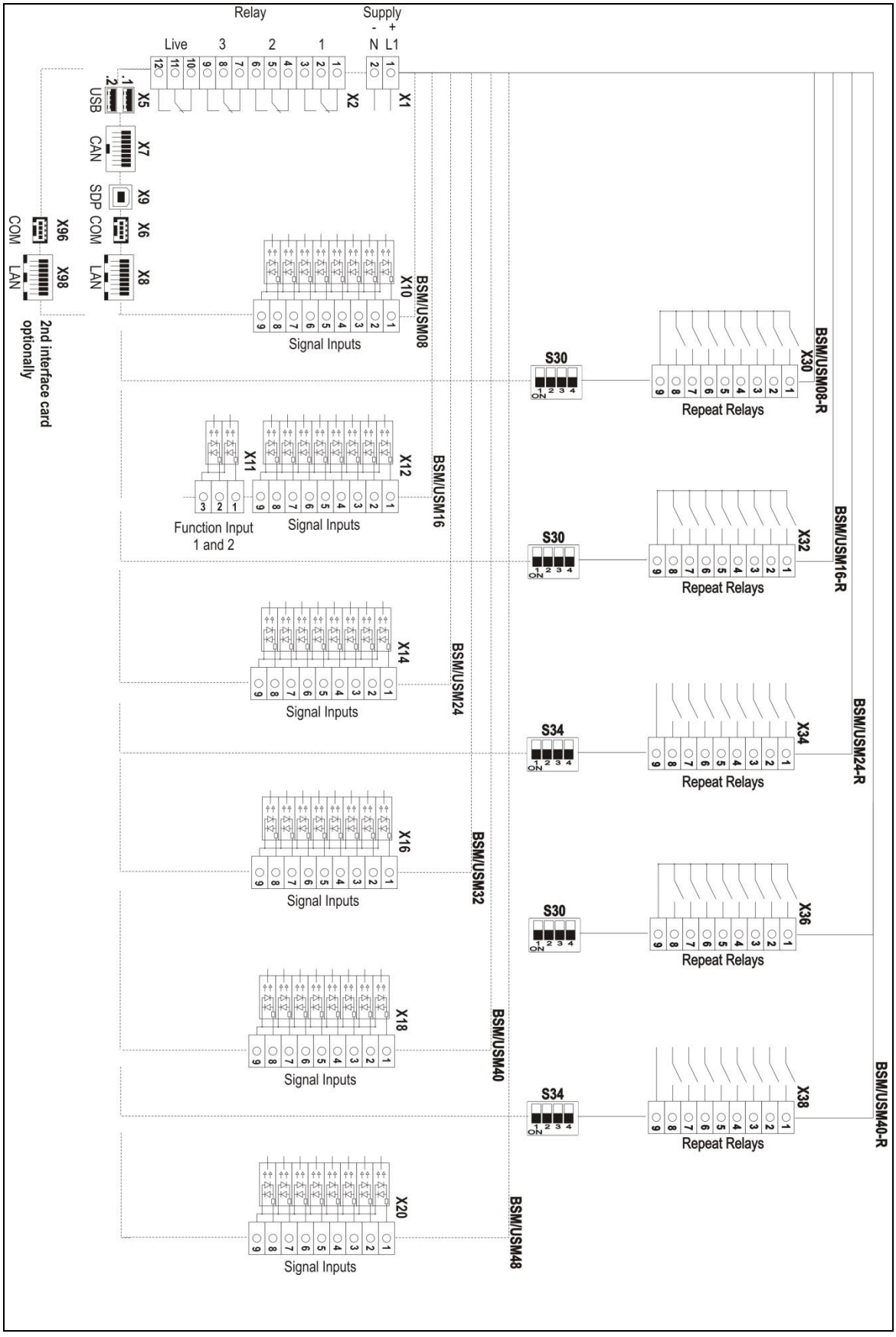


Fig. 3.7: Terminal assignment USM

3.8 Technical data

Supply voltage U_{Sup}

Key	Rated voltage	Voltage range
0	12 V AC/DC	10…19 V DC or 8…13 V AC
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 - USM

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]		
0	12	3	9	35	2,3
1	24	11	15	50	2,3
3	48	17	25	75	2,1
	60	17	25	75	2,7
E	60	42	54	75	1,6
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 - USM

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 consumption

Number of channels	Power consumption [W]	
	Without integrated repeat relays	With integrated repeat relays
8	< 8	< 10
16	< 9	< 13
24	< 10	< 17
32	< 10	< 15*
40	< 11	< 24
48	< 12	< 17*

Table 3.4: Power consumption - USM

* The power consumption 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	adjustable (5 ms … 9 h)
Flashing frequency	
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/USM	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 - USM

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

** An 16-way annunciator with 16 integrated repeat relays and/or 2nd interface card 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 terminals	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	
RS232/RS485 interface against	
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 (12 / 24 / 48 V AC/DC)	1,0 kV AC / 50 Hz 1 min
Relay contacts against each other	500 V / 50 Hz 1 min
Impulse withstand strength	
RS232/RS485 against	
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. Connect the fault annunciator to the network / LAN.

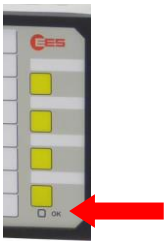
5. For a cascaded annunciator system, connect slave devices according to steps 2 and 3 and connect the cascaded annunciator to each other by means of a patch cable through the CAN-Bus-interfaces (terminal X7 at the USM and terminals X7/X8 at the BSM).

6. Connect the power supply and activate power supply.

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

7. Parameterise the fault annunciator (refer to section “Parameterisation”).

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



5 Parameterisation

The parameterisation of the USM is done through the integrated web-server by means of a web-browser. For access to the web-server, the network interface (terminal X8) of the USM has to be connected to the PC.

System requirements

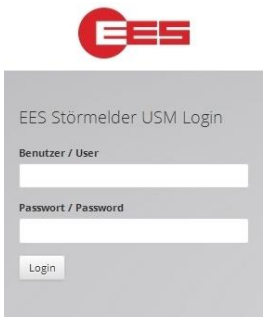
- Internet browser with **activated Javascript**
  - Mozilla Firefox from version 40
  - Internet Explorer from version 11
  - Update to latest version is recommended
- Recommended monitor resolution from 1280 x 800

The configuration interface can be accessed from the browser http://<IP-Address>.

The default IP-address of the USM is as follows:

USM 192.168.1.99

Please take into account the network settings at your PC and the configuration of the network.



