

Fault Recorder Systems

User Manual SHERLOG Operating Software

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SHERLOG operating software

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SHERLOG operating software

1 SHERLOG operating software

The SHERLOG operating software consists of two parts: **Online** for the operation and management of SHERLOG devices and **Analysis** for the evaluation of records.

1.1 SHERLOG-Online for operation

The **Online** part of the software offers many possibilities, ranging from the operation of an individual fault recorder up to the administration of complex fault recorder groups.

The ergonomic graphical user interface, designed according to the Windows[®] Fluent concept, is geared to meet real-world requirements and provides a wide range of functions, including the following:

- Flexible configuration for optimum customisation to measurement tasks with due consideration of the network model
- Fully automatic measurement with
 - Remote data transmission
 - Determination of fault type and fault location
 - Printout or dispatch of fault reports or quality reports
 - Records are archived in a database
 - Online monitoring
 - Self-monitoring
- Easy-to-use manual functions for data evaluation and report creation
- Remote configuration
- Can be used with several screens (optimum overview, all information can be seen at a glance)

1.2 SHERLOG-Analysis for analysis

The **Analysis** part of the software is used for the evaluation of records made by SHERLOG CRX measuring systems.

The software includes a wide range of powerful analysis tools for assessing the recorded data:

- Useful zoom functions and variable scaling
- Simultaneous display, superimposition and synchronisation of more than one fault record
- Vector displays
- Harmonic analysis on the basis of full waves or to IEC 61000-4-7 with interharmonics
- Nyquist plot
- Determination of fault location
- Freely configurable absolute and delta measurement cursors
- Formulary and formula editor for the calculation of further power system quantities
- Individual report creation using the clipboard
- Automatic report creation

Fault location

The powerful fault locator can characterise faults quickly to support maintenance staff as well as calculating the fault loop and detailing the fault type, fault impedance and fault location.

Mathematical signal analysis

A formula editor can be used to make further mathematical calculations within fault records. The results are added to the fault record as an additional signal.

Data formats

Import and export functions enable data to be exchanged between different systems using standard COMTRADE, CSV and PQDIF file formats.

2 About this document



This user manual describes how to operate and control a SHERLOG CRX fault recorder system and how to evaluate records on a PC with the SHERLOG operating software.

Separate operating instructions describe how to commission, connect, operate and maintain the fault recorder systems.

This user manual is intended for:

- Persons who know how to switch on and off, enable, earth and identify electrical circuits and devices/systems in accordance with the applicable safety standards.
- Trained operating personnel in electrical installations

2.1 Other applicable documents

A number of other documents apply in conjunction with this user manual. The manufacturer is not liable for damages resulting from failure to comply with information contained in any of these documents.

All documentation pertaining to the commissioning, configuration of settings, operation and maintenance of a SHERLOG CRX fault recorder system also applies.

Other applicable documents for the user:

SHERLOG CRX operating instructions

2.2 Validity of the present document

This user manual is valid only for the SHERLOG operating software in conjunction with a SHERLOG CRX fault recorder system.

2.3 Warning marks and symbols

2.3.1 Explanation of the symbols used in this document

Symbol	Explanation
4	DANGER This symbol indicates the presence of an immediate risk associated with electric voltage. If this risk is not avoided, death or serious injury may result.
	CAUTION This symbol indicates the presence of a potential risk associated with improper use. If this risk is not avoided, personal injuries or material damage may result.
	NOTE This symbol highlights notes and information.

2.3.2 Typographical conventions

Symbol	Explanation
	This symbol highlights instructions which require action on the part of the user
1. 2.	Numbered lists are used for actions which must be carried out in the order given
	This symbol marks the items of a list

3 Software

3.1 Recommended minimum PC requirements

To be able to use the SHERLOG operating software, the computer must fulfil the following minimum requirements:

- Windows XP professional, Windows 7 (32 or 64 bit) operating system
- Dual-core processor with at least 1.8 GHz
- At least 256 MB RAM main memory
- At least 500 MB HDD free hard drive space
- 10/100 Mbit Ethernet interface
- Graphics resolution 1024 x 768
- 19" TFT monitor (widescreen format)

3.2 Installation

The SHERLOG setup CD contains all the components required in order to install the software as well as this manual in PDF format. A PDF Reader (also included) is required in order to open the manual.



Before installing the SHERLOG operating software, it is important to ensure that the Windows operating system is up to date, i.e. that all updates have been installed and that the user is logged on to the PC with administrator rights.



The installation procedure for the SHERLOG operating software starts automatically as soon as the setup CD is inserted in the drive, providing this is permitted by the Windows[®] system settings.

If the existing installation is to be extended or reconfigured, the installation procedure can be repeated whenever necessary by running the SETUP.EXE file again.

Service packs and software updates included on the CD should only be installed if a message requiring this to be done is displayed during installation.

To install the SHERLOG operating software:

- **1** Close all Windows[®] applications.
- **2** Insert the SHERLOG setup CD in the drive.
- **3** Installation starts automatically.
- **4** Select the language of the installation programme.
- **5** Follow the instructions displayed on the screen for each installation step and carry out all the steps one after the other.
- **6** Once installation has been completed, restart the PC to activate the settings.

First steps

4 First steps

This chapter gives a brief description of how to put a fault recorder system into operation using the SHERLOG operating software. Detailed information on specific functions are given in separate chapters of this manual or in application notes.

The **Online** part of the software is used by way of example. However, it is also possible to use the **Analysis** part of the software instead and the procedure is similar to the one described here.

4.1 Start the software



 Click the appropriate entry in the **Programmes** folder of the Windows[®] start menu or the application icon on the desktop

4.2 User information

Welcome to SHERLOG 1.0	x
Welcome to SHERL	DG 1.0
On the first start you nee be defined to prevent una The username can be cha can be defined or changed	d to enter a username. Additionally a password can suthorized access. nged later in the account manager. The password d later, too.
Username:	KoCoS
Password (optional):	
	OK Cancel
Fig.: Log-in screen disp after installation	layed the first time the software is started



Fig.: Log-in screen displayed when the software is started subsequently

Log-in

It is necessary to enter a user name when the software is started for the first time.

If no changes have yet been made in the User Manager, the user name entered during installation is displayed here.

A password may be entered for the user, but this is optional and not compulsory.

The user name and password can be changed at any time. For more information, see under **User manager**.

Every time the software is started subsequently, a user name is to be selected and, if defined, the password is to be entered.

First steps

4.3 Licensing



In order to use the software on a permanent basis, the software licence must be unlocked within 30 days of installation.

Within the 30 day trial period, it is possible to start the software for test purposes without a licence by clicking the **Start** button.

4.3.1 Request unlock code

& Licence status	23	When the programme is started for the first time
A	Status	and every time it is started within the 30 day trial
Licence		period, the Status view is automatically called
	Product name Snenog 1.00	up, reminding the user to license the software.
Status	Expiry date 07.04.2013	
	Remaining evaluation period 30 days of 30 Days	
Request a tock	Licensee	In order to license the application, an unlock code
=	Volume ID N/A ····	must be obtained from the manufacturer.
1 Unlack	PC-ID 2BF4-7872-06C1-F813	
	Features	
	Has unlimited devices Available	Click the Request Unlock Code button
EULA	Sherlog device count 5	-
	ОК	
Chatur		
Julius		
Fig & Chatters	lianlay	3
Fig.: Status a	isplay	1
Fig.: Status a	isplay	The Request Unlock Code dialogue box is called
Fig.: Status a	Request unlock code	The Request Unlock Code dialogue box is called up
Fig.: Status of	Eisplay	The Request Unlock Code dialogue box is called up
Fig.: Status of	Eisplay	The Request Unlock Code dialogue box is called up > Enter data in the form
Fig.: Status of	EMal Ardess	The Request Unlock Code dialogue box is called up > Enter data in the form
Fig.: Status of	E Mail Adress	The Request Unlock Code dialogue box is called up Enter data in the form
Fig.: Status of	S Request unlock code Name E-Mail Adres Telephone number Licensee Department	The Request Unlock Code dialogue box is called up Enter data in the form Licence number
Fig.: Status of	Isplay	The Request Unlock Code dialogue box is called up Enter data in the form Licence number Enter the software licence number
Fig.: Status of	Isplay	 The Request Unlock Code dialogue box is called up Enter data in the form Licence number Enter the software licence number The licence number can be found on the label of
Fig.: Status of	Isplay	 The Request Unlock Code dialogue box is called up Enter data in the form Licence number Enter the software licence number The licence number can be found on the label of the installation CD
Fig.: Status of	Isplay	 The Request Unlock Code dialogue box is called up Enter data in the form Licence number Enter the software licence number The licence number can be found on the label of the installation CD.
Fig.: Status of	Isplay	 The Request Unlock Code dialogue box is called up Enter data in the form Licence number Enter the software licence number The licence number can be found on the label of the installation CD. Once all the required fields (!) have been filled in,
Fig.: Status of	Isplay Request unlock code Name E-Mail Adress Telephone number Leoruse Department Position ZIP code City Street Country Germany Licence number Index experiment Street Software/Windows version 10.4792.29491 Windows Vista/Serven Service Pack 1	 The Request Unlock Code dialogue box is called up Enter data in the form Licence number Enter the software licence number The licence number can be found on the label of the installation CD. Once all the required fields (!) have been filled in, the Submit button is displayed.
Fig.: Status of	Isplay	 The Request Unlock Code dialogue box is called up Enter data in the form Licence number Enter the software licence number The licence number can be found on the label of the installation CD. Once all the required fields (!) have been filled in, the Submit button is displayed. Click the Submit button
Fig.: Status of	Itsplay Request unlock code Name E-Mail Adress Telephone number Ucensee Department Poston ZIP code Oty Street Country Germany Vir Moduki Ike to be kept informed of the latest news and developments at KoCoSI	 The Request Unlock Code dialogue box is called up Enter data in the form Licence number Enter the software licence number The licence number can be found on the label of the installation CD. Once all the required fields (!) have been filled in, the Submit button is displayed. Click the Submit button The request is sent by email
Fig.: Status of Licence status Licence Status Request unlock Code Unlock Unlock EULA	Itsplay Request unlock code Name E-Mail Adress Telephone number Department Department Department Department Street Country Street Software/Windows version 10.4792.29491 Windows Vista/Seven Service Pack II V Iwould like to be kept informed of the latest news and submit K	 The Request Unlock Code dialogue box is called up Enter data in the form Licence number Enter the software licence number The licence number can be found on the label of the installation CD. Once all the required fields (!) have been filled in, the Submit button is displayed. Click the Submit button The request is sent by email

Fig.: Request Unlock Code dialogue box



Software licences (licence numbers) always apply to a specific PC! Volume licences for 5 PCs, for example, therefore include 5 licence numbers.

Licence	Status		
A	Product name	Sherlog 1.00	
State	Licence status	Licensed	
tin the second s			
Upgrade	Licensee	KoCo5 Messtechnik AG	
	Volume ID	ZX0Y-ZYUZ-LBSM-W0XJ	
EULA	PC-ID	D23C-A1C1-F453-D6F8	
	Features		
	Has unlimited devices	Available	
	Sherlog device count	0	
Ŧ			

PC-ID

The ID number of the computer on which the software has been installed is required for the generation of the unlock code. The PC-ID is retrieved automatically and entered in the application form.

If no internet connection is available, the request can also be made by telephone using the following number +49(5631) 9596-0

When requesting an unlock code by telephone, the following information must be given: the PC-ID as listed in the **Status** window, the software licence number and other licensee data.

First steps

4.3.2 Unlock



Fig.: Online start screen

Customize the user interface 4.4

Start	Device list	Configuration	View			۵ 🍕
Save	Lock	Skin:	ffice 2010 Blue	•	Language:	 About Show help License information
Scr	een Layout	19		Cu	stomize	Help

Call up the View tab \geq

screen background.

scheme

 \triangleright

Basic settings for the user interface, such as the layout, language and design, can be made here.

Various colour schemes are available for the

Open the Skin list and select a colour

4.4.1 Change the screen design

) ÷	SHEP	LOG	
Start Device list	Configuration View		۵ 🍕 .
Save Lock	Skin: Office 2010 Blue	Language:	 (i) About (i) Show help (k) License information
Screen Layout	Seven Classic Office 2010 Blue Office 2010 Blue Office 2010 Blue Uiguid Sky London Liquid Sky Glass Oceans Stardust	Wycomize	Help

Fig.: Set the screen design (skin)

4.4.2 Change the language

) +				SHERLOG		3 🗉 🕳
Start	Geräteliste	Konfiguration	Ansicht			۵ 🌏 🗴
Ansicht	Ansicht sper	ren Design	: ffice 2010 Blue	•	Sprache:	Info Info Info Info Info Info Info
Bildsc	hirmaufteilung	Gi.		Ar	Pe Deutsch (Deutschland)	Hife Hife

Fig. Set the language for the user interface

Various languages are available for the user interface.

 \geq Open the Language list and select a language

4.5 **General settings**

2	SHERLOG	×
Start Device lis	t Configuration View	a 🧒 🔒
E Log	∽ <u>√</u> <u>@</u>	
Settints	nge password User Manager	
- AS Show	w privileges	
 Active i 	user (dsude)	

Fig.: Configuration tab

4.5.1 Signal names and colours for display

🎭 General settings Service Workspace Phase scheme A Notifications Scheme: Deutsch Designe Deutsch Mase 1: United States Fignals B Preferences 도 User data Phase 2: 🖂 E-Mail 🕄 Log Phase 3: L3 Star point: 🔲 View N Screen L Earth: E 🚊 Data management ~ 🛅 Master data 눱 Data storage Data acquisition ~ Fig.: Set display profile for phase scheme

General settings for the configuration of the software can be made under Settings.

Call up the Configuration tab

The software contains a number of display profiles which can be selected via the phase scheme.

- Under View, open the Phase scheme \triangleright window
- \geq Open the Scheme list and select a display profile

The display profiles for German, English and American are already defined. Select User defined to define an individualized display profile.