For the first login please use the following login data:

User: admin
Password: admin

Fig. 5.1 Login

The passwords can be changed in the menu „Parameter / System / Security“.

The identification of the user is done by a random 32 byte session ID. No cookies are used. Up to 8 sessions (subscribed users) can be handled at a time. The number of “admin” sessions is limited to one at a time. Sessions are monitored by a time-out and closed automatically upon exceeding the time.

After login the home-page is opened.

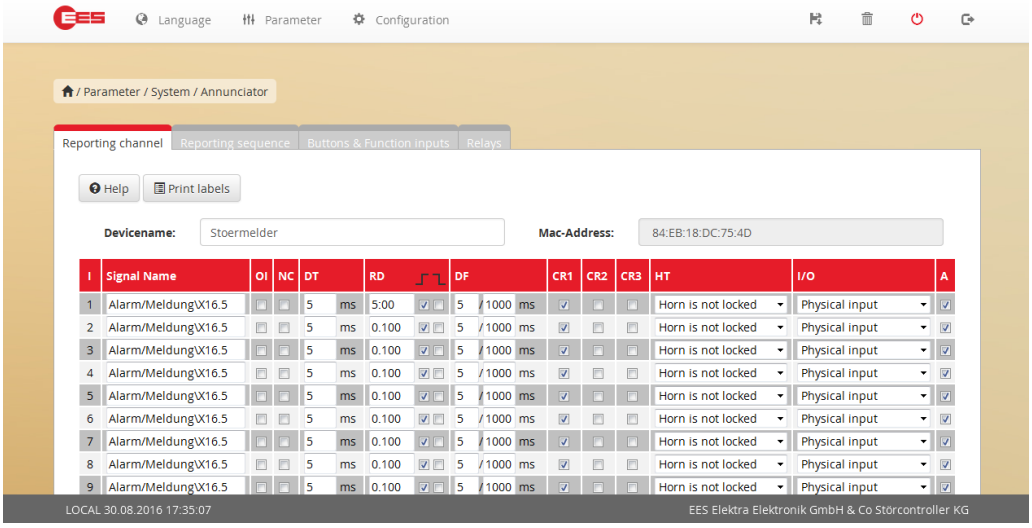


Fig. 5.2: Homepage of the USM web-server

Next to the EES logo the menu bar contains the three main menus:

- **Language**
- **Parameter**
- **Configuration**

and the symbol bar consisting of four buttons:

- **Accept configuration**
  Storage and activation of the changed parameters in the fault annunciators. After finishing the parameterisation, the new parameters have to be accepted and thus stored into the device.
- **Dismiss configuration**
  Dismissal of all changes done in the session (since last “accept configuration”).
- **Restart**
  Restart of the USM.
- **Logoff**
  Logoff from the web-server of the fault annunciator.

In the main window the menu “Parameter / 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.

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.

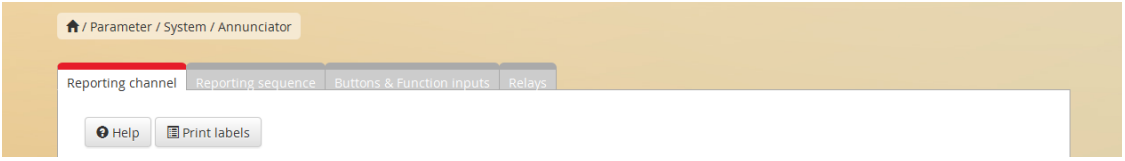


Fig. 5.3: Tabs and buttons on the page “Annunciator”

When switching the menus or tabs, changes will be stored but not taken over into the current configuration of the annunciator.

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

5.1 Main Menu Language

The parameterisation interface can be changed between German and English here.

5.2 Main Menu Parameter

This main menu is separated into two groups “System” and “Protocols”.

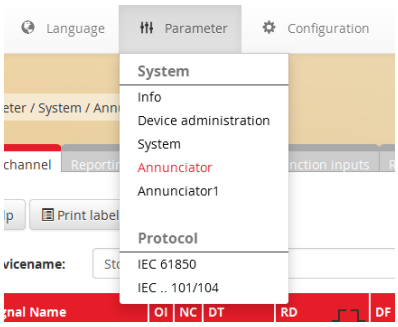


Fig. 5.4: opened main menu „Parameter“

Group System

- Info
  - Device information
  - Documentation
  - Logfiles
  - Help documents
  - Device monitor
- System
  - Time
  - Network settings
  - Security
  - Ex- and Import of parameter files
  - Firmware Update
  - License administration (IEC 61850)
- Annunciator (Annunciator functionalities)
  - Reporting channel
  - Reporting sequence
  - Push buttons & function inputs
  - Function relays
  - Repeat relays
  - LED-colour settings
- Annunciator ++
  - Parameterisation of cascaded annunciator systems with up to 4 fault annunciators

Group protocols

- IEC 61850
- IEC 60870-5-101/104

5.2.1 Menu Info

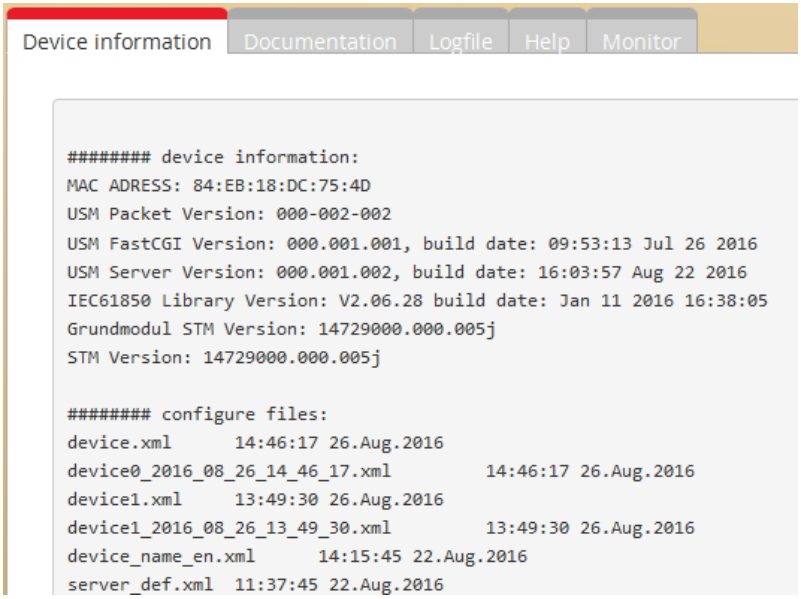


Fig. 5.6: The page „Info“ structured with 5 tabs

The menu is structured into sub-menus by 5 tabs:

Sub-menu Device information
On this page information about the release version of the software of the single program parts is displayed.

Sub-menu Documentation
Here the device documentation in PDF-format can be found.

Sub-menu Logfile
On this page the system-logfile can be opened or exported. To open this file, any text program e.g. WordPad can be used. The logfile contains a protocol of events like system start, login and logoff as well as parameter changes.

Sub-menu Help
Here all help-files are concentrated which can be accessed by the help-buttons in the respective menus.

Sub-menu Monitor
The page monitor offers diagnostics for the USM. On this page the LEDs of the annunciator are displayed with their current status (flashing, steady light, off).

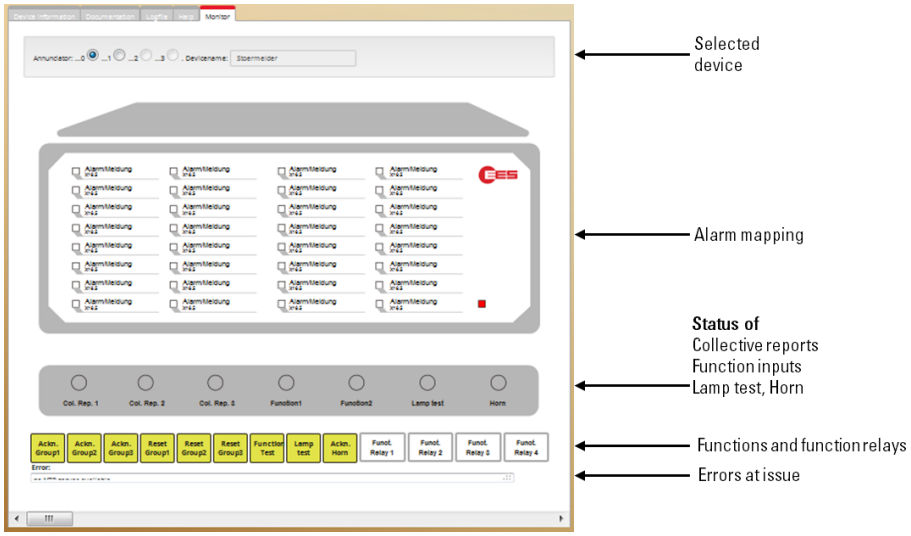
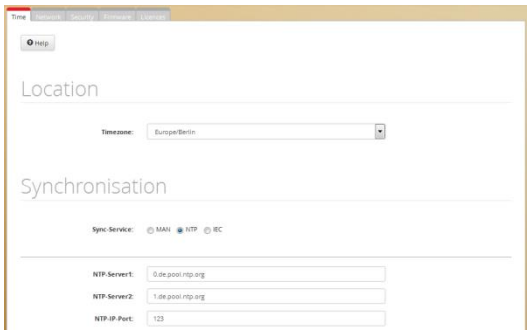


Fig. 5.7: Monitor – a diagnosis tool

The symbolically depicted push buttons can be “activated” by mouse click and the corresponding function is issued (acknowledgement, function test, …). The 4 function relays and – if available – the integrated repeat relays are depicted as well (red = activated, white = non-operating state). The repeat relays can be triggered by mouse click, if parameterised.

5.2.2 Menu System

Sub-menu Time



On the page „time“ the timezone and way of time synchronization can be defined. The internal real time clock of the annunciator can be set manually or synchronised cyclically by a NTP-server or the IEC interface.

Fig. 5.8: Sub-menu Time

Manual time synchronisation

With click on the button “set time” the manually entered time is sent to the USM.
With click on the button “set actual time” the PC time is sent to the USM.

Synchronisation by NTP

For time synchronisation two alternative NTP-server can be used. For this the server name or IP address as well as port number of the service need to be defined. If a Universal Annunciation Server (USS) from EES is used within the network, this can provide a time-server. To use the USS’ time server, please enter the USS IP address instead of the server name.

Synchronisation by IEC

Alternatively, the time can be synchronised with the SCADA system connected through the IEC interface.

Sub-menu Network
The USM provides one network interface (network 0) as standard. Optionally the fault annunciator can provide a second network interface (network 1). Both interfaces are completely separated and need to be operated in two independent networks.

If the USM provides two network interfaces, the two IP addresses have to be in separate networks. Otherwise the annunciator might not be addressable through network anymore.

IP-Address
IP-Adress of the fault annunciator in the local network. This address is used for communication to a client (SCADA system or USS) and for parameterisation.

The IP address entered here must be outside of a possibly existing DHCP-range of the router or DHCP server.

Please note that activation of a new IP address with „accept configuration“ will interrupt the connection to the fault annunciator. The connection has to be established again with the new IP address.

Subnet mask
Please enter the subnet mask for the network used.

Gateway IP address
If the network communication is realised through more complex structures (e.g. if the NTP server is available through a gateway only), please enter the gateway IP address here.

DNS-Server
Two alternative DNS-server can be entered here.

Sub-menu Security
The passwords for the two users admin (with authentication) and user can be changed here.

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.

Sub-menu Export/Import
On this page the configuration of the fault annunciator can be stored as ucf-file or a parameter file can be loaded. Additionally the configuration can be exported in html-format for documentation purposes. If the USM is the master device of a cascaded annunciator system, the parameterisation of the up to 3 slave devices can be exported or imported as well. For this, please choose the respective slave device (1…3) by activating the respective tick box. A slave device can only be chosen here, if it has been generated in the parameterisation of the annunciator functionality.

Sub-menu Firmware
If a firmware-update is required for the USM, the respective firmware-file can be uploaded into the device on this page.

Sub-menu Licenses
The USM povides communication through the protocol IEC 60870-5-101/104 by default. Optionally the annunciator can provide communication through IEC 61850. For this communication a license is required. If the license has not been installed by EES, the license file can be installed from this page after being provided by EES.