First steps

Workspace	Phase scheme			
Notifications	Scheme: 📕 Deutsch 🔹			
Preferences	Designations Analog signals Binary signals			
User data	Default color:		14	
3 Childa	Signal	Color	-	
9 rog	Active power sum	-	=	
al lõeve	Reactive power sum			
1 404	Active factor			
Phase scheme	Aktive work sum	-		
Scree	Reactive work sum			
- rU	Apparent work sum			
Data management	Starpoint displacement voltage (tertiary)			
and the second second	Starpoint displacement voltage (secondary)			
gi master data	Starpoint displacement voltage (primary)			
🛓 Data storage	Starpoint displacement voltage			
	Starpoint displacement voltage (generator)			
uata acquisition	Phase related:	-		
Automatic requests	L1 L1-L2 N			
	L2 🖬 - L2-L3 🖬 - E		-	
	L3 🔲 - L3-L1 🔲 -			

Fig.: Set display profile for phase scheme

4.5.2 Define voltage levels

3	^	Master data		
Notifications		Voltage levels		
a notice a		XX		
Preferences			10 h 1 1	
📃 User data		NS	voitagelevel	
E-Mail		 Waveform: All 	1	
J Log		4	500 kV	
		4	420 k¥	
View	^	4	400 kV	
Obara advanta		4	380 kV	
Phase scheine		4	220 kV	
Screen layout		4	150 kV	
		4	110 kV	
j Data management	^	4	60 kV	
Master data		4	30 kV	
a storage		4	20 kV	
-N		4	15 kV	
Data acquisition	^	4	10 kV	
		4	6 kV	
Automatic requests		4	1 kV	
		4	0,4 kV	
		4	0,115 k¥	

Colours for analog and binary signals

As well as setting the signal names, it is also possible to set the colours for the display of analog and binary signals via the phase scheme.

In addition to the location, it is also possible to assign a voltage level to a SHERLOG device. For more information, see under **Set device name**, **location and connection parameters.**

The voltage levels must be defined beforehand:

- Under Data management, open the Master data window
- Add, delete or edit voltage levels with the aid of the tool bar

Fig.: Define voltage levels

4.5.3 Data storage

Sworkspace ^	Data storag	e
Notifications	Data folder:	C:\Dokumente und Einstellungen\All Users\Anwendungsdaten\KoCoS\Devic
Preferences		
🔝 User data		
🛁 E-Mail		
🗓 Log		
View ^		
🐛 Phase scheme		
Screen layout		
🔒 Data management 🔷 🔨		
🎒 Master data		
Data storage		
Data acquisiton ^		
👌 Automatic requests		

Fig.: Set storage location

The storage location for the SHERLOG database and all the measurement data can be specified here:

- Under Data management, open the Data storage window
- Click the button to open the Browse for folder dialogue box

Default data directory

Windows 7:

 $c:\ProgramData\KoCoS\DeviceController\Data$

Windows XP:

c:\Documents and settings\All Users\Applications data\KoCoS\DeviceController\Data



If the data directory is edited, a new empty database is automatically created. Existing measurement data are not transferred.

Show/hide the device list by clicking the

4.6 Register SHERLOG devices in the software

4.6.1 Device list

All SHERLOG devices are managed centrally in the device list which is also used for the configuration of automatic tasks for controlling data transfer and report creation, for example.

 \geq

≻

Call up the Start tab

Device list button



× 11 (* 1		-	in the second			-	-	~
Start	Device list	Configuration View				\$	-	2
Plant topology	Communication topology	Custom column value: IP address * Show last update	Add device	🗙 Delete	Automatic tasks			
	Viev	4	E	dit	Settings	General		

> Call up the **Device list** tab The **Device list** tab contains all the functions for customizing the view and integrating SHERLOG devices.

Fig.: Device list tab

4.6.2 Add devices to the device list

Start Device list Configuration View Image: Start Configuration View Image: Start <	Click the Add device button The wizard for the integration of new devices is started.
Add Device 23 Add Device 23 Is the device accesible through a communication connection? 24	The integration of devices which are already connected to the network by means of the Ethernet interface is described below by way of example:
The device is online The device is online The device and or rectary connected to your PC. All settings can be applied directly to the connected device. The device is offline	Further information on setting the IP address can be found in the SHERLOG CRX operating instructions.
next time, you connect to the device.	Click the The device is online button
Fig.: Wizard for the integration of new devices	
Add Device 23	A dialogue box for entering the IP address is called up.
Connect to device Plase enter the connection parameters to connect to the device. The device must be reachable to be able to add it to the network online. Connection type: TCP / IP •	If the address is unknown, it is possible to search for a device:
IP adress: 0.0.0.0 Port: 21520	Click the Search online for device button
Search online for device dick here to search the network for devices.	
Next > Cancel	

Add Device 23:	A list of all the devices in the network is displayed.
Searching for devices	
Device type Name IP address Integrated Sherby CRX Sherby CRX 192,168,2.90 Sherby CRX Sherby CRX 192,168,2.44 Sherby CRX Sherby CRX 192,168,2.45 Sherby CRX Sherby CRX 192,168,2.45 Sherby CRX Sherby CRX 192,168,2.45 Sherby CRX Sherby CRX 192,168,2.162	 Select a device in the list Only one device can be selected at a time
Sherlog CRX Sherlog CRX 192.168.2.84 Sherlog CRX Sherlog CRX 192.168.2.85 Sherlog CRX 192.169.2.85	
Device day use a precision of the second sec	Confirm with Next>
The device I am looking for is not listed here (Ic) here to enter the connection parameters may all.)	
cuck nere colencer une cuinteccur parametes ma usay.	
Next > Canol	
Add Device 33	The software introduces itself to the device and
S Add Device	integrates it into the current database.
The device is being added to the network	
Integrating the device into the network The device is being registered within the network.	
Downloading device configuration	
The device configuration is being downloaded from the device (ii) Storing the device in the asset database	
The device configuration is being saved to the asset database. This step is required build an asset stock and configure devices offline.	
 Unling the device to the topology The device is linked to the destination topology. 	
(ii) Refreshing network status The status of the network is being refreshed to reflect structure chanses.	
Next > Cancel	
Addresses 20	Once the device has been eveneefully added to
Add Device	the database, the Add device dialogue box is
The device has been added successfully.	displayed.
	Click the Finish button
→ Show online status	
Connect to device and show online status.	
Show device configuration Connect to device and show device configuration	The wizard for the integration of new devices is
	now available in the device list.
Add another device Restart the wizard from the begining	
Next > Frish	
SHERLOG	Click the Plant topology button
Start Device lict Configuration View	Devices are displayed along with their location
	Click the Communication topology
TP address	button
Plant Communication Show last undate Add c	Devices are displayed without the location
View	. ,
P-Device list	
Name IP-Adresse	
√ ∰ Korbach	
✓	
✓ 🎌 Büro PM	
🗏 Sherlog MJE 192,168.2,136 🥥 🗓	
Fig.: Device list with plant topology	
SHERLOG	The size of the window and the widths of the
Start Device list Configuration View	columns of the device list can be adjusted as
Skin: Language:	required. Click Save to save these settings which
Sa Sa Confice 2010 Blue	started.
Fig. : Save view	
riy Jave VIEW	

4.6.3 Activate automatic queries

In order for the software always to be able to display the current status of a device, the data can be requested automatically.

ີ່ (> Device list					ų.	×
Name						
🗸 🇰 Grid topo	ology					
🔤 Sherk	Ċ	Update device status			3 3	U, U,
	шO	Show values				
	67	Connection parameters	I 1			
		Automatic queries	8	Setting		
	Q	Device dialog	6	Suspen	λ	
	٢	Measurement setup	-		0	
		Add 🔸				
	×	Delete				
	_					

 Right-click a device in the device list
 In the context menu, click the item Automatic queries>Settings

Fig.: Device context menu

M	anage Scheduled Tasks	23
	Iransfer data Send reports Export data	
	Enable polling	
	Refresh device state	
	every 10 second(s)	
	Digital fault recorder #1 (DFR #1)	
	every 0 second(s)	
	Digital fault recorder #2 (DFR #2)	
	every 0 second(s)	
	Dynamic disturbance recorder (DDR)	
	every 0 second(s)	
	Edit polling interval	
	L	
	OK Can	cel
-		

A dialogue box is called up in which all the automatic tasks for the device can be set

> Activate the **Refresh device state** task

Click the Edit polling interval button and set the update interval to the required value Interval times between 5 and 30 seconds are recommended if there is a fast network connection between the PC and the device.

Fig.: Settings for automatic tasks

5 Define device parameters

5.1 Device dialog window

Sherlog CRX

1

Digital fault recorder *

Digital fault recorder

Unit DFR 1

Total records: 1 (0 downloaded)



Duration ~ 2,0 s

Download Analyse 🗙 Delete all 🛛 🌠 Test trigger 🔸

Right-click a device in the device list
 Click **Device dialog**

SHERLOG devices are configured in the Device

or:

Durat

1.15 c

Priorit

dialog window

Double-click a device in the device list

Initially, the device dialog window shows the table of contents of the fault recorder with all the records available in the device. In the case of devices which have not yet been configured it is usually empty.

Fig.: Device dialog window

Date 27.01.2000 01:11:46.744

5.2 Set device name, location and connection parameters



Fig.: Device dialog window for device settings

> Call up the **Settings** view

Under **General settings** it is possible to enter the device name and location and to edit the connection settings.

The device name and the location serve to identify the device in the device list and when opening records in the analysis software. The structure of the databank is organised in accordance with these settings. Changes can be made at any time and are automatically copied to the database as well.



Only those voltage levels which have already been defined are available for selection. For more information, see under **Define voltage levels**.

Under **Instrument functions** it is possible to edit the current device configuration or create a

The parameters saved in the device can be copied to the database of the PC to be used later.

The history in the parameters dialogue box displays the times of all the parameter changes in

the device for information purposes.

Define device parameters

5.3 Instrument functions

The instrument functions contain all the settings which are specific to the measurement locations, such as signal names, phase and power system allocations, recording settings, trigger criteria etc..

new configuration.

÷ Sherlog CRX					Sherlog CRX	0	۰
Settings . View	Apply G	ieneral ettings Sel	Instrument function	5. Time			
Settings							
In device:	11.02	.2013 0	8:49:10 by c	lsude	Edit New		
In device:	11.02	.2013 0	8:49:10 by c	lsude	Edit New		
In device: History:	11.02	1.2013 0	3:49:10 by c	lsude •	Edit New		
In device: History:	11.02	1.2013 0	8:49:10 by c	lsude -	Edit New		
In device: History:	11.02	1.2013 0	3:49:10 by o	dsude	Edit New		

Fig.: Device dialog window: Instrument functions

5.3.1 Create instrument functions

therbox CRY			sneno	g CRX		-	•	2
A REFERENCE TO A REFERENCE A								0
ettings Apply Ge	eneral Inst ttings	arument Tinctions	5. ime					
View	Setting	ş						
e ttings i device: 11.02.	2013 08:49	:10 by dsude	0	Edt	Net			
story:			· Euro	-4	NS			
							G)
Davice	Analog input	5					G)
Device ^	Analog input	s Ranga 🤅	Component	Sgni	Sensor	Rabio	G) al re
Device ^	Analog input	s Range 300 VAC	Component	Sgnall Analog Input #01	Sensor 	Rabio 0,10 kV/s00 V	G Teb	1
Device ^ énsion tracés Binary inpués Binary outures	Analog input	s Range 300 VAC 300 VAC	Component	Signali Analog Ipod. #01 Analog Ipod. #02	Sensor ini canono ini canono ini canono	Patio 0,10 Ky/100 V 0,10 Ky/100 V	G Tet)
Device ^ Anabourouts Bravy ropus Bravy oguits	Analog input	Se Range So VAC So So So VAC So So So VAC So	Component Z Z	Sgruli Anslig input #01 Anslig input #02 Anslig input #02	Sensor challes in challes in challes in challes in	Platio 0,10 kV(10 V 0,10 kV(10 V 0,10 kV(10 V 0,10 kV(10 V 0 0 kV(10 V	G Teb	3
Device ^ devicerotes Brays rodas Brays rodas Brays adjusts Excisical environment ^	Analog input	S Range 3 300 WAC 3 300 WAC 3 300 WAC 3 300 WAC 5	Component 7	Signal Ansing Insuk #01 Ansing Insuk #02 Ansing Insuk #00 Ansing Insuk #04 Ansing Insuk #04	Sensor charata y in charata y i	Rabo 0,103/100/000/ 0,100/100/000/000/000/000/000/000/000/00	Tob 3 3 3	al re 100 100
Doka A daskorodz Bray rodz Bray rodz Bray odzał Bray odzał Goren d	Analog input	S Range 300 VAC 300 VAC	Component 7 2 2 2 2	Signal Analog neuk #01 Analog neuk #02 Analog neuk #00 Analog neuk #06 Analog neuk #06	Sensor croses :	Baloo 0,10 kV/200 V 0,10 kV/200 V 0,10 kV/200 V 0,10 kV/200 V 0,10 kV/200 V 0,10 kV/200 V 0,10 kV/200 V 0,10 kV/200 V	() Tob. 3 3 3 3 3 3 3 0 0 0	3 100 100 200 200
Deska ^ ^ Arakaroza Brays poda Brays ofdats Deskrad environment ^ Graneral _	Analog input	8 Range (300 WAC 5 300 WAC 5 300 WAC 5 0,00 WAC 5 0,20 WAC 5	Corponent Z	Spril Andra proc. 401 Andra proc. 402 Andra proc. 402 Andra proc. 403 Andra proc. 405 Andra proc. 405 Andra proc. 405	Sensor choles > 10 choles > 10	0.,10 ky/c00 0.,10 ky/c00 0.,10 ky/c00 0.,0 ky/c00 0.,10 ky/c00 0.,10 ky/c00 0.,10 ky/c00 0.,10 ky/c00 0.,10 ky/c00 0.,0 ky/c00	Tob. 3 3 3 0 0 0	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Device	Analog input 0 001 0 002 0 004 0 004 0 005 0 005 00	S Range Q 200 WAC S 300 WAC S 300 WAC S 300 WAC S 300 WAC S 0,20 W	Component 7 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	Signal Analog pool 400 Analog pool 400 Analog pool 400 Analog pool 400 Analog pool 400 Analog pool 400 Analog pool 400	Server Onore 3: Onore 3:	Babio Babio 0,10 My/100 V 1 0,10 My/100 V	Teb. 3 3 3 0 0 0 0 0 0	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Desks Acobs prog Browy rodus Desksia Browy rodus Des	Anatog input	s Range Q 300 WAC 3 300 WAC 3 300 WAC 3 0,20 WAC 3 0,20 WAC 3 0,20 WAC 3 0,20 WAC 3	Component Z Z Z Z Z Z Z Z Z	Signal Analag sport Att Analag sport Att	Sensor chalab in chalab in chalab in chalab in chalab in chalab in chalab in chalab in chalab in	Baloo 0.10 kV/20 V	Teb. 3 3 0 0 0 0 0	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Device Antoine Device Antoine Device Devi	Analog input	S Range 3 300 WAC 3 300 WAC 3 300 WAC 3 300 WAC 3 300 WAC 3 0,20 WAC 3 0,20 WAC 3 0,20 WAC 3 0,20 WAC 3 200 AAC 3	Component Z Z Z Z Z Z Z Z Z Z Z Z Z Z	5914 7406 ppt 470 7406 ppt 470	Sensor Ganares Ganares Ganares Ganares Ganares Ganares Ganares Ganares Ganares Ganares	Ratio 0,10 kV/00 V 1,40 kV/00 V 1,41 k	G Tob. 3 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Device	Analog input	S Ramping 300 WAC 300 WAC	Corponent Z	Signal Analag speak Atta Analag speak Atta	Senarce Chanala - III Chanala - III	Button 0.,10 kyt00 v 1.4 k/4 k 1.4 k/4 k	Teb. 3 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Device	Analog input	S Range Q 300 WAC 5 300 WAC 5 300 WAC 5 300 WAC 6 300 WAC 6 0,20 WAC 5 0,20 WAC 5 0,20 WAC 5 200 AAC 6 200 AAC 5	Component 7 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	59ml Anaig port A13 Anaig port A12 Anaig port A12 Anaig port A12 Anaig port A13 Anaig port A14 Anaig port A14 Anaig port A11 Anaig port A112	> المسعل	8 Jaho 0.,10 Jayte0 (*) 1.4 Ja Ja 1.4 Ja Ja 1.4 Ja Ja 1.4 Ja Ja	C C C C C C C C C C C C C C C C C C C	1 ra 100 100 100 100 100 100 100 10
Donka A Sabaka mada Sabaka mada Bakrara gala Donyr odaybak Sabara Andrew A Daglaf fait Recorder Donerei detuberce recu	Analog input	S Range (300 WAC 5 300 WAC 5 300 WAC 5 0,20 WAC 5 0,20 WAC 5 0,20 WAC 5 0,20 WAC 5 0,20 WAC 5 0,20 WAC 5 200 AAC 5 200 A	Component Z	Sport Anning sport ATO Anning sport ATO	50000 100005-	Button 0., 10 My/200 V 1.,	G Tobb 3 3 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 4 ra 500 500 500 500 500 500 500 50
Device	Analog input 0 601 0 602 0 603 0 604 0 605 0 607 0 609 1 609 1 601 1 601 1 601 1 601 1 601 1 601 1 601	S Range 2 300 MaC 5 300 MaC 5 300 MaC 5 300 MaC 5 300 MaC 6 300 MaC 6 300 MaC 6 200 AAC 5 200 AAC 5 200 AAC 5 200 AAC 5	Corporent 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	59ml Andia good AT Andia good AT	Sensor 20003 - 1 20003 - 1 20005 - 1	Balloi Balloi 0.38 brigons y =- - 1.434 h =- - 1.434 h =- - 1.434 h =- - 1.434 h =- -	C Teb Teb 0 0 0 0 0 0 0 0 0 0 0 0 0	al ra 300 300 300 300 300 300 300 30
Donket A Constant Con	Anabog input 0 001 0 002 0 003 0 004 0 005 0 006 0 006 0 006 1 009 1 009 1 011 1 012 1 013 1 015	S Rampe (200 WAC = 300 WAC = 300 WAC = 300 WAC = 0,20 WAC = 0,20 WAC = 200 AAC = 200 AAC = 200 AAC = 200 AAC = 200 AAC = 200 AAC =	Component Z	Spol Aneig spol A10 Aneig spol A11 Aneig spol A11 Aneig spol A11 Aneig spol A11 Aneig spol A115	Senor 40066- 40066- 40066- 40066- 40066- 40066- 40060- 4000- 400-	Patto Patto 0.310 M/GM	C Tete Tete 3 3 3 3 3 3 3 3 3 3 3 3 3	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