5.2.3 Menu Annunciator

In the menu “Annunciator” the fault annunciation functionalities of the device can be parameterised. This menu contains the following sub-menus:

- Reporting channel
- Reporting sequence
- Buttons and function inputs
- Function relays
- Repeat relays
- LED-colour

5.2.3.1 Submenu Reporting channel

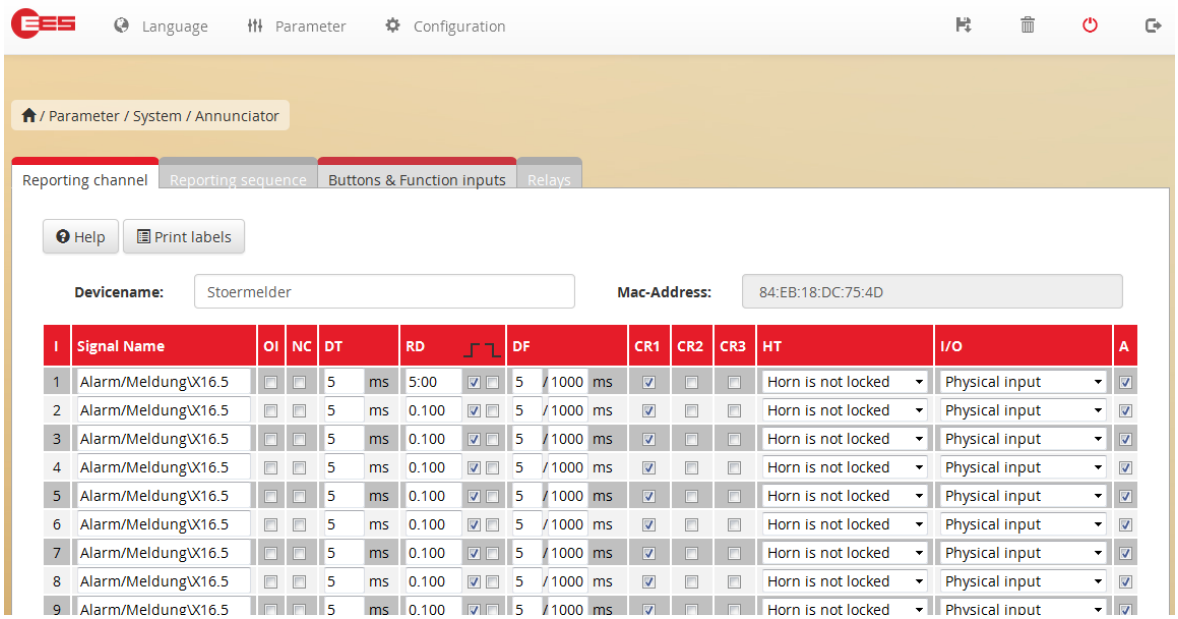


Fig. 5.9: Page reporting channel

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 USM when parameterised and stored there.

MAC-address
In this field the MAC-address of the USM is displayed.

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.

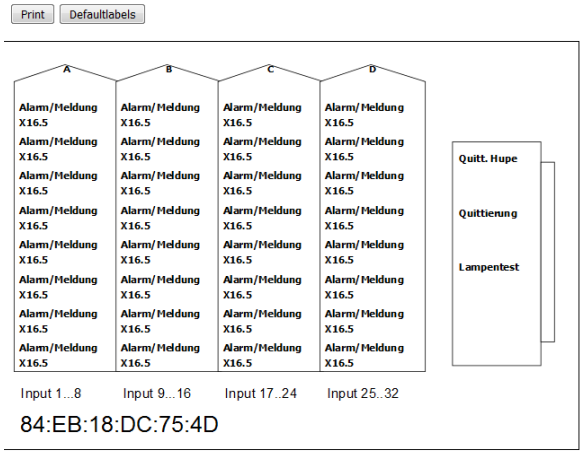


Fig. 5.10: Printing version of a labelling strip

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 and can be set from 0 ms … 9h in steps of 1 ms. 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 5.1a: Parameters of reporting channel

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
I/O	**Triggering of the alarm channel** The source of the signal for each channel can be defined with this checkbox. Checkbox ticked: IEC Client (SCADA or USS) through interface Checkbox unticked: corresponding galvanic signal input Default setting: unticked
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 5.1b: Parameters of reporting channel

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”).

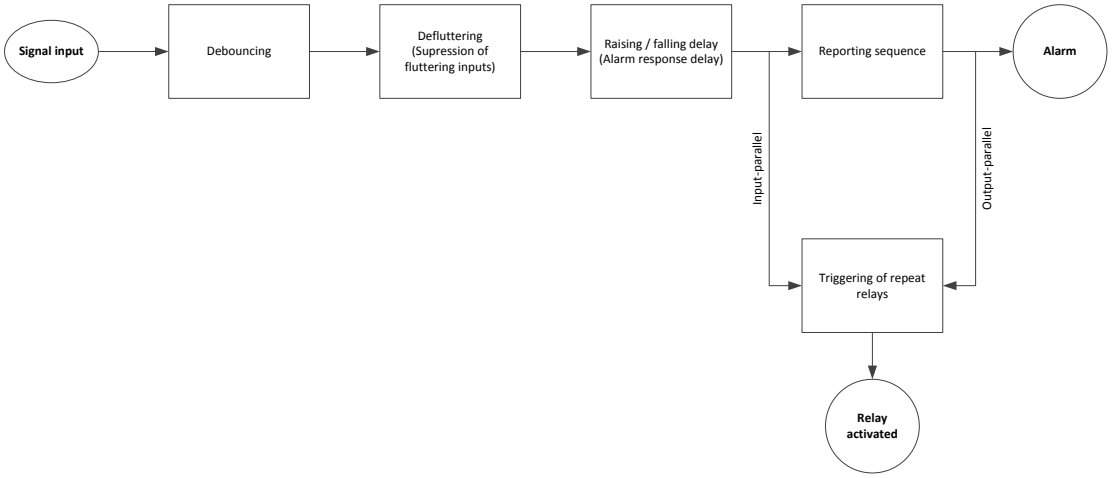


Fig. 5.11 Schematic illustration of the alarm processing in the USM

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.

5.2.3.2 Sub-menu Reporting sequence

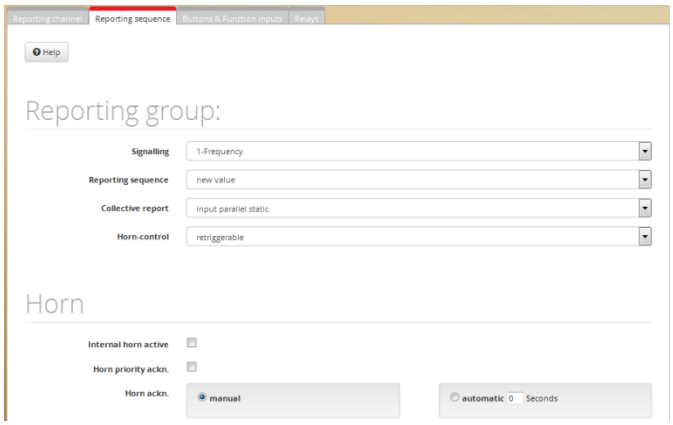


Fig. 12: Page Reporting sequence

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 5.2: 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 5.3: 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.