Fig.: Instrument functions with automatically assigned default channel names

Click the New button

A set of instrument functions is created for the appropriate device and opened.

The set of instrument functions already contains all the settings which correspond to the equipment of the device, including the number of analog and binary inputs and outputs and the measuring ranges.

Default names are assigned to all the channels (e.g. analog input #001).

5.3.2 Analog inputs

	#	Range	0	Component	Signal		Ser	nsor	Ratio	Total range
D	001	300 VAC	V		Analog input #01		<none></none>		0,10 kV/100 V …	300 VAC
				_	# (U) 001	Information box for channel type (voltage or current) and for the physical channel number.				age or number.
					Range 300 VAC	Maximum measuring range of the channel at the input terminal of the device				
					?	Check Chanr	k box for s nels which	wit are	ching the channel o e switched off are n	n and off. ot recorded.
		Component		Signal		Signa	l group an	d s	ignal name for clea	r
				Analog input #	¢01	laenti	fication.			
					Sensor	Trans transo	mission pa ducer (e.g.	araı te	meters of a measur mperature to voltag	ing ge).
				110/√3 kV/1	Verhältnis 00/√3 V ····	Trans transf	formation formers (C	rat T /	io of current and vo VT).	oltage
					Total range 330 kVAC	Inforr meas meas consid	mation box uring rang uring rang deration th	e wi e w e o ie s	ith the maximum pr which results from the f the channel taking sensor and transform	rimary ne g into mer ratios.

Example of configuration for an external current clamp

A current clamp with a transformation ratio of 100 A / 0.1 A is to be connected to a 200 mV input via a 2 Ohm shunt.

📼 Gerðt 🔷	Anal	oge Ei	ngänge								
Kki Analoge Engange		*	Bereich	9	Komponente	Signal	Sensor	Verhä	ltnis	Total range	*
12M. Rináre Eingánge	U	001	300 VAC	7		Analogeingang #01	<kein> ···</kein>	0,10 kV/100 V		300 VAC	
Die Bieles Aurahone	U	002	300 VAC	1		Analogeingang #02	<kein> ···</kein>	0,10 kV/100 V		300 VAC	
Las cenare recegarge	U	003	300 VAC	\mathbf{V}		Analogeingang #03	<ken> ···</ken>	0,10 kV/100 V		300 VAC	
향 Elektrische Umgebung ^	U	004	300 VAC	$ \mathbf{v} $		Analogeingang #04	<ien> ···</ien>	0,10 kV/100 V		300 VAC	
Algemen	U	005	0,20 VAC	1		Analogeingang #05	<kein> ···</kein>	0,10 kV/100 V		0,20 VAC	
C calendar	U	005	0,20 VAC	7		Analogeingang #06	<ien></ien>	0,10 kV/100 V		0,20 VAC	
🐮 Funktionen 🗠	0	007	0,20 VAC	V		Analogeingang #07	<kein> ···</kein>	0,10 kV/100 V		0,20 VAC	=
😽 Digitaler Störschreiber	U	008	0,20 VAC	V		Analogaingang #08	<ien> N</ien>	0,10 ky/100 v		0,20 VAC	
A RMS Storschreiber	1	009	10 AAC	V		Analogeingang #09	<ken></ken>	1 A/1 A		10 AAC	
-	1	010	200 AAC	V		Analogeingang #10	<kein> ····</kein>	1 A/1 A		200 AAC	

Enter sensor settings:

Edit sensor					23
Type:	Measuremen	t Transducer		-	
Measured quantity:	Strom			-	
	from	to			
Range:	-100,00	100,00	Α	-	
Output:	-0,10	0,10	Α	-	
V Output	t resistor	2,00	Ω	-	
		·			

> Click the 🔤 button in the **Sensor** column

The Edit sensor dialogue box is called up
 Enter sensor settings and confirm with OK
 The settings are copied to the analog channel parameters.

Analog channel parameters:

	#	Bereich	9	Kompone	Signal	Sensor	Verhältn	nis Total range
U	008	0,20 VAC	V		Analogeingang #08	±100 A/±0,10 A 2,00 Ω ···	<kein> ··</kein>	·· 100 AAC

The current clamp is to be connected to the secondary side of an upstream primary current transformer with a transmission ratio of 400 A/1 A.

A	nalo	ge Ei	ngänge								
		0	Bereich	9	Komponente	Signal	Sen	sor	Verhältr	nis	Total range
Г	U	006	0,20 VAC	7		Analogeingang	<kein></kein>		0,10 kV/100 V		0,20 VAC
	U	007	0,20 VAC	V		Analogeingang	<kein></kein>		0,10 kV/100 V		0,20 VAC
	U	008	0,20 VAC	×		Analogeingang	±100 A/±0,10 A 2,00 mQ		diein> -	ТN	100 kAAC
		009	10 AAC	1		Analogeingang	<kein></kein>		1 A/1 A	h	10 AAC
	1	010	200 AAC	1		Analogeingang	<kein></kein>		1 A/1 A		200 AAC

Enter transformer settings:

Edit ratio		53
Туре:	Stromwandler	Ŧ
Measured quantity:	Strom	-
P P	rimär: 400,0	0 A 🔻
	ekundär: 1,0	0 A 🔻
	ОК	Cancel

In addition to the sensor parameters, the transmission ratio of the transformer must be specified here:

- Click the button in the Ratio column
- > The Edit ratio dialogue box is called up
- Select the transformer type

The transformer ratio is displayed

 Enter the transformer ratio and confirm with **OK**

The settings are copied to the analog channel parameters.

Analogue channel parameters:

		#	Bereich	9	Kompone	Signal	Sensor	Verhältnis	Total range
Î	U	008	0,20 VAC	V		Analogeingang #08	±100 A/±0,10 A 2,00 Ω ···	400 A/1 A ···	40 kaac



It is not possible to configure power systems or phase references such as lines or bus bars in the analog channel parameters. These are defined under **Electrical environment**, see below for more information. The transformation ratios of primary current and voltage transformers are entered there too.

5.3.3 **Power systems**

ill Geröt A	Anal	nge Eingär	inge					
14 Analoge Emplenes		2	Bereich	💡 Kompor	iente Signal	Sensor	Verhältnis	Total ran
1 Doire Enginge	U	001	300 VAC	V	Analogeingang #01	den>	0,10 ky/100 V	300 \
Dinice Involtore	U	002	300 VAC	1	Analogeingang #02	dain>	0,10 kv/100 v	300
e ona chargenge	U	003	300 VAC	4	Analogeingang #03	den> ···	0,10 kV/100 V	300
Elektrische Uregebung 🔷 🔨	U	004	300 VAC	4	Analogeingang #04	den> ···	0,10 ky/100 V	300
Algemein	U	005 0	0,20 VAC	V	Analogeingang #05	ckein> ···	0,10 kv/100 v	0,20
1 Ar	U	006 0	0,20 VAC	4	Analogeingang #06	deho	0,10 kV/100 V	0,20
S Funktionen ^		007 0	0,20 VAC	2	Analogeingang #07	dan> …	0,10 ky/100 V	0,20
Digtaler Störschreiber	0	005 0	0,20 VAC	7	Analogeingang #08	±100 A/±0,10 A 2,00 Q ···	400 A/1 A	403
RMS Störschreiber	1	009	10 AAC	V	Analogeingang #09	den> ···	1 A/1 A	10
	1	010 3	200 AAC	1	Analogeingang #10	diein> ···	1 A/1 A	200
	1	011 :	200 AAC	7	Analogeingang #11	dain> ···	1 A[] A	200
	1	012 3	200 AAC	1	Analogeingang #12	dieino …	1 A/1 A	200
Gerat				^	Allgemein			
🖂 Gerat	Eingä	änge		^	Allgemein Nennwerte			
Gerac d Analoge E d Binäre Eir D Binäre Au	Eingä ngän usgäl	änge ige nge		~	Allgemein Nennwerte Systemfrequ	ienz: 50 Hz	. •	
Gerat	Eingä ngän usgäi + Um	änge ige nge gebu	Ing	^	Allgemein Nennwerte Systemfrequ	ienz: 50 Hz	•	
Gerat Gerat Analoge B J Binäre Eir D Binäre Au	Eingän Isgän 9 Um	änge ige nge gebu	Ing	^	Allgemein Nennwerte Systemfrequ Topologie Samr	ienz: 50 Hz nelschiene hinzuf	ügen	
Gerat	Eingä ngän usgäi e Um	änge Ige nge gebu	Ing	^	Allgemein Nennwerte Systemfrequ Topologie Samr Leit	ienz: 50 Hz melschiene hinzuf	: ▼ Ügen	
Gerat III Gerat III Binäre Eir III Binäre Au III Binäre Au I	Eingän ngän usgäl 9 1	änge ige nge gebu	ing	^	Allgemein Nennwerte Systemfrequ Topologie ** Samr T Leit	ienz: 50 Hz nelschiene hinzuf	ügen gen	
Gerat Image I	Eingän ngän usgäi : : : : :	änge ge gebu	ing	^	Allgemein Nennwerte Systemfrequ Topologie Samr Leit	nelschiene hinzufü	ügen gen	
Gerat G	Eingän ngän usgäi e Um L	änge ge gebu	ing	^	Allgemein Nennwerte Systemfrequ Topologie	nelschiene hinzuf	ûgen gen	

Phase references and/or power systems such as lines or bus bars can be defined and configured under **Electrical environment**.

- Call up the General view
- Set the rated frequency of the system
- Add bus bars and lines as described below

Add bus

Bus bars are also to be understood as a synonym for any power systems which contain only voltages. This means that they can also be used for voltage groups of generators or transformers, for example.

Add line

Lines are power systems which can contain both currents and voltages.

If both voltages and currents are assigned to a line, this power system is self-contained. However, if only currents are assigned to a line, then it can be coupled to a bus bar created previously. Several lines can be connected to one bus bar in this way. This means that SHERLOG is capable of carrying out power or fault location calculations on several lines, for example, although the corresponding voltages (bus bar) are only measured once. See the example of configuration below.

Example of configuration for power systems

A parameterization is to be created for a 110 kV bus bar and 2 outgoing lines with the following configuration:

110 kV bus bar with 3-phase voltage transformer with open delta winding for measuring the displacement voltage is to be connected to analog inputs 1 to 4. The transformation ratio of the transformer is 110 kV / 100 V

Line 1: 3-phase current measurement on a current transformer with a transformation ratio of 400 A / 5 A which is to be connected to SHERLOG high-current inputs 9, 10 and 11 with a measuring range up to 200(200 A). The line is to be coupled to the 110 kV bus bar.

Line 2: 3-phase current measurement with star point current on a current transformer with a transformation ratio of 800 A / 1 A which is to be connected to 200 mV SHERLOG inputs 5, 6, 7 and 8 via an external AC/DC current sensor with 5 mOhm shunt. Line 2 is also to be coupled to the 110 kV bus bar.

Create power systems

CIB Device ^	Anal	ag inpul	3						
Analog Inputs		2	Range	8	Component	Signal	Sensor	Ratio	Total range
2014 Binery inputs	U	001	300 VAC	1		Analog input #01	knone>	0,10 ky/100 v …	300 VAC
Dib Beary outruits	U	200	300 VAC	V		Analog input #02	<none></none>	0,10 ky/100 v …	300 WAC
	U	003	300 VAC	1		Analog input #03	<none></none>	0,10 kv/100 v	300 VAC
弱 Electrical environment ^	U	004	300 VAC	V		Analog input #04	shone>	0,10 ky/100 v	300 VAC
120 General	U	005	0,20 VAC	V		Analog input #05	anone>	0,10 ky/100 v …	0,20 VAC
	U	005	0,20 VAC	4		Analog input #06	<none></none>	0,10 ky/100 v	0,20 VAC
BC Function ^	U	007	0,20 VAC	V		Analog input #07	shone>	0,10 ky/100 v	0,20 VAC
A Digital Fault recorder	U	003	0,20 VAC	V		Analog input #08	±100 A(±0,10 A 2,00 Ω ···	400 A/1 A ···	40 8440
Dynamic disturbance reco	1	009	200 AAC	¥		Analog input #09	knone>	1 A/1 A	200 AAC
	1	010	200 AAC	1		Analog input #10	<none></none>	1 A/1 A	200 AAC

- Device	General
	General parameters
Analog inputs	System frequency: 50 Hz 👻
☑ ● Binary inputs	
Binary outputs	
	Topology
🙀 Electrical environment	Add bus
🔽 General	T Add line
🎌 New Bus 2	5
🎲 New Line 2	×//
[↑] <u>New Line 3</u>	3

- Call up the General view
- Add power systems (one new bus bar and two new lines)

Define bus bar parameters

	1	۳
III Device ^	New Bus 2	
Analog inputs	Propterties	
24 Binary inputs	ID: New Bus 2 Type: 3-phase/3-wire 💌	
D Binary outputs	Description: Sammelschiene 110kV	
Electrical environment	Scheme Signals	
7 General	Diagram Bus	
9 New Bus 2 83	Oph: 0.10 kV/100 V Voltage level:	
T New Line 2	Rated voltage: 0,0000 V	
New Line 3	Measurement transducers	
Functions	✓ Bus voltage	
Digital fault recorder Dynamic disturbance reco		
	OK Can	ncel

Fig.: Bus bar parameters

Instrum	ent transform	er: Bus bar	voltage				23
	Р	Primary			110,00 kV	▼ × 1/√	3 🔻
C	5	Secondar	У		100,00 V	▼ ×1/√	3 🔻
		Open del	ta		110,00 kV	▼ × 1/√	3 -
	5	Connectio	n	Three	e-phase L-N	-	
C	alculate displa	icement vo	ltage				
Bus 1	10 kV.UL1-N ł	ous:	1: 300 VAC 330) kvac			-
Bus 1	10 kV.UL2-N ł	ous:	2: 300 VAC 330) kvac			-
Bus 1	10 kV.UL3-N t	ous:	3: 300 VAC 330) kvac	:		-
Extra	signal		4: 300 VAC 330) kvac	:		-
					ОК	Cano	el

Fig.: Instrument transformer configuration with measurement channel allocation

- Click the **New Bus 1** bus bar to open the properties window
- Enter an ID and, if required, a description for the bus bar
- Click the transformer box to open instrument transformer configuration and measurement channel allocation
- Configure the transformer ratio and measurement channel allocation
- Confirm with **OK**



Define parameters for line 1 (direct current measurement)

Define parameters for line 2 (current measurement via external sensor)

For line 2, current measurement is to be carried out using an external sensor which converts the current signal to a voltage signal. For this reason it has to be connected to a voltage input of the SHERLOG device. First the sensor must be defined in the analog channel parameters.

When the analog channel parameters are opened, it can be seen that the power systems defined so far have been automatically updated.

Device	Analo	og inputs	•							
24 Analog inputs		#	Range	8	Component	Signal	Sen	sor	Ratio	Total rang
Rinary inputs	U	001	300 VAC	V	Bus 110 kV	Bus voltage L1-N	<none></none>		110/√3 kV/100/√3 V 🕋	330 kVA
Bipary outputs	U	002	300 VAC	1	Bus 110 kV	Bus voltage L2-N	<none></none>		110/√3 kV/100/√3 V 🕋	330 kVA
Billy bindry outputs	U	003	300 VAC	1	Bus 110 kV	Bus voltage L3-N	<none></none>		110/√3 kV/100/√3 V 🕋	330 kVA
🙀 Electrical environment 🛛 🔺	U	004	300 VAC	V	Bus 110kV	Analog input #04	<none></none>		110/√3 kV/100/√3 V ····	330 kVA
71 General	U	005	0,20 VAC	V		Analog input #05	<none></none>		0,10 kV/100 V 😶	0,20 VA
99 Bus 110 kV	U	006	0,20 VAC	V		Analog input #06	<none></none>		0,10 kV/100 V …	0,20 VA
New Line 1	U	007	0,20 VAC	V		Analog input #07	<none></none>		0,10 kV/100 V	0,20 VA
Now Line 2	U	008	0,20 VAC	1		Analog input #08	<none></none>		0,10 kV/100 V	0,20 VA
1 New Line 2	1	009	200 AAC	1	New Line 1	Line current L1	<none></none>		400 A/5 A 🕋	16 kAA
😽 Functions 🔷		010	200 AAC	1	New Line 1	Line current L2	<none></none>		400 A/5 A 🕋	16 kAAd
		011	200 AAC	1	New Line 1	Line current L3	<none></none>		400 A/5 A 🕋	16 kAA
	1	012	200 AAC	1		Analog input #12	<none></none>		1 A/1 A	200 AA
M Dynamic distarbance recom		013	200 AAC	V		Analog input #13	<none></none>		1 A/1 A …	200 AA
		014	200 AAC	V		Analog input #14	<none></none>		1 A/1 A …	200 AA
		015	200 AAC	V		Analog input #15	<none></none>		1 A/1 A …	200 AA
	1	016	200 AAC	V		Analog input #16	<none></none>		1 A/1 A	200 AA

Fig.: Analog channel parameters with automatically assigned signal names

Define parameters for an external AC/DC current sensor with 5 mOhm shunts

Las Device	ADDR	og input	5							
D1 Analog inputs		2	Range	9	Component	Signal		Sensor	Ratio	Total range
Dinary inputs	U	001	300 VAC	V	Bus 110 k9	Bus voltage	e L1-N	<none> ····</none>	110/V3 kv/100/V3 V 🛗	330 kvAC
	U	002	300 VAC	¥	Bus 110 kV	Bus voltage	Bus voltage L2-N		110/√3 kv/100/√3 v 🚳	330 kvAC
	U	003	300 VAC	4	Bus 110 k9	Bus voltage	e L3-N	<none> ····</none>	110(v/3 kv/100/v/3 v 📸	330 KNAC
10 Electrical environment	U	009	300 YAC	V	Bus 110ky	Analog Inpi	ut #04	<none></none>	110/V3 kv/100/V3 v	330 kvAC
ZI General	U	005	0,20 VAC	V		Analog inpr	ut #05	<none></none>	0,10 kV/100 V	0,20 VAC
P BIS 110 KY	U	006	0,20 VAC	¥		Analog in	C.D		L	0,20 VA0
T New Line 1	U	007	0,20 VAC	×		Analog in		- 1		0,20 VA0
* New Line 2	U	008	0,20 VAC	V		Analog in	Type:	Shunt	*	0,20 VA
		009	200 AAC	¥	New Line 1	Line curve	Measured quantity:	Gurrent	A -	16 KAAC
🐉 Punctions 🔷	1	010	200 AAC	¥	New Line 1	Line curre				16 kAA0
A Diatal fack recorder	1	011	200 AAC	X	New Line 1	Line curre		Shunk resistance	5,00 mΩ 💌	16 kAA0
Dynamic disturbance raco	1	012	200 AAC	<i>¥</i>		Analog in				200 AA0
		013	200 AAC	4		Analog in				200 AAA
	1	014	200 AAC	V		Analog in				200 AA
	1	015	200 AAC	X		Analog in				200 AAO
		016	200 AAC	4		Analog in			and the second second	200 AAA
									OK Cencel	Cancel

 Open the sensor parameters by clicking the sensor column of the analog channel required

Enter the sensor type and resistance

Once the sensor configuration for analog inputs 5 to 8 has been completed successfully, the measuring range in the **Total range** column has changed to 40 A. These inputs are now available as current inputs and can be assigned in the signal allocation of the **Line 2** power system.

Device ^	Anale	og input	s								
Analog inputs		#	Range	0	Component	Signal	Sen	sor	F	atio	Total range
Binary inputs	U	001	300 VAC	1	Bus 110 kV	Bus voltage L1-N	<none></none>		110/√3 kV/100/√3 V	a	330 kvac
Bipary outputs	U	002	300 VAC	1	Bus 110 kV	Bus voltage L2-N	<none></none>		110/√3 kV/100/√3 V		330 kVAC
Edy bindry outputs	U	003	300 VAC	~	Bus 110 kV	Bus voltage L3-N	<none></none>		110/√3 kV/100/√3 V	8	330 kVAC
🙀 Electrical environment 🔷	U	004	300 VAC	1	Bus 110kV	Analog input #04	<none></none>		110/√3 kV/100/√3 V		330 kVAC
Z General	U	005	0,20 VAC	1		Analog input #05	5,00 mΩ		<none></none>		40 AAC
99 Bus 110 kV	U	006	0,20 VAC	1		Analog input #06	5,00 mΩ		<none></none>		40 AAC
Them Line 1	U	007	0,20 VAC	V		Analog input #07	5,00 mΩ		<none></none>		40 AAC
 New Line 2 	U	008	0,20 VAC	V		Analog input #08	5,00 mΩ		<none></none>		40 AAC
		009	200 AAC	V	New Line 1	Line current L1	<none></none>		400 A/5 A	2	16 kaac
Structions	1	010	200 AAC	1	New Line 1	Line current L2	<none></none>		400 A/5 A	8	16 kaac
A Digital Fault recorder	1	011	200 AAC	1	New Line 1	Line current L3	<none></none>		400 A/5 A	2	16 kaac
Dynamic disturbance reco		012	200 AAC	1		Analog input #12	<none></none>		1 A/1 A		200 AAC
		013	200 AAC	1		Analog input #13	<none></none>		1 A/1 A		200 AAC
	1	014	200 AAC	1		Analog input #14	<none></none>		1 A/1 A		200 AAC
	1	015	200 AAC	V		Analog input #15	<none></none>		1 A/1 A		200 AAC
		016	200 AAC	1		Analog input #16	<none></none>		1 A/1 A		200 AAC



≻ Click the New Line 2 entry to open the properties window of the power system

Fig.: Measurement channel allocation of the sensor inputs

Leitung 2												
Propterties												
ID: Leitung 2	Bus:	Sammelschiene	= 110kV -									
Description: Beliebiger Text	Type:	3-phase/4-win	e (*									
Scheme Signals Line Fault analysis												
Dayrem * <th>PL VC R</th> <th>s altage level: ated voltage: assurement 2 Bus voltage 2 Line current 7 Sum current</th> <th>Instrument bandomen i</th> <th>Line current sum Primary 20 Secondary Connection One-phil B: 0,20 VAC 40 AAC OK</th> <th>23 0,00 A * 1,00 A * 00 A * 00 A * 00</th>	PL VC R	s altage level: ated voltage: assurement 2 Bus voltage 2 Line current 7 Sum current	Instrument bandomen i	Line current sum Primary 20 Secondary Connection One-phil B: 0,20 VAC 40 AAC OK	23 0,00 A * 1,00 A * 00 A * 00							

Configure the line ≻

Fig.	Configuration	of the	summation	current	transformer	for	line	ź

This completes the configuration. The names and measuring ranges of the analog channel parameters concerned are added automatically:

Analo	og inputs	5								
	#	Range	9	Component	Signal	Senso	or	Ra	atio	Total range
U	001	300 VAC	1	Bus 110 kV	Bus voltage L1-N	<none> ···</none>		110/√3 kV/100/√3 V		330 kVAC
U	002	300 VAC	V	Bus 110 kV	Bus voltage L2-N	<none> ··</none>	-	110/√3 kV/100/√3 V	2	330 kVAC
U	003	300 VAC	V	Bus 110 kV	Bus voltage L3-N	<none> ··</none>		110/√3 kV/100/√3 V	8	330 kVAC
U	004	300 VAC	V	Bus 110kV	Analog input #04	<none> ··</none>	4	110/√3 kV/100/√3 V		330 kVAC
U	005	0,20 VAC	V		Analog input #05	5,00 mΩ ··		<none></none>		40 AAC
U	006	0,20 VAC	V		Analog input #06	5,00 mΩ ••		<none></none>		40 AAC
U	007	0,20 VAC	1		Analog input #07	5,00 mΩ ··		<none></none>		40 AAC
U	008	0,20 VAC	V	New Line 2	Earth current	5,00 mΩ ··		200 A/1 A	4	8 kaac
(Î)	009	200 AAC	1	New Line 1	Line current L1	<none> ··</none>		400 A/5 A		16 kAAC
1	010	200 AAC	V	New Line 1	Line current L2	<none> ··</none>		400 A/5 A	-	16 kaac
(1)	011	200 AAC	1	New Line 1	Line current L3	<none> ··</none>		400 A/5 A		16 kaac
	012	200 AAC	V		Analog input #12	<none> ··</none>	4	1 A/1 A		200 AAC
	013	200 AAC	V		Analog input #13	<none> ···</none>		1 A/1 A		200 AAC
1	014	200 AAC	V		Analog input #14	<none> ··</none>		1 A/1 A		200 AAC
1	015	200 AAC	1		Analog input #15	<none></none>		1 A/1 A		200 AAC
(I)	016	200 AAC	1		Analog input #16	<none> ···</none>		1 A/1 A		200 AAC

The signal names were entered automatically by the software in accordance with the configuration of the electrical environment and can be edited manually as required.

5.3.4 Binary inputs

Initially configuration of the binary inputs is limited to entering the desired names. All binary inputs are recorded automatically and are available in every record.