5.2.3.3 Sub-menu Buttons & Function inputs

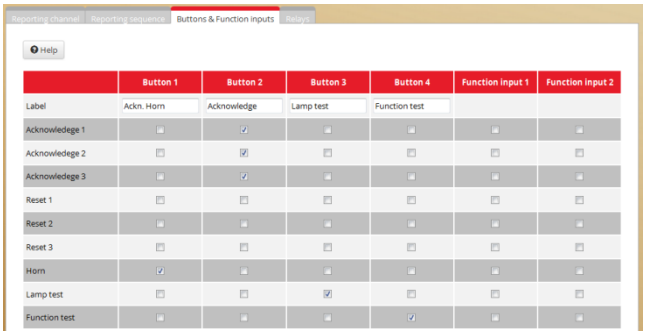


Fig. 5.13: Sub-menu assignment of buttons and function inputs

On this page, the specified functions can be assigned to the push buttons 1…4 and the function inputs 1&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 5.4: 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.

5.2.3.4 Sub-menu Relays (function relays)

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

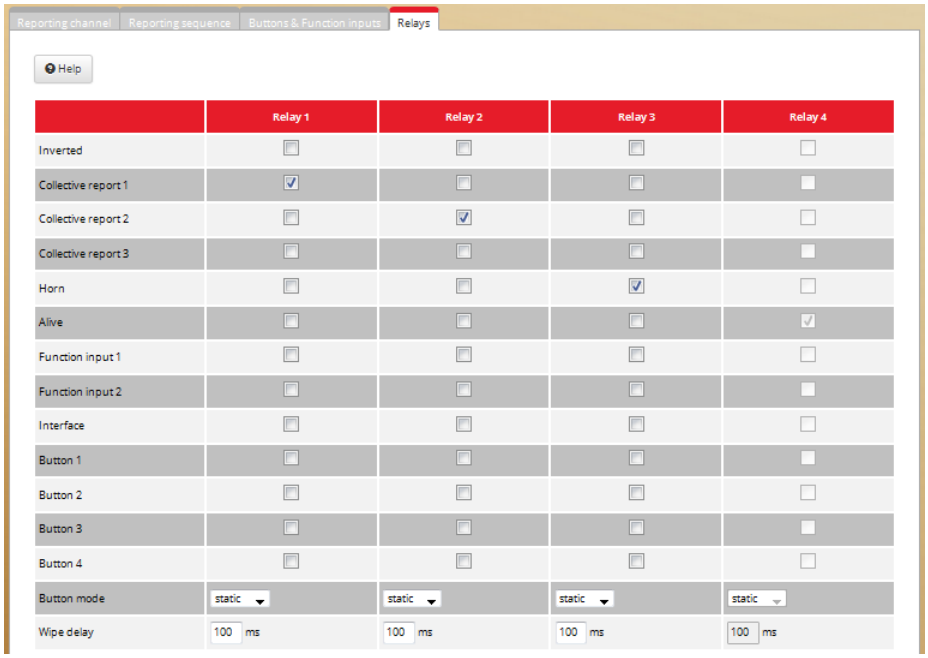


Fig. 5.14: Page Relays

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
Interface	Triggering from IEC interface (pulse commands with below defined wipe duration possible)
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 5.5: 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.

5.2.3.5 Sub-menu Repeat relays

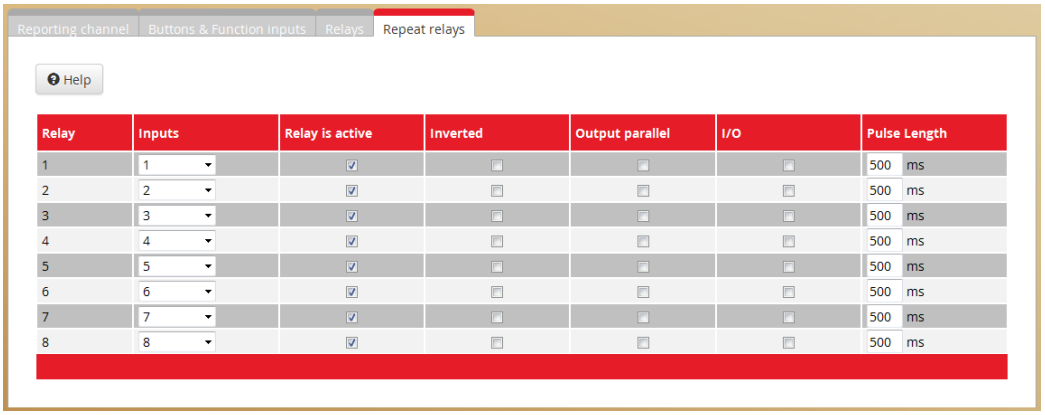


Fig. 5.15: Page Repeat relays

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 (default setting) – Relay follows the stored alarm (= output parallel)

I/O
If the relay is to be triggered from the IEC interface instead of a galvanic signal input or a function, this box needs to be checked. Please note that in this case a respective IEC-object needs to be defined for the relay in the protocol settings.

Pulse length
If a relay is triggered from the IEC interface, the pulse width can be defined here in the range from 10…10000 ms.

5.2.3.6 Sub-menu LED-colour

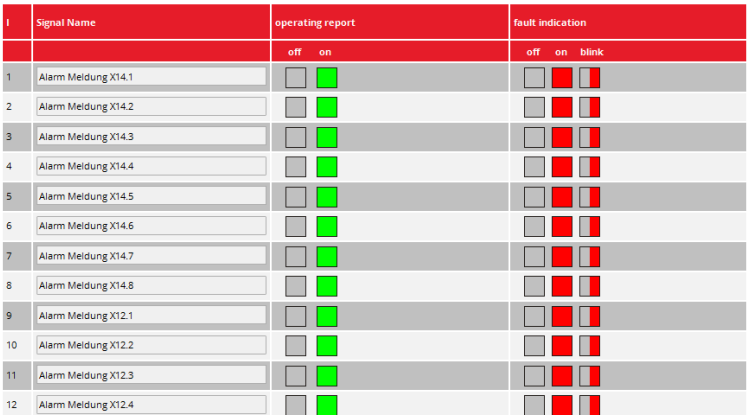


Fig. 5.16: Page LED-colour

On this page the LED colours for the operation modes “operation indication” and “fault annunciation” of each channel can be defined.