Sherlog CRX					۰	23
Device ^	Binar	y inp	uts			
☑ Analog inputs		#	Component	Signal		
Did Binary inputs	 :	001	Primary protection	Overcurrent tripping		
Binar Puts	 ;	002		Binary input #02		
- With With the second	 ;	003		Binary input #03		
🔅 Electrical environment 🔷 🔺	 ;	004		Binary input #04		
🔽 General	л;	005		Binary input #05		=
Y New Bus 1	 ;	006		Binary input #06		
1 New Line 1	 ;	007		Binary input #07		
New Line 2	л°	008		Binary input #08		
	_ ;	009		Binary input #09		
Structions	л°	010		Binary input #10		
AZ Digital fault recorder	 ;	011		Binary input #11		
AZ Dynamic disturbance reco	_	012		Binary input #12		
	л°	013		Binary input #13		_
						_
				ОК С	ancel	

Fig.: Entry of names for binary inputs

5.3.5 Binary outputs

Fixed functions only can be allocated to the binary inputs using the picklist in the **Signal** column:

					▣	23
Device ^	Binar	y out	puts			
☑ Analog inputs		#	Component	Signal		
☑ Binary inputs	18	001		Recorder activated		
Binary outputs	18	002		Memory full		
	18	003		System error		
🙀 Electrical environment 🔥 🔺	1	004		<none></none>		Ţ
🔽 General	N°	005		<none></none>		
	18	006		<none></none>		
Structions	18	007		<none></none>		
🍕 Digital fault recorder	18	008		<none></none>		
of Dynamic disturbance reco	18	009		<none></none>		
	18	010		<none></none>		
				ОК Са	ancel	

Fig.: Function allocation for binary outputs

5.3.6 Define digital fault recorder parameters

The digital fault recorder makes high-resolution recordings of power system faults.

The transient fault record generally contains all the signals which are connected to the analog and binary inputs and shows the fault characteristic with additional pre-fault and post-fault periods.

The time resolution of the analog inputs can be set between 100 Hz and 30 kHz. Binary inputs are always recorded with 10 kHz and therefore have a fixed time resolution of 100 microseconds (0.1 ms).

Line 1 UL1-N Gen	250 -		
Line 1 UL2-N	250 -	******	
Line 1 UL3-N	250 -	WWWWWWWWWWWW	
Line 1 1 Il 1	450 -450	NMMM/	
Line 1 11.2	450 -450		
Line 1 • IL3	450	*	
Line 1 E	450	*	
Default Reserved	120		
Relay ON L1 Relay ON L2 Relay ON E Feeder B ON CB Open L1 CB Open L2 CB Close			
CB Trip command CB Trip Comman CB Trip Comman Reclosure comma	1 L1 5 L2 5 L3 and 1	100.00 100.00 200.00 300.00	بر/مع 405.00 غورارون غورارون 405.00 غورارون

Fig.: Example of a record

SHERLOG contains two discrete digital fault recorder units.

Sampling rate, recording duration and trigger conditions can be assigned to each unit separately. Both units can also generate simultaneous or overlapping recordings.

Sampling rate and recording duration

Device A	Digital fault records				
Las Device	Digital fault record				
🖾 Analog inputs	Recording settings	Trigger			
🔣 Binary inputs			Unit 1	Unit 2	
Binary outputs	Sample rate:		2.000 Hz 🔻	5.000 Hz 👻	
	Pre-fault				
詩 Electrical environment ^	Duration:		500 ms	200 ms	1
Z General	F				
	Recording mode:	Sh	tic 🔻	Dynamic	1
55 Functions	Marchanna de antines	-	0500	571 and	
A Digital fault recorder	Maximum duration:		2500 ms	SUUU ms	
	Post-fault	_			
bynamic usturbance reco	Duration:		500 ms	100 ms	
	External trigger				
	Enabled:				
	Accepted trigger ids:		-	1 -	1
	Darah Gaudh				
	Post-rault				
				-	
	Max. recording time:				
	Priority:		1	1	
					<i>c</i>
				OK	Cano

- Call up the Digital fault recorder view Þ
- Make the settings on the Recording settings tab

Sample rate:

The sampling frequency for analog inputs can be chosen between 100 Hz and 30 kHz.

Pre-fault/Duration:

Recording duration before fault occurrence

Fig.: Recording settings

Fault/Recording mode static:

The recording duration is the defined **Maximum duration** whatever the actual fault duration. Subsequent faults which are detected during this time do not prolong recording.

Fault/Recording mode dynamic:

The recording duration is controlled by the actual length of the event which triggers recording but is limited by the Maximum duration. Subsequent faults which are detected during this time do not prolong recording.

Post-fault/Duration:

Recording duration which is added to the fault recording duration. Subsequent faults which are detected during this time prolong recording by provoking a restart of the fault recording duration. The maximum number of permissible subsequent triggers is set in the trigger parameters.

External trigger

The settings under **External trigger** are used to define the way this SHERLOG device is to behave in response to external cross-triggers which can be initiated by other SHERLOG devices. The crosstrigger information is exchanged between the participating SHERLOG devices via the KoCoS-Interlink interface.

Define trigger parameters

				E 33
Device ^	Digital fault recorder			
Analog inputs	Recording settings Tri	ner 📃		
Id Binary inputs	Event groups	1, in the second se	Event criteria	
Binary outputs			Name Rated Over	Under Delta Timeb
醇 Electrical environment へ				
C General				
😴 Functions 🔷			Instrument triggers	Trigger options
🎸 Digital Fault recorder			Unit #1 (2.000 Hz)	Trigger delay:
1 Dynamic disturbance reco			Unit #2 (5.000 Hz)	Trigger inhibit:
			External ID: -	Max. retriggers:
				Priority:
	L			
				OK Cancel

Up to 14 trigger events can be defined on the **Trigger** tab for the purpose of triggering fault records automatically.

Up to 16 **Event criteria** can be assigned to any one trigger event.

In addition, certain **Handling options** are possible for each trigger event.

Fig.: Empty trigger dialogue box

I Device ^	Digital fault reco	rder						
24 Analog inputs	Recording settings	Trigger						
24 Binary inputs	Event groups	* 🕄 🖳	Event criteria				13, I	泉 1
Binary outputs		50	Name Ra	sted	Over	Under	Delta	Timeb
Electrical environment		AGO						
Z General								
V Eurothann A			Instrument t	triggers		Trig	iger opt	tions
of rancoord			Unit #1 (2.	000 Hz)		Trip	ger delay	
G Digital Fault recorder			Unit #2 (5.	000 Hz)		Trib	ger inhibi	ii.
Dynamic disturbance reco			Evternal	to- [T-H	Max	rebione	ore
						Daire		
					6		-	

 Create a trigger event by clicking the Add button

Events can be renamed using the $\ensuremath{\textbf{F2}}$ function key.

Fig.: Create trigger events

Handling options

Handling options									
Instrument triggers	Trigger options	✓ Trigger inhibit							
☑ Unit #1 (2.000 Hz)	Trigger delay:	0 ms	Signal:						
V Unit #2 (5.000 Hz)	Trigger inhibit:	0 ms	() 1	-					
🗹 External ID: 4 💌	Max, retriggers;	1	Status:	Rising 👻					
	Priority:	1	Inhibit duration:	200 ms					

Fig.: Handling options

Instrument triggers

Unit #1 and Unit #2:

The check boxes are used to define which fault recorder units are to be started (triggered) by this event.

External:

The **External** check box is used to define whether this even is also to be passed on as a cross-trigger to other SHERLOG devices via the KoCoS-Interlink interface.

The ID is used to identify the cross-trigger information. In the external trigger configuration of the other SHERLOG devices it is possible to specify which IDs the devices react to. This allows the implementation of selective cross-triggers.

Handling options							
Instrument triggers	Trigger options		Trigger inhibit				
☑ Unit #1 (2.000 Hz)	Trigger delay:	0 ms	Signal:				
✓ Unit #2 (5.000 Hz)	Trigger inhibit:	0 ms	4 1	-			
🗹 External ID: 4 👻	Max. retriggers:	1	Status:	Rising 👻			
	Priority:	1	Inhibit duration:	200 ms			

Fig.: Handling options

Trigger options

Trigger delay:

Defines the time period which must elapse before a limit value violation triggers a recording.

A delay can be useful for some measurement tasks, in order to suppress starting currents, for example. Usually no delay is entered for fault recorder applications (0 ms) as all limit violations are supposed to trigger a recording without delay in this case.

Trigger inhibit:

An inhibit time can be defined for a trigger if repeated recording is not required when the same events occur several times in succession.

Triggering is suppressed when the same limit value violation occurs repeatedly in succession within the inhibit time. An inhibit time can be used to prevent intermitting triggers in this way.

Max. retriggers:

If a subsequent fault occurs within the post-fault period of a fault record, the record in progress is prolonged. The maximum number of triggers specifies how often recording may be prolonged. If the maximum number has been reached and another subsequent fault occurs, the record in progress is finished and a new record is started.

Priority:

It is possible to control the order in which data is transferred in automatic mode by entering a priority here to ensure that important records are transferred first.

The priority is also used for the automatic reporting functions. For example, reports on highpriority events can also be sent by email.

Priorities between 1 and 99 can be entered here, 1 having the top priority.

Trigger inhibit:

By configuring a trigger inhibit, it is possible to use a binary input to prevent a recording being triggered in response to this event.

An example of an application is the suppression of planned switch-ons or transitions.

The event is suppressed as long as the binary input concerned stays in the status set here. If the inhibit signal is only available as a pulse, a prolongation of the inhibit time can be achieved by means of the **Inhibit duration**.

Add event criteria

In order for trigger events to be able to become active, appropriate criteria must be assigned to them. All the criteria within an event are linked by the"or" operator. This means that events become active as soon as one or more criteria are violated.

Up to 16 criteria can be assigned to any one event.

Click the Add button to add an event criterion.

Trigger					
aje 🖳 🛱	k Event criteria				R. R. 🔟
	Name	Rated value	Over	Under	Delta dimebase
		11000 1000	0.101	0/100/	- Winner
	Trigger	Trigger aje aje Name	Trigger aje aje Name Rated value	Trigger Event criteria Name Rated value Over	Trigger Image: Image

Just to the second seco		
🖌 🗫 Busbar 110 kV 🔺	Name	
✓ 3 Analog signals	Busbar 110 kV	
v (U) Voltage	Spannung L1-N RMS	
Magnitude	Spannung L2-N RMS	
Phase Angle	Spannung L3-N RMS	
Form factor Creat factor	Systemfrequenz	
Crest ractor		
Frequency		
Unbalance		
Positive sequ		
Negative seg		
Zero sequence		
> 🔛 Harmonics		
> 🔛 Interharmonics		
T Line 1		
v 🔝 Analog signals		
> (I) Current		
> Power		
> (Z) Impedance v		
L1 L2 L3 N	Remove	
1000		
		OK Cancel

The **Signal picker** is opened in which criteria can be selected from the list of available criteria.

Analog and binary channels which have been assigned to a power system during the configuration of the electrical environment are listed under the name of that power system. Analog and binary channels which have not been assigned to a power system are available for selection under **Analog signals** and **Binary signals**.

Select a criterion and add it by clicking the button for the appropriate phase reference

Once the criteria have been selected, the limit values to be monitored can be selected and then set by clicking the **Edit criterion** button or by clicking the limit values and icons directly.

Sherlog CRX MJE														83
Device ^	Digital fault record	der												
☑	Recording settings	Trigger												
I Binary inputs	Event groups	aje 📑 🙀	Eve	ent cri	iteria							E	3 🖳 🖌	2
Binary outputs	Event 1			Name	2	Rated value		Over	L	Inder	ſ	Delta	Timebase	2
			۲	~ (n	none)									r١
Electrical environment				<	<binary #2="" input=""></binary>			20		Π.,				
🔽 General				<	<binary #3="" input=""></binary>					≥				
1 Line 1				<	<binary #4="" input=""></binary>			<u> </u>		×				
The 2				Y Bi	Busbar 110 kV									=
99 Durkes 110 kV				Sp	pannung L1-N RMS	63508,00 V	110,00%		90,00%	▼	0,00%		2 cycles	
** DUSDAF 110 KV				Sp	Spannung L2-N RMS	63508,00 V	110,00%		90,00%	-	0,00%		2 cycles	
E: Functions				Sp	Spannung L3-N RMS	63508,00 V	110,00%		90,00%	-	0,00%		2 cycles	
				S)	Systemfrequenz	50,00 Hz	50, 10 Hz		49,90 Hz	\checkmark	0,00 Hz		2 cycles	
AG Digital fault recorder				⊻ Li	ine 1									
M Dynamic disturbance reco				St	Strom L1 RMS	800,00 A	800,00 A		0,00 A	\bigtriangledown	0,00 A		2 cycles	
				St	Strom L2 RMS	800,00 A	800,00 A		0,00 A	\bigtriangledown	0,00 A		2 cycles	-
			Ha	landling	g options									
			In	strum	nent triggers	Trigger optic	ons		🗹 Т	✓ Trigger inhibit				
				Unit #	#1 (100 Hz)	Trigger delay:		0 ms	Signa	l:				
				Unit #	#2 (100 Hz)	Trigger inhibit:		0 ms	()	1			-	
				Exter	rnal ID: 4 💌	Max. retrigger	s: [1	Statu	s:	Rising		-	
						Priority:		1	Inhibi	t durat	ion:	200	ms	
											ОК		Cancel	

Fig. Event list with assigned criteria

Overtriggers, undertriggers or delta (change) triggers can be set either as absolute quantities or in percent in relation to the rated value.

It is important to note that all limit values refer to primary quantities.

Set analog trigger values	23
Reference settings	
Rated value:	63508,00 V
Limit settings	
✓ Levels in %	
Upper limit:	110,00%
✓ Lower limit:	90,00%
Rate of change:	0,00%
Timebase:	2 cycles
	0,00 % per cycle
ОК	Cancel

Fig.: Example for 110 kV bus bar

Example: Trigger on the phase-phase voltages of a 110 kV bus bar

Because the voltage levels given and the data of voltage transformers usually refer to phase-phase voltages, but the fault recorder usually measures the phase conductor against the star point or the earth, the factor $\sqrt{3}$ must be used when setting the trigger thresholds.

So the correct rated value of a 110 kV voltage level is 110 kV / 1.73 = 53508 V.

When setting the trigger threshold in percent it is important to note that 100% always refers to the rated value given. So an overvoltage of 10% should be entered as 110%.

5.3.7 Define dynamic disturbance recorder parameters

Unlike the, the dynamic disturbance recorder does not record the signal shape, but records values which are calculated from the signals, such as amplitude, phase angle, frequency, unbalance, etc..

The time resolution can be set anywhere between 1 Hz and 120 Hz. Binary inputs are always recorded with 10 kHz and therefore have a fixed time resolution of 100 microseconds (0.1 ms).

Dynamic (RMS) fault records consist of a pre-fault period and a post-fault period which is started with a trigger event.

Sampling rate and recording duration

Sherlog CRX MJE		
Device ^	Dynamic disturba	nce recorder
☑ Analog inputs	Recording settings	Signals and triggers
□ I Binary inputs	Sample rate:	10,00 Hz
Binary outputs	Pre-fault	
80 Electrical environment	Duration:	30,000 s
to record children	Post-fault	
General	Duration:	1800,000 s
T Line 1	External trigger	
T Line 2	Enabled:	
** Busbar 110 kV	Accepted trigger id:	1 -
Functions	Post-fault	
A Digital fault recorder	Duration:	0,000 s
Dynamic disturbance recorder	Max. recording time:	0,000 s
	Priority:	1

Fig.: Dynamic disturbance recorder - recording parameters

Sample rate:

The sampling rate (calculation interval) can be chosen between 1 Hz and 120 Hz.

Pre-fault:

Recording duration before fault occurrence. Duration of the pre-fault period max. 30 seconds.

Post-fault:

Recording duration starting with fault occurrence. Duration of the post-fault period max. 1800 seconds (30 minutes).

External trigger:

The settings under **External trigger** are used to define the way the SHERLOG device is to behave in response to external cross-triggers which can be initiated by other SHERLOG devices. The cross-trigger information is exchanged between the participating SHERLOG devices via the KoCoS-Interlink interface.

Select the signals to be recorded and define the trigger parameters

On the Triggers and signals tab the Add button can be used to select the measurement values which are to be recorded and enter the appropriate trigger criteria. For more information, see under the heading Add event criteria in the chapter titled Define digital fault recorder parameters.

Sherlog CRX MJE						• **
Device ^	Dynamic disturba	nce recorder				
🖾 Analog inputs	Recording settings	Signals and tri	ggers			
☑ I Binary inputs	Signals to be record	ded and trigge	rs			
☑ Binary outputs	Name	Rated value	Over	Under	Delta	Smebase
Electrical environment						v
🖉 General						
🛟 Line 1						
🗘 Line 2						
🞌 Busbar 110 kV						
Structions						
🗳 Digital fault recorder						
Dynamic disturbance recorder	Settings					
	Instrument trigg	jers	🔲 Trigger inhibi	t		
	External I	D: 1 🔻	Signal:	None	 Status: Rising 	
	Priority:	1	Inhibit duration:	0 ms		
					ОК	Cancel

amic disturbance recorder - Signals and triggers

5.4 Set time synchronisation

÷			Sherlog CRX		-	•
Sherlog CRX						
Settings App	V General Instrument settings functions Settings	5. Time	2			
5ettings		P	0			
Actual date &	time					
Device:	28.01.2000 04:28:25		Apply	to PC		
PC:	07.03.2013 14:35:31	13,107	Years			
Time zone:	(GMT) Koordinierte Welt	zek		×		
Synchronisatio	'n					
Method:	Internal GPS	*	History:			
			Time	Event		
Interlink output:	Electrical					
Interlink output: Pulse input:	Electrical	-	28.01.2000 01:09:42	Time settings changed		_
Interlink output: Pulse input:	Antenna Inverted	-	28.01.2000 01:09:42	Time settings changed		
Interlink output: Pulse input: Telegram input:	Electrical Antenna Inverted Antenna	-	28.01.2000 01:09:42	Time settings changed		

Fig.: SHERLOG time synchronisation

The time synchronisation can be set in the operating software or alternatively on the device display. For more information, see the SHERLOG **CRX Operating Instructions**.

At the moment the software only supports time synchronisation via the internal GPS receiver!

Functions of the device dialog window 6



Channel values		Filter by	n Date	+ today	+
1 Log	▼ Event	Criterion	Samplerate	Duration	Priority
11:46 LOG	5.744 Test trigger	🤏 External	100 Hz	1,15 s	1
Settings					
Maintenance					

Fig.: Selection of views in the device dialog window

6.1 **Digital fault recorder**

6.1.1 **Table of contents**

Ψ		Sherlog CRX			-		00
Sherlog CRX							
	📃 🔯 🗙 Delete	Duration ~ 2,0 s					
Digital fault recorder *	Download Analyse 🗙 Delete all	🚀 Test trigger 🔹					
View	Actions	Test					
Digital fault r	Date •	Event	Criterion	ter by: Date	* today	Pri	or
Digital fault r	ecorder		C Fit	er by: Date	- today		
Digital fault r	Date •	Event	Citerion	ter by: Date Samplerate	v today Duration	Pri	or
Unit DFR 1	Date • 02.01.2014 11:12:58.478	Event G Sammelschienenfehler	Giterion ▼ UL1-NRMS (cer by: Date Samplerate	+ today Duration 3,99 s	Pri	or
Unit DFR 1 DDR	Data • 02.01.2014 11:12:58.478 02.01.2014 11:12:00.093	Event o Sammelschienenfehler DDR	Criterion UL1-NRMS	Samplerate	v today Duration 3,99 s 46,80 s	Pri	or
Unit DFR 1 DDR DFR 1	Date Image: Control of the	Event o Sammelschienenfehler DDR Sammelschienenfehler	ULI-NRMS (ter by: Date Samplerate 2.000 Hz 30 Hz 2.000 Hz	 today Duration 3,99 s 46,80 s 3,99 s 	Pri	or
Unit DFR 1 DDR DFR 1 DDR DFR 1 DDR	Date • 02.01.2014 11:12:58.478 02.01.2014 11:12:00.093 02.01.2014 11:12:00.083 02.01.2014 11:12:00.683 02.01.2014 11:12:00.683 02.01.2014 11:12:00.683	Event of Sammelschienenfehler DDR Sammelschienenfehler DDR	Criterion ULI-NRMS (ULI-NRMS (ter by: Date Samplerate 2.000 Hz 30 Hz 2.000 Hz 30 Hz	 today Duration 3,99 s 46,80 s 3,99 s 46,37 s 	Pri	ior
Digital fault r Unit DFR 1 DDR DFR 1 DDR DFR 1 DDR DFR 2	Date 02.01.2014 11:12:58.478 02.01.2014 11:12:00.093 02.01.2014 11:12:00.093 02.01.2014 11:12:00.093 02.01.2014 11:12:00.093 02.01.2014 11:12:00.093 02.01.2014 11:12:00.093 02.01.2014 11:12:00.093	Event: o Sammelschienenfehler DDR Sammelschienenfehler DDR Testtrigger	Criterion ULI-NRMS (ULI-NRMS (ULI-NRMS (Streng ()esing	ter by: Date Samplerate 2.000 Hz 30 Hz 2.000 Hz 30 Hz S.000 Hz	- today Duration 3,99 s 46,80 s 3,99 s 46,37 s 2,55 s	Pri	ior
Digital fault r Unit DFR 1 DDR DFR 1 DDR DFR 1 DDR DFR 2 DDR	Date 02.01.2014 11:12:58-478 02.01.2014 11:12:50.093 02.01.2014 11:12:00.083 02.01.2014 11:12:00.83 02.01.2014 11:12:02:652 02.01.2014 11:12:652 02.01.2014 11:07:56.123 02.01.2014 11:07:56.123	Event G Sammelschienenfehler DDR Sammelschienenfehler DDR Testträgger DDR	Criterion → UL1-NRMS (→ UL2-NRMS (→ UL2-NRMS ()	ter by: Date Samplerate 2.000 Hz 30 Hz 2.000 Hz 30 Hz 30 Hz 30 Hz 30 Hz	today Duration 3,99 s 46,80 s 3,99 s 46,37 s 2,55 s 46,60 s	Pri	ior
Digital fault r Unit DFR 1 DDR DFR 1 DDR DFR 1 DDR DFR 2 DDR DFR 1	Date 02.01.2014 1112258.478 20.0.2014 1112258.478 02.01.2014 111220.083 02.0.1.2014 11120.083 02.01.2014 111102.452 02.01.2014 11102.452 02.01.2014 110756.129 02.01.2014 110756.129	Everit c Sammelschienenfehler DDR Sammelschienenfehler DDR Testrigger DDR Sammelschienenfehler	Citerion UL1+RPMS (UL2+RPMS (Extern (jesing UL2+RPMS (Date Samplerate 2.000 Hz 30 Hz 2.000 Hz 30 Hz 30 Hz 30 Hz 30 Hz 2.000 Hz 30 Hz 30 Hz 2.000 Hz 30 Hz 2.000 Hz	today Duration 3,99 s 46,80 s 3,99 s 46,37 s 2,55 s 46,60 s 3,99 s	Pri	ior

Fig.: Device dialog window: Digital fault recorder view

Dig	gitaler Stö	rschreiber						
					Filtern na	idh: Datum	 Heute 	
Ziel	hen Sie eine	Spaltenüberschrift in diesen Bereich	, um nach dieser zu gruppie	ren				
	Unit	Date	Event	Criterion		Samplerate	Duration	Priori
	DFR 1	02.01.2014 11:07:33.270	Sammelschienenfehler	🔺 UL2-NRMS	Q	2.000 Hz	4,00 s	
	DFR 1	02.01.2014 11:07:56.119	Sammelschienenfehler	VL2-NRMS	\bigcirc	2.000 Hz	3,99 s	
	DDR	02.01.2014 11:07:56.129	DDR			30 Hz	46,60 s	
	DFR 2	02.01.2014 11:08:45.223	Testtrigger	🧠 Extern (jesing	ghau	5.000 Hz	2,55 s	
	DDR	02.01.2014 11:11:02.652	DDR			30 Hz	46,37 s	
	DFR 1	02.01.2014 11:12:00.083	Sammelschienenfehler	📥 UL2-NRMS	\bigcirc	2.000 Hz	3,99 s	
	DDR	02.01.2014 11:12:00.093	DDR			30 Hz	46,80 s	
	DFR 1	02.01.2014 11:12:58.478	Sammelschienenfehler	UL1-NRMS	\bigcirc	2.000 Hz	3,99 s	
					K	iterien		
						Voltage L3-N I	RMS 0 ms	
					-	Voltage L2-N F	RMS 0 ms	
-					-	Voltage L1-N	MS 0 ms	In Course 1
Ges	samte Aufzei	ichnungen: 8 (2 heruntergeladen)						AIT (339

The device dialog window is the central control element for all actions which are directly related to the operation of the connected fault recorders. To open the device dialog window, double-click

the device concerned in the device list.

More than one device dialog window can be opened per device and the windows can be positioned, docked and grouped on the screen as required. For more information, see under Customize the user interface in the Analysis chapter.

Various views for the device dialog window can be selected from the list under **View**. They are described below.

When a device dialog window is opened, the Digital fault recorder view is shown automatically.

In the Digital fault recorder view, all the records currently saved in the memory of the fault recorder are displayed in a table of contents.

- DFR1: Transient fault recorder 1
- DFR2: Transient fault recorder 2
- DDR: Dynamic disturbance recorder

Records can be displayed, transferred to the PC and deleted; test recordings can be generated.

The disk symbol in the first column of the table of contents marks records which have already been transferred to the operating PC and have been saved in the record database.

Fig.: Fault recorder table of contents

Unit:	Recorder which generated the record (DFR1, DFR2 or DDR).		
Date:	Trigger date and time of the record.		
Event:	Name of the trigger event as defined under Handling options .		
Criterion:	Trigger criterion with indication of type: over, under or change (d/dt) . Further details can be shown by clicking the balloon.		
Samplerate:	Sampling rate with which the record was generated.		
Duration:	Duration of the whole record including the pre-fault, fault and post-fault periods.		
Priority:	Priority of the record as defined under Handling options .		

Functions of the device dialog window

6.1.2 **Filter records**

🔽 Filter by:	Date	-	today	-
	Sai Priority Stored on Type	l	ration Pr	iority
✓ Filter by: Date ▼ today ▼				•
	Samplerate	Du	today this week	1
			this month this year	
Fig : Dicplay filt	er			

If there are a large number of records in the device, it can be helpful to filter display on the basis of specific criteria.

Select the **Filter by** check box

Select a filter criterion >

6.1.3 Sort records

The default setting is for the latest records to be added at the top of the list (sorted by date in ascending order).

Click a column to change the sorting order. Each click switches the order between ascending and descending.

	Unit	Date 🔺 🕈	Event	Criterion	Samplerate	Duration	Priority		
Fig.:	Fig.: Column heading indicates sort by date in ascending order								

6.1.4 **Group records**



Right-click the column heading to open a context menu which lists further display functions for selection.

This makes it possible to group the display by different recording functions or events, for example.

function

6.1.5 **Transfer fault records**

Sherlog CRX							۵
Ta.	The American Strength	Duration ~ 2,0 s					
Digital fault	Dow Analyse 🗙 Delete al	🚀 Test trigger 🕞					
View	Actions	Test					
Digital fault	recorder						
			V	Filter by:	Date	* today	*
Unit	Date	Event	Criterion		Samplerate	Duration	Priority
DFR 1	02.01.2014 11:12:58.478	Sammelschienenfehler	UL1-NRMS	Q	2.000 Hz	3,99 s	1
DDR	02.01.2014 11:12:00.093	DDR			30 Hz	46,80 s	1
DFR 1	02.01.2014 11:12:00.083	Sammelschienenfehler	🔺 UL2-NRMS		2.000 Hz	3,99 s	1
DDR	02.01.2014 11:11:02.652	DDR			30 Hz	46,37 s	1
DFR 2	02.01.2014 11:08:45.223	Testtrigger	🤏 Extern (jesin	g	5.000 Hz	2,55 s	1
DDR	02.01.2014 11:07:56.129	DDR			30 Hz	46,60 s	1
DFR 1	02.01.2014 11:07:56.119	Sammelschienenfehler	UL2-NRMS		2.000 Hz	3,99 s	1
DFR 1	02.01.2014 11:07:33.270	Sammelschienenfehler	🔺 UL2-NRMS	\Box	2.000 Hz	4,00 s	1
Unit	Date • I	Event	Criterion		Samplerate	Duration	Priorit
DFR 1	02.01.2014 11:07:33.270	Sammelschienenfehler	A UL2-NRMS	Q	2.000 Hz	4,00 s	
DER 1	02.01.2014 11:07:56.119	Sammelschienenfehler	# 182-NRMS		2 000 Hz	3 99 6	

Fault records can be transferred manually to the database on the operating PC.