Operation indication
For the two conditions (Off and On) the colour can be chosen:

- LED off
- LED-colour red
- LED-colour green

Fault annunciation

For fault annunciation signals the colour for the signal conditions „off“ and „on“ can be defined. Additionally, the LED colour for “flashing-off” can be defined. This colour can be chosen indepently from the colour of the status “off”. The colour for “flashing-on” is the colour of the status “on” and cannot be changed.

5.2.4 Menu Annunciator ++

From a USM (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). Through the protocol interface of the USM all alarms of the complete system can be accessed.

The communication between the master and slave devices is realized through the integrated CAN-Bus interface. The USM 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 that the BSM devices have to be set to slave-mode by DIP-Switch and the respective slave addresses (1…3) have to be defined.

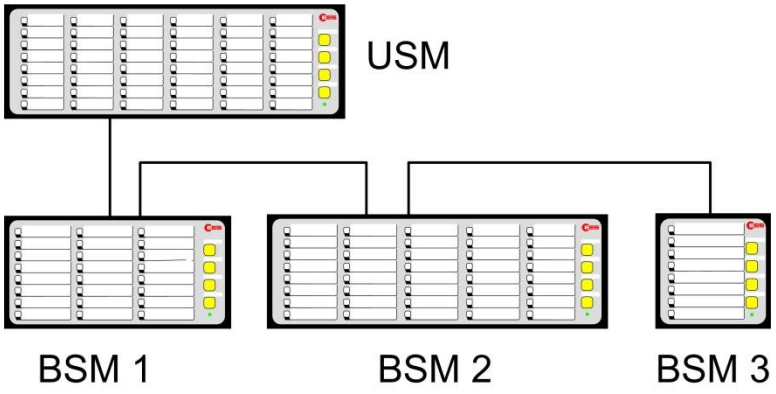


Fig. 5.17: Example of a cascaded annunciator system

After click on the menu “Annunciator++” in the main menu “Parameter” a new window opens offering the possibility to add a new slave device. Please choose the respective type of annunciator and close the window with the red button on the bottom right side.

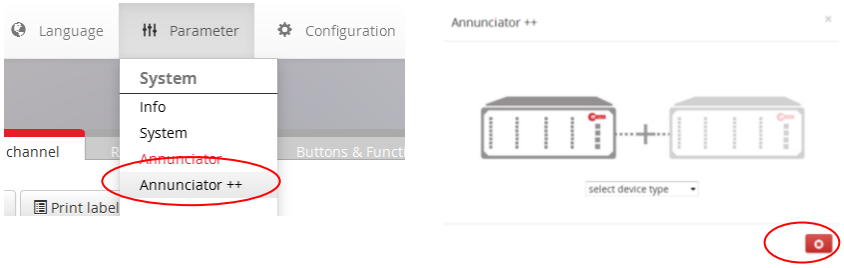
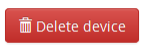


Fig. 5.18: Definition of a new slave fault annunciator

Subsequently the menu of the new slave annunciator is opened and the device can be parameterised. The menu of the slave correlates with the menu of the USM (→ section menu “Annunciator”). The tab “Reporting sequence” is missing – the sequence of the slave devices is identical with the sequence of the USM.
The additional button



allows for removal of the annunciator from the configuration.

After accepting the configuration of the slave device the parameters of the slave annunciator are stored in the USM and distributed automatically to the slave devices.

The slave device is displayed independently from the parameterised devicename as Annunciator1(…3) in the main menu and can be further parameterised.

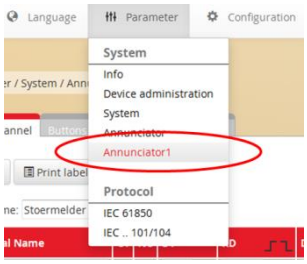


Fig. 5.19: Display of the new defined slave annunciator

A maximum number of three slaves can be defined in this way.

Please note: To ensure failure-free operation of the cascaded annunciator system, the CAN-Bus needs to be terminated. For this, every BSM is delivered with a terminating resistor that has to be plugged into the free CAN-Bus-socket of the last slave device.

5.2.5 Menu IEC 60870-5-101/104

In this section the abbreviation “IEC” is used as synonym for IEC 60870-5-101/104.

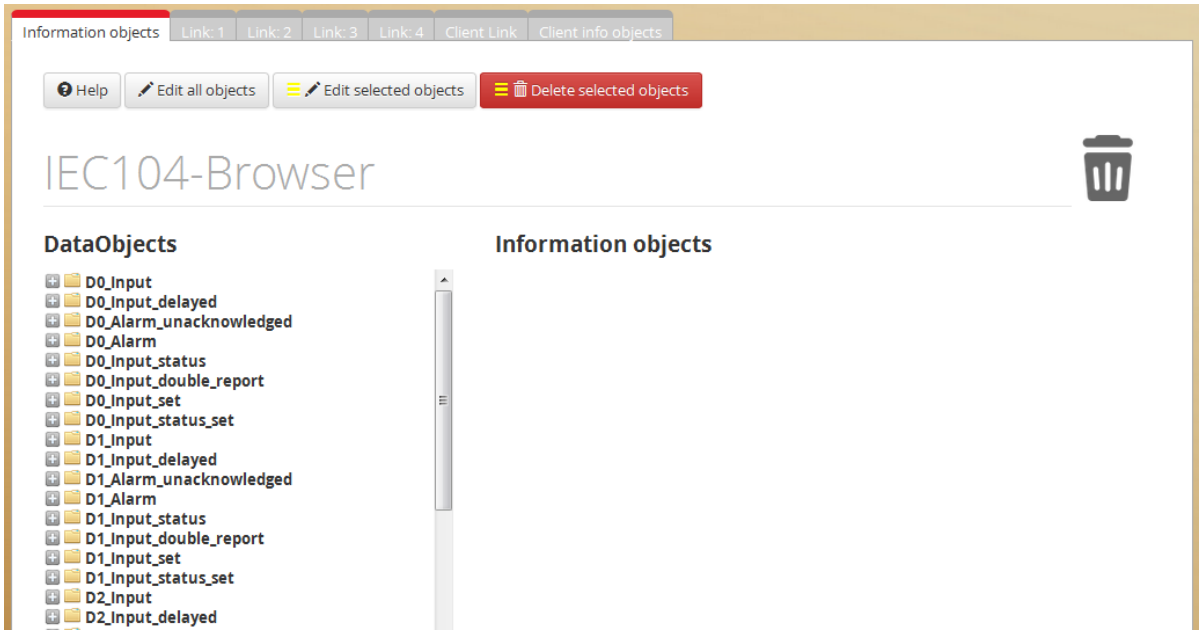


Fig. 5.20: Menu IEC 60870-5-101/104

In this menu the settings for the protocol interface(s) IEC 60870-5-101/104 can be defined.