- Select the records required (use the shift or CTRL key for multiple selection)
- Start transfer by clicking the Download ≻ button

Records which have been downloaded are added to the database and are marked with a disk icon.
6.1.6 Open fault records

Shenog CRX							
Digital fault recorder *	Download Anel X Delete al	Duration ~ 2,0 s					
Digital fault i	recorder						
			V F	Filter by:	Date	* today	_
Unit	Date	Event	Criterion		Samplerate	Duration	Р
DFR 1	02.01.2014 11:12:58.478	Sammelschienenfehler	UL1-NRMS	Q	2.000 Hz	3,99 s	
DFR 1 DDR	02.01.2014 11:12:58.478 02.01.2014 11:12:00.093	Sammelschienenfehler DDR	UL 1-NRMS	Q	2.000 Hz 30 Hz	3,99 s 46,80 s	
DFR 1 DDR DFR 1	02.01.2014 11:12:58.478 02.01.2014 11:12:00.093 02.01.2014 11:12:00.083	Sammelschienenfehler DDR Sammelschienenfehler	UL1-NRMS		2.000 Hz 30 Hz 2.000 Hz	3,99 s 46,80 s 3,99 s	
DFR 1 DDR DFR 1 DDR	02.01.2014 11:12:58.478 02.01.2014 11:12:00.093 02.01.2014 11:12:00.083 02.01.2014 11:11:02.652	Sammelschienenfehler DDR Sammelschienenfehler DDR	UL1-NRMS	0	2.000 Hz 30 Hz 2.000 Hz 30 Hz	3,99 s 46,80 s 3,99 s 46,37 s	
DFR 1 DDR DFR 1 DDR DFR 2	02.01.2014 11:12:58.478 02.01.2014 11:12:00.093 02.01.2014 11:12:00.083 02.01.2014 11:11:02.652 02.01.2014 11:11:02.652	Sammelschienenfehler DDR Sammelschienenfehler DDR Testtrigger	ULI-NRMS	Q Q	2.000 Hz 30 Hz 2.000 Hz 30 Hz 5.000 Hz	3,99 s 46,80 s 3,99 s 46,37 s 2,55 s	
DFR 1 DDR DFR 1 DDR DFR 2 DDR	02.01.2014 11:12:58.478 02.01.2014 11:12:00.093 02.01.2014 11:12:00.083 02.01.2014 11:12:00.083 02.01.2014 11:11:02.652 02.01.2014 11:08:45.223 02.01.2014 11:07:56.129	Sammelschienenfehler DDR DDR Testtrigger DDR	UL 1-NRMS	Ç ,	2.000 Hz 30 Hz 2.000 Hz 30 Hz 5.000 Hz 30 Hz	3,99 s 46,80 s 3,99 s 46,37 s 2,55 s 46,60 s	
DFR 1 DDR DFR 1 DDR DFR 2 DDR DFR 1	02.01.2014 11:12:58.478 02.01.2014 11:12:00.083 02.01.2014 11:12:00.083 02.01.2014 11:12:00.083 02.01.2014 11:12:02.652 02.01.2014 11:12:02.652 02.01.2014 11:01:05:55.129 02.01.2014 11:07:55.129 02.01.2014 11:07:55.119	Sammelschienenfehler DDR Sammelschienenfehler DDR Testtrigger DDR Sammelschienenfehler	UL1-NRMS UL2-NRMS Extern [jesing UL2-NRMS	,	2.000 Hz 30 Hz 2.000 Hz 30 Hz 5.000 Hz 30 Hz 2.000 Hz	3,99 s 46,80 s 3,99 s 46,37 s 2,55 s 46,60 s 3,99 s	

Only those records can be opened which have already been downloaded to the record database, i.e. only the records marked with a disk icon.

- Select the record required (use the shift or CTRL key for multiple selection)
- Click the Analyse button

SHERLOG-Analysis is opened and the selected records are displayed



Records which have been downloaded from any device can be opened directly from the analysis software. For more information, see **Open records** under **SHERLOG-Analysis**.

6.1.7 Delete fault records

10000008-0000							
Ta.	Noteste	Duration ~ 2,0 s					
Digital fault recorder *	Download Analyse X De	l 🚀 Test trigger 🔹					
View	Actions	Test					
Digital fault i	recorder		V F	ilter by:	Date	▼ today	2
Unit	Date	 Event 	Criterion		Samplerate	Duration	Prio
DFR 1	02.01.2014 11:12:58.478	Sammelschienenfehler	UL 1-NRMS	Q	2.000 Hz	3,99 s	
DFR 1 DDR	02.01.2014 11:12:58.478 02.01.2014 11:12:00.093	Sammelschienenfehler DDR	UL 1-NRMS	Q	2.000 Hz 30 Hz	3,99 s 46,80 s	
DFR 1 DDR DFR 1	02.01.2014 11:12:58.478 02.01.2014 11:12:00.093 02.01.2014 11:12:00.083	Sammelschienenfehler DDR Sammelschienenfehler	UL1-NRMS	0	2.000 Hz 30 Hz 2.000 Hz	3,99 s 46,80 s 3,99 s	
DFR 1 DDR DFR 1 DDR	02.01.2014 11:12:58.478 02.01.2014 11:12:00.093 02.01.2014 11:12:00.083 02.01.2014 11:11:02.652	Sammelschienenfehler DDR Sammelschienenfehler DDR	UL1-NRMS	0	2.000 Hz 30 Hz 2.000 Hz 30 Hz	3,99 s 46,80 s 3,99 s 46,37 s	
DFR 1 DDR DFR 1 DDR DFR 2	02.01.2014 11:12:58.478 02.01.2014 11:12:00.093 02.01.2014 11:12:00.083 02.01.2014 11:12:00.083 02.01.2014 11:11:02.652 02.01.2014 11:08:45.223	Sammelschienenfehler DDR Sammelschienenfehler DDR Testtrigger	UL1-NRMS	Q Q	2.000 Hz 30 Hz 2.000 Hz 30 Hz 5.000 Hz	3,99 s 46,80 s 3,99 s 46,37 s 2,55 s	
DFR 1 DDR DFR 1 DDR DFR 2 DDR	02.01.2014 11:12:58.478 02.01.2014 11:12:00.093 02.01.2014 11:12:00.083 02.01.2014 11:12:00.083 02.01.2014 11:11:02.652 02.01.2014 11:08:45.223 02.01.2014 11:07:56.129	Sammelschienenfehler DDR Sammelschienenfehler DDR Testtrigger DDR	ULI-NRMS	Ç 	2.000 Hz 30 Hz 2.000 Hz 30 Hz 5.000 Hz 30 Hz	3,99 s 46,80 s 3,99 s 46,37 s 2,55 s 46,60 s	
DFR 1 DDR DFR 1 DDR DFR 2 DDR DFR 1	02.01.2014 11:12:58.478 02.01.2014 11:12:00.093 02.01.2014 11:12:00.083 02.01.2014 11:11:00.652 02.01.2014 11:11:11:02.652 02.01.2014 11:03:66.129 02.01.2014 11:07:56.119	Sammelschienenfehler DDR Sammelschienenfehler DDR Testtrigger DDR Sammelschienenfehler	ULI-NRMS	Ç	2.000 Hz 30 Hz 2.000 Hz 30 Hz 5.000 Hz 30 Hz 2.000 Hz	3,99 s 46,80 s 3,99 s 46,37 s 2,55 s 46,60 s 3,99 s	

Records can be deleted from the device dialog window either individually or all together.

- Click the **Delete** button
- Only selected records are deleted
 - Click the Delete all button
- All the records displayed are deleted

In both cases, only the records in the internal data memory of the device are deleted. Records which have already been downloaded to the PC remain in the database.

6.1.8 Trigger test recordings via the software



For certain measurement tasks or for the purpose of testing functionality, the two transient fault recorders DFR1 or DFR2 can be triggered manually by the user.

- Set required recording duration
- Activate test trigger for DFR1 or DFR2



Alternatively test triggers can be activated directly using the display of the SHERLOG device. For more information, see the **SHERLOG CRX operating instructions**.

6.2 Channel values

				Sherlog CRX	-	- 0	8
Sherlog	CRX						á
0	🗏 Primary valu	es					
Channel values *	🗮 Secondary v	alues					
View	Values						
Channel	values						
Channel	Designation	State	Channel	Name	Value	Unit	
1	Test		1	Sammelschiene 110kV.Sammelschienenspa	57,779	V	
2	<binäreingang< td=""><td>0</td><td>2</td><td>Sammelschiene 110kV.Sammelschienenspa</td><td>57,791</td><td>V</td><td></td></binäreingang<>	0	2	Sammelschiene 110kV.Sammelschienenspa	57,791	V	
3	<binäreingang< td=""><td>0</td><td>3</td><td>Sammelschiene 110kV.Sammelschienenspa</td><td>57,754</td><td>V</td><td></td></binäreingang<>	0	3	Sammelschiene 110kV.Sammelschienenspa	57,754	V	
4	<binäreingang< td=""><td></td><td>4</td><td>Sammelschiene 110kV.Sternpunkt-Verlage</td><td>0,259</td><td>v</td><td></td></binäreingang<>		4	Sammelschiene 110kV.Sternpunkt-Verlage	0,259	v	
5	<binäreingang< td=""><td>0</td><td>5</td><td>Leitung 2.Leiterstrom L1</td><td>0,001</td><td>V</td><td></td></binäreingang<>	0	5	Leitung 2.Leiterstrom L1	0,001	V	
6	<binäreingang< td=""><td></td><td>6</td><td>Leitung 2.Leiterstrom L2</td><td>0,000</td><td>٧</td><td></td></binäreingang<>		6	Leitung 2.Leiterstrom L2	0,000	٧	
7	<binäreingang< td=""><td>0</td><td>7</td><td>Leitung 2.Leiterstrom L3</td><td>0,000</td><td>V</td><td></td></binäreingang<>	0	7	Leitung 2.Leiterstrom L3	0,000	V	
8	<binäreingang< td=""><td></td><td>8</td><td><analogeingang #08=""></analogeingang></td><td>0,000</td><td>V</td><td></td></binäreingang<>		8	<analogeingang #08=""></analogeingang>	0,000	V	
9	<binäreingang< td=""><td>0</td><td>9</td><td>Leitung 1.Leiterstrom L1</td><td>0,007</td><td>A</td><td></td></binäreingang<>	0	9	Leitung 1.Leiterstrom L1	0,007	A	
10	<binäreingang< td=""><td></td><td>10</td><td>Leitung 1.Leiterstrom L2</td><td>0,007</td><td>A</td><td></td></binäreingang<>		10	Leitung 1.Leiterstrom L2	0,007	A	
11	<binäreingang< td=""><td>0</td><td>11</td><td>Leitung 1.Leiterstrom L3</td><td>0,009</td><td>A</td><td></td></binäreingang<>	0	11	Leitung 1.Leiterstrom L3	0,009	A	
12	<binäreingang< td=""><td></td><td>12</td><td><analogeingang #12=""></analogeingang></td><td>0,006</td><td>A</td><td></td></binäreingang<>		12	<analogeingang #12=""></analogeingang>	0,006	A	
13	<binäreingang< td=""><td>0</td><td>13</td><td><analogeingang #13=""></analogeingang></td><td>0,007</td><td>A</td><td></td></binäreingang<>	0	13	<analogeingang #13=""></analogeingang>	0,007	A	
14	<binäreingang< td=""><td></td><td>14</td><td><analogeingang #14=""></analogeingang></td><td>0,007</td><td>A</td><td></td></binäreingang<>		14	<analogeingang #14=""></analogeingang>	0,007	A	
15	<binäreingang< td=""><td>0</td><td>15</td><td><analogeingang #15=""></analogeingang></td><td>0,008</td><td>A</td><td></td></binäreingang<>	0	15	<analogeingang #15=""></analogeingang>	0,008	A	
16	<binäreingang< td=""><td></td><td>16</td><td><analogeingang #16=""></analogeingang></td><td>0,006</td><td>A</td><td></td></binäreingang<>		16	<analogeingang #16=""></analogeingang>	0,006	A	

The states of all the binary inputs and the measurement values of all the analog inputs are displayed in the **Channel values** view. The measurement values can be displayed as primary values or secondary values (measurement signal at the input terminal of the device).

Fig.: Device dialog window: Channel values

6.3 Log

Ŧ			Sherlog CRX			-	•	23
Sherlog) CRX							0
	-							
Log	Mark As C	opy to Custom						
· ·	Read Of	pboard *						
Yew	Entry	Grouping						_
Logbuch	Als gelesen i	narkieren						
Zeit		Nachricht		Subjekt	Kategorie	Gelesen am	-	
06.12.	2012 15:35:19	Measuring parameters	updated	IedUpdated	DeviceParameters	<ungelesen></ungelesen>		V
06.12.	2012 15:26:02	TimeSyncLoggedIn		TimeSyncLoggedIn	TimeSync	<ungelesen></ungelesen>		
05.12.2	012 15:23:56	New faultrecord recorded:	2012-12-06T15:23:44	NewRecord	Data	02.01.2013 14:23:40		
06.12.2	012 15:22:27	Measuring parameters upda	ited	IedUpdated	DeviceParameters	02.01.2013 14:23:40		4
06.12.2	012 15:21:32	Measuring parameters upda	ited	IedUpdated	DeviceParameters	02.01.2013 14:23:40		
06.12.2	012 15:17:56	Device started		Startup	HardwareConfigura	02.01.2013 14:23:40		~
1 05.12.2	012 15:16:14	PowerLost		PowerLost	HardwareConfigura	02.01.2013 14:23:40		1
3 05.12.2	012 15:13:44	Device started		Startup	HardwareConfigura	02.01.2013 14:23:40		
1 05.12.2	012 15:10:39	PowerLost		PowerLost	HardwareConfigura	02.01.2013 14:23:40		
06.12.2	012 15:05:41	Device started		Startup	HardwareConfigura	02.01.2013 14:23:40		
106.12.2	012 14:54:43	Time synchronization lost: n	node GPS, time 2012-12-0	TimeSyncLost	TimeSync	02.01.2013 14:23:40		
1 05.12.2	012 14:54:40	PowerLost		PowerLost	HardwareConfigura	02.01.2013 14:23:40		
05.12.2	012 14:46:16	TimeSyncLoggedIn		TimeSyncLoggedIn	TimeSync	02.01.2013 14:23:40		
1 06.12.2	012 14:45:09	Time synchronization lost: n	node GPS, time 2012-12-0	TimeSyncLost	TimeSync	02.01.2013 14:23:40		
06.12.2	012 14:44:09	New faultrecord recorded:	2012-12-06T14:43:55	NewRecord	Data	02.01.2013 14:23:40		
06.12.	2012 14:43:24	Measuring parameters	updated	IedUpdated	DeviceParameters	<ungelesen></ungelesen>	-	

The messages in the log provide information as to when the device was turned on or off, when records were made or when device parameters were changed, for example.