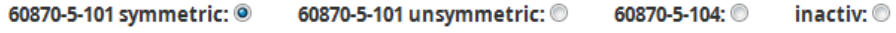
The page is structured into 6 sub-menus by means of tabs.

- Information objects (Objectbrowser)
- Link1 … 4
- Edit Object (Editing of the information objects)

5.2.5.1 Submenu for parameterisation of the 4 IEC-links

The USM provides a multilink interface for IEC 60870-5-101/104. This means that the device can communicate with up to four clients. A separate sub-menu exists for each of these possible 4 links.

In the upper area of the page the interface that is to be used on the respective link can be defined by 4 checkboxes.



For links 1 and 2 you can choose from all 4 options. Links 3 and 4 can only be used for IEC 60870-5-104 communication or set to inactive.

If the serial interface IEC 60870-5-101 is used, the possible two serial interfaces are assigned automatically as follows:

Link 1 – X6
Link 2 – X86 (optional interface)

Parameter	Value range	Default setting
Baud rate	110, 300, 600, 2400, 4800, 9600, 38400, 57600 or 115200	38400
Parity bit	none, even, odd	even (IEC-standard)
Link address length in Byte	0, 1, 2	2 Byte
Link address	1...65534 (structured or unstructured *)	1
ASDU address length in Byte	1, 2	2 Byte
ASDU address	1...65534 (structured or unstructured *)	2
ASDU valid per link	In the sub-menu “Edit objects” an individual ASDU address can be assigned for each object. When checking this tickbox, this assignment is invalid. Only the here defined ASDU address is valid for the whole link.	active
Information object address length	2 Byte (resulting address range 1 … 65534) 3 Byte (resulting address range 1 ... 16777215)	3 Byte
Origin address	The defined origin address is valid for the whole link.	1
Origin address length	deactivated – address not used activated – origin address is used	activated
Single signal acknowledgement	IEC 60870-5-101/104 offers the possibility for telegram acknowledgement with a single signal **<E5>,** instead of a whole telegram. With this checkbox you can define if the single signal acknowledgement of IEC request telegrams.	activated
Link scaling	The following scaling actions can be activated: • Link-reset • Link status request • Userprocess-reset Multiple activations are possible	Link-Reset Userprocess

Table 5.6: Parameters for IEC 60870-5-101 interface symmetric or unsymmetric

Depending on the communication partner, furthermore the following parameters can be set:

- Interval test telegrams
- Acknowledgement timeout T1
- Link timeout
- Whole link timeout
- Number of successor objects

* You can switch between structured and unstructured address format with the button “Structured/unstructured address”.

Parameter	Value range	Default setting
ASDU address	Address length 2 Byte 1...65534	2
ASDU valid per link	In the sub-menu “Edit objects” an individual ASDU address can be assigned for each object. When checking this tickbox, this assignment is invalid. Only the here defined ASDU address is valid for the whole link.	active
Origin address	The defined origin address is valid for the whole link.	1
IEC Client IP-address	IP-address of the IEC client (SCADA system) which is allowed to connect this link. When the IP address 0.0.0.0 every client is allowed to connect.	0.0.0.0
IP-Port	Port number for IEC communication (IEC-default is port 2404)	2404

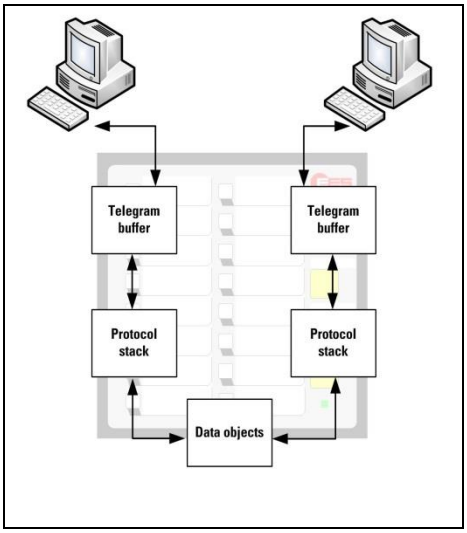
Table 5.7: Parameters for IEC 60870-5-104 interface

Depending on the communication partner, furthermore the following parameters can be set:

- Interval test telegrams
- Acknowledgement timeout T1
- Whole link timeout
- Number of successor objects
- Assignment to a redundancy group

The IEC connections can be operated in parallel and/or redundant to each other.

Parallel operation



Redundant operation

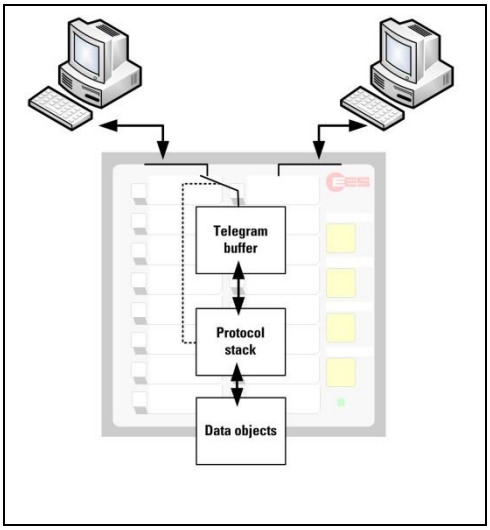


Fig. 5.21: Example for parallel and redundant operation of two Masters / Clients

In parallel operation the information is sent to all parameterised Masters / Clients at the same time. Parallel operation is possible for IEC 60870-5-101 and -104 connections.

In redundant operation the single connections of a redundancy group are working alternatively.
If one Client of a redundancy group fails, the data is sent to another Client. Determination of which Client is the currently active Client is done through the interface by the Clients. Redundant operation is possible only for IEC 60870-5-104 connections.

5.2.5.2 Sub-menu information objects

On this page the data objects available in the fault annunciator can be edified as information objects. For this a data object is selected by click with the left mouse button and dragged to the position after which it is to be inserted in the information object list. The data objects cannot be edited or deleted and depend from the annunciator variant and connected slaves in a cascaded system, if applicable.

In the following list of available data objects “X” acts as placeholder and can have the following values:

0 Data objects of the USM
1 Data objects of the Slave 1 (only available in cascaded systems)
2 Data objects of the Slave 2 (only available in cascaded systems)
3 Data objects of the Slave 3 (only available in cascaded systems)

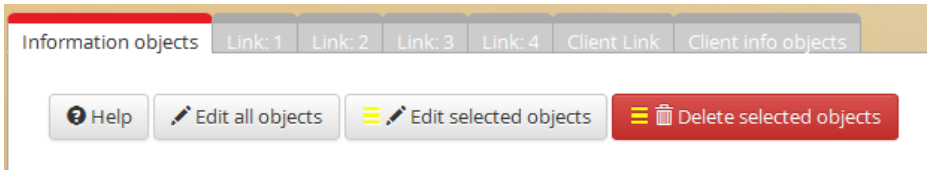
For each fault annunciator the following data objects are available:

DX_Input	- physical, not stored status of the signal input without regard of delay times (input parallel signal)
DX_Input_delayed	- Status of the signal input after expiration of the delay times (delayed input parallel signal)
DX_Alarm_unacknowledged	- the stored alarm is at issue or has already receded, but has not been acknowledged (stored alarm)
DX_Alarm	- the alarm is at issue and is stored (output parallel) for 2-frequency sequence – alarm is not reset (stored acknowledged alarm)
DX_Input_Status	- issue of the alarm status with possible status values 1…4
DX_Input_double_report	- undelayed issue of two signal inputs as double alarm Always two inputs (odd channel and even channel) are combined to one double alarm. The resulting data object has the number of the odd channel, e.g. X16.1 and X16.2 → D0_InDouble1_Alarm/Meldung_X16.1.
DX_Input_set	- Triggering of the alarm channel (channel defined as output)
DX_Function_output	- Status of the function relays 1 ... 4 (not triggered / triggered)
DX_Function_out_set	- Triggering of the function relays 1 ... 4
DX_Output	- Status of the repeat relays is read
DX_Output_set	- Status of the repeat relays is set accordingly
DX_Output_double_command	- repeat relays are triggered by command as double command Two ouputs (odd channel and even channel) are combined to one double command, e.g. X30.1 and X30.2 → D0_Ausgang_Doppelbefehl_1.
DX_Button	- The function assigned to the respective button (1…4) is triggered.
DX_Function_input	- The function assigned to function inputs 1 or 2 is triggered.
Error	- Device error detected (Type of the error → section error codes)
Special Channels	- Collective report 1, 2 or 3 triggered Horn triggered Lamp test triggered and still active

Commands	- Acknowledgement of the collective report groups 1 .. 3 - Reset of the collective report groups 1 .. 3 - Acknowledgement of the horn - Execute function test - Execute lamp test

Idle information objects can be dragged into the paper bin. Alternatively, selected objects can be deleted with the button “Delete selected objects”.

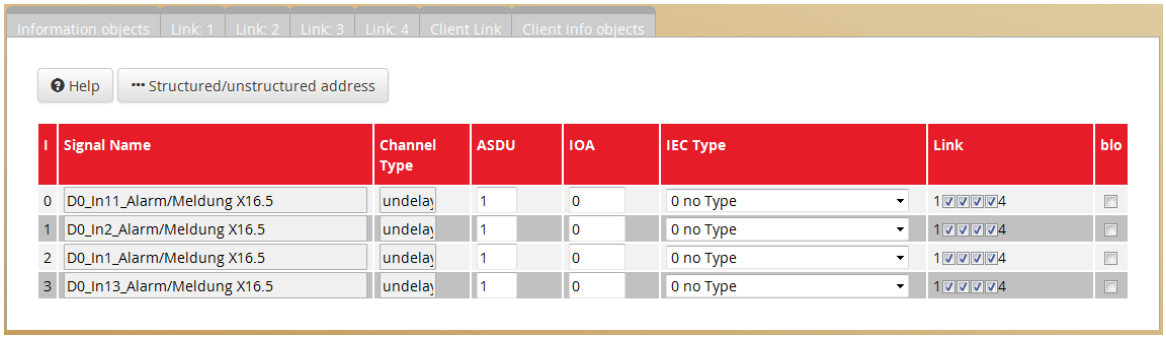
In the next step, IEC addresses and object types have to be assigned to the information objects. There are three possible ways to do this:



1. Assignment for a single object by double clicking on the respective object.
2. Assignment for selected objects by click on the button “edit selected objects”. Objects can be selected and de-selected by click.
3. Assignment for all objects by click on the button “edit all objects”.

For all three ways, subsequently the sub-menu “edit objects” is opened.

5.2.5.3 Assignment of object addresses and types



The menu contains the following settings and parameters:

Signal name
Labelling of the channel, according to the menu “Annunciator”. This field cannot be changed in this menu.

Channel type
Marks the type of the object according to the sub-menu “information objects”. This field cannot be changed.

ASDU / IOA
ASDU (2 Byte) and IOA (3 Byte) can be entered in structured or unstructured format. The format of the address can be changed with the button „***Address format“.

If the checkbox „ASDU valid per link“ in the sub-menus „Link 1 …4“ is activated, this assignment is invalid. Only the here defined ASDU is valid for the whole respective link.

Information object type (IOT)

In this field the IEC-type of the object can be defined. The following types are available:

Type	Meaning	
1	- Single report	M_SP_NA_1
2	- Single report with short timestamp	M_SP_TA_1
3	- Double report	M_DP_NA_1
4	- Double report with short timestamp	M_DP_TA_1
5	- Step position	M_ST_NA_1
6	- Step position with short timestamp	M_ST_TA_1
7	- Bit pattern of 32 Bit	M_BO_NA_1
8	- Bit pattern of 32 Bit with short timestamp	M_BO_TA_1
30	- Single report with long timestamp	M_SP_TB_1
31	- Double report with long timestamp	M_DP_TB_1
32	- Step position with long timestamp	M_ST_TB_1
33	- Bit pattern of 32 Bit with long timestamp	M_BO_TB_1

Link

By activating the respective checkboxes the object is available on link 1…4. Multiple assignments are possible.

blo
When this checkbox is ticked the alarm indicated as blocked (quality bit) and value changes are not forwarded to the IEC interface.

Contact

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