Using the ribbon or the tool bar located at the right-hand edge of the window, entries can be marked as read, deleted and copied to the Windows clipboard for documentation purposes.

Using the functions listed under **Grouping**, all messages can be grouped according to pre-defined criteria.

Fig.: Device dialog window: Log

6.4 Settings

÷	2	Sherlog CRX		-	-	
Sherlog CRX						
Settings Apply Gene	ral Instrument Time					
View	Settings					
Settings						
Device						
Name:	Sherlog MJE	Phase scheme:	-			
Location						
Substation:	Korbach	Voltage level:	0,4 kVAC -			
Monitored component:	Büro PM					
e						
Connection	700 / 10		01000			
Type:	107/10	Port:	21320			
 Obtain an IP addres 	s automatically					
O Use the following IP	address					
IP address:		Subnet mask:	255.255.255.0			
Defends ashering						

All the parameters for the fault recorder can be defined in the **Settings** view. The various different parameter areas **General settings**, **Instrument functions** and **Time synchronisation** are described in the chapter titled **Define device parameters**.

Fig.: Device dialog window: Settings

6.5 Maintenance

6.5.1 Device update

The device software can be updated using the **Device update** function. The device update does not involve any changes to the device configuration. Once the update

procedure has been completed successfully, the device puts itself back into operation.

		Sherlog CRX	0	23
Sherlog C	RX			۵
X				
Maintenan	се			
View			 	
View Maintena Device U	ince pdate			
View Maintena Device U File:	nce pdate <please choose<="" td=""><td>e an update file></td><td> </td><td></td></please>	e an update file>	 	

- Specify the path of the appropriate device update file in the **File** text box
- Start the update by clicking the Update button.



Device updates can also be carried out directly on the device itself using a USB flash drive. For more information, see the **SHERLOG CRX operating instructions**.

7.1 **Online data display**

=			Sherlog CR	<			-	•	23
Sherlog CF	ex.								0
Digital fault recorder *	Download Analyse	X Delete	Duration	~ 2,0 s 🙄					
Di Di	igital fault recorder	ns	1	Test					_
0	honel values				Filter by:	Date	- today		
III Lo	w.	•	Event	Criterion		Samplerate	Duration	Priori	kγ
<u>со</u> 5е <u>Х</u> м	ettings aintenance	No re	ecord	s availa	ble				
ig.: Ca	alling up the	online n	neasui	ement v	alue	s from	the devi	ice	_

In the SHERLOG device dialog window, the current measurement values of the analog and binary inputs can be displayed using the Channel values function.

As the user can switch between primary and secondary values in this display, it is particularly suitable for checking the configured transformer ratios during commissioning.

dialog window

Channel values *	Primary va	values				
Channel	values					
Channel	Designation	State	Channel	Name	Value	Unit
1	<binäreingang< td=""><td></td><td>1</td><td>Bus 1.Sammelschienenspannung L1N</td><td>7,168</td><td>V.</td></binäreingang<>		1	Bus 1.Sammelschienenspannung L1N	7,168	V.
2	<binåreingang< td=""><td></td><td>2</td><td>Bus 1.Sammelschienenspannung L2N</td><td>6,562</td><td>٧</td></binåreingang<>		2	Bus 1.Sammelschienenspannung L2N	6,562	٧
3	<binäreingang< td=""><td>0</td><td>3</td><td>Bus 1.Sammelschienenspannung L3N</td><td>6,309</td><td>v</td></binäreingang<>	0	3	Bus 1.Sammelschienenspannung L3N	6,309	v
4	<binäreingang< td=""><td></td><td>4</td><td><analogeingang #04=""></analogeingang></td><td>6,231</td><td>v</td></binäreingang<>		4	<analogeingang #04=""></analogeingang>	6,231	v
5	<binäreingang< td=""><td>۲</td><td>5</td><td><analogeingang #05=""></analogeingang></td><td>0,005</td><td>٧</td></binäreingang<>	۲	5	<analogeingang #05=""></analogeingang>	0,005	٧
6	<binäreingang< td=""><td></td><td>6</td><td><analogeingang #06=""></analogeingang></td><td>0,004</td><td>V.</td></binäreingang<>		6	<analogeingang #06=""></analogeingang>	0,004	V.
7	<binäreingang< td=""><td>۲</td><td>7</td><td><analogeingang #07=""></analogeingang></td><td>0,004</td><td>V.</td></binäreingang<>	۲	7	<analogeingang #07=""></analogeingang>	0,004	V.
8	<binäreingang< td=""><td></td><td>8</td><td><analogeingang #08=""></analogeingang></td><td>0,004</td><td>٧</td></binäreingang<>		8	<analogeingang #08=""></analogeingang>	0,004	٧
9	<binäreingang< td=""><td>0</td><td>9</td><td>New Line 1.Leiterstrom L1</td><td>0,034</td><td>A</td></binäreingang<>	0	9	New Line 1.Leiterstrom L1	0,034	A
10	<binäreingang< td=""><td></td><td>10</td><td>New Line 1. Leiterstrom L2</td><td>0,035</td><td>A</td></binäreingang<>		10	New Line 1. Leiterstrom L2	0,035	A
11	<binäreingang< td=""><td>0</td><td>11</td><td>New Line 1.Leiterstrom L3</td><td>0,006</td><td>A</td></binäreingang<>	0	11	New Line 1.Leiterstrom L3	0,006	A
12	<binäreingang< td=""><td></td><td>12</td><td><analogeingang #12=""></analogeingang></td><td>0,012</td><td>A</td></binäreingang<>		12	<analogeingang #12=""></analogeingang>	0,012	A
13	<binäreingang< td=""><td>0</td><td>13</td><td><analogeingang #13=""></analogeingang></td><td>0,014</td><td>A</td></binäreingang<>	0	13	<analogeingang #13=""></analogeingang>	0,014	A
14	<binåreingang< td=""><td></td><td>14</td><td><analogeingang #14=""></analogeingang></td><td>0,025</td><td>A</td></binåreingang<>		14	<analogeingang #14=""></analogeingang>	0,025	A
15	<binäreingang< td=""><td>0</td><td>15</td><td><analogeingang #15=""></analogeingang></td><td>0,022</td><td>A</td></binäreingang<>	0	15	<analogeingang #15=""></analogeingang>	0,022	A
16	<binäreingang< td=""><td></td><td>16</td><td><analogeingang #16=""></analogeingang></td><td>0,005</td><td>A</td></binäreingang<>		16	<analogeingang #16=""></analogeingang>	0,005	A

Fig.: Online measurement values



Fig.: Device context menu with list of measurement values

Another way of displaying online measurement values is to call them up from the context menu in the device list (right-click the device concerned).

Using the context menu, analog and binary inputs can be opened in separate windows. It is also possible to create views with user-defined measurement values.

7.2 Configure automatic tasks

A number of functions can be automated using automatic tasks, including the following:

- Data transfer from individual devices to the common record database
- Fault report creation
- Dispatch and print of fault reports and records
- Data export in various formats
- Signaling of system errors

Start Device list	Configuration	View				
Plant topology View	Custom column IP address Show last upda	value: + te	Add device	🗙 Delete dit	Automatic task Settinga	General
ີ; · Device list	÷×					
Name						
🛅 Sherlog CRX	9					
Sherlog CRX	9					

- Switch to the Device list tab
- > Select a device
- Click the **Automatic tasks** button



Fig.: Device list / Automatic tasks

The settings for data transfer, for the dispatch of reports and for data export can be made separately for each individual SHERLOG device.

Only the interval times defined for data transfer are general settings which apply globally to all connected SHERLOG devices.

7.2.1 Automatic data transfer

In order to create reports and to analyse recorded data, the data must be transferred to the common record database. The transfer can be automated with time control.

anage Scheduled T	asks			23	
Transfer data	Send reports	Export data			
Enable polling					
📃 Refrest	n device state				
every 1	.0 second(s)				
🔲 Digital f	ault recorder #1	(DFR #1)			
every C) second(s)				
🔲 Digital f	ault recorder #2	2 (DFR #2)			
every C) second(s)				
🔲 Dynami	c disturbance re	corder (DDR)			
every C) second(s)				
E ta lla					
Edit pollin	ng interval				
			OK	Cancel	
a.: Automatic	tasks: Tran	sfer data			

Call up the Transfer data tab

The **Refresh device state** function updates the device status in the device list as well as the record directory in the device dialog window. For more information, see the chapter titled **First steps** and consult the section **Activate automatic queries**.

This function should always be activated for every device.

Activation of automatic data transfer for the available recording functions (DFR1, DFR2 and DDR) is a prerequisite for automatic report creation and data export.

If automatic data transfer is deactivated, no new data are transferred and so the data cannot be subjected to further processing.

Use the **Edit polling interval** button to set the interval time.

ſ	

Automatic data transfer can be activated separately for all recording functions. The interval can only be edited globally as a general setting with the **Edit polling interval** button.

7.2.2 Create reports automatically

Rep	ports:								
		Description		Send to		Priority	Content	Add	,
۷	Instru	ment: Digital Fau	It Record	ler #1					
		New Mail Report				9	0 🔁	Edit	
	73	New Printer Repor	t	\\fs-kocos2.kocos	local\PS	3	0	Delete	
		New File Report					0 🔁	-	
¥	Instru	ment: Digital Fau	It Record	ler #2					
	1	New Mail Report				9	0 🄁		
		New Printer Repor	t	Microsoft XPS Doc	ument Wr	3	0		
		New File Report					0 🏂		
¥	Instru	ment: Dynamic I	Disturban	ce Recorder					
	7 🖂	New Mail Report					0 🔁		
	73	New Printer Repor	t	Microsoft XPS Doc	ument Wr	3	0		
	VI	New File Report					0 🔁		
									_

After automatic data transfer, the data can be compiled in a fault report.

Switch to the Send Reports tab

Fault reports can be automatically sent by email, printed out or saved.

For each recording function (DFR1, DFR2 and DDR) 3 tasks are available as templates which can be activated and configured if required.

Tasks can be created, edited or deleted at any time, using the **Add**, **Edit** and **Delete** buttons.

Send fault reports by email

Rep	ports:							
	D	escription	Se	end to	Priority	Content	Add	
¥	Instrum	ent: Digital Fai	ult Recorde	r #1				
	🗐 🖂 N	ew Mail Report			1	1	Edit	
	V 🍕 N	ew Printer Repo	rt \\	fs-kocos2.kocos.local\PS		0	Delete	e
	🗐 🗋 N	ew File Report				1	-	
¥	Instrum	ent: Digital Fai	ult Recorde	r #2				
	V 🖂 N	ew Mail Report				1		
	🔲 🍕 N	ew Printer Repo	t M	crosoft XPS Document Wr		0		
	🔲 🗋 N	ew File Report			1	D 74		
Y	Instrum	ent: Dynamic I	Disturbance	Recorder				
	V 🖂 N	ew Mail Report			9	12		
	🛛 🍠 N	ew Printer Repor	rt M	crosoft XPS Document Wr		3		
	VIN	ew File Report			1	o 🔁		

Fault reports can be sent automatically by email by selecting the task **New Mail Report**.

For this purpose, the task concerned must be configured by specifying email addresses, the required report format and any attachments that are needed.

- Select the **New Mail Report** task
- Click the Edit button

Fig.: Automatic tasks: Send reports

≤ Edit Mail Report	t	
Mail Report		
Priority:	0 ‡	
Instrument	Digital Fault Record	der #1 👻
Description:	Fehlerbericht für Le	eitwarte
Send to:		Add
	Leitwarte@EVU.cor Admin@EVU.COM	m Remove
Report		
Template:	Default 🔻	Format: PDF 💌
✓ Signallist		✓ Colored print-out
Z Extremevalu	es	Print Cursor
Fault Locatio	ns	Print Fault Ranges
Binary Event	Summary	Use RMS Values
Relative	Time	Scale to Best Range
		Hide Unchanged Binarysignals
Attachments		
Record		
CSV		
Comtrade		
		<u>O</u> K <u>C</u> ancel

The Edit Mail Report dialogue box is called up

Enter the settings for sending the email, for the report format and for any attachments required.

Priority

During configuration of the fault recorder, a priority between 1 and 99 can be assigned to each fault record under **Handling options**, 1 being the top priority.

> Select a priority in the **Priority** list box Reports for fault records with the selected priority or with a higher priority are automatically sent by email.

Sector Se	E-Mail		
🔒 Notifications	Authenticatio	n method	
Preferences	No authenticatio	n 🔽	
S User data	Server inform	ation	
🖂 E-Mail	Host:		
El. Log	Port:	25 1	
~ *		The server requires an encrypted connection (SSL)	
View ^	Credentials		
🙏 Phase scheme	Username:		
Screen layout	Password:		
	Sender inform	ation	
😫 Data management 🔷 🔨	Address:		
🎼 Master data	Name:		
🍋 Data storage			
Data acquisition ^			
🐁 Automatic requests			
Fig.: General sett	inas: Em	ail	

Print report

😼 Edit Printer Repo	rt	Σ			
Printer Report					
Priority:	0 ‡				
Instrument	Digital Fault	ecorder #1			
Description: New Printer Re		leport			
Printer:		os2.kocos.local\PS-AS1			
Report					
Template:	Default	•			
✓ Signallist		✓ Colored print-out			
Extremevalues		Print Cursor			
Fault Locations	;	Print Fault Ranges			
Binary Event S	ummary	Use RMS Values			
🗸 Relative Tir	ne	✓ Scale to Best Range			
		Hide Unchanged Binarysignals			
		OK Cancel			

Fig.: Automatic tasks: Edit printer report

Save report as file

Edit File Report						23
File Report						
Priority:	0 0					
Instrument	Digital Fault	Recorder	#1			-
Description:	New File Rep	ort				
Destination path:						
Report						
Template:	Default	-	Format:	PDF	-	-
Signallist		V C	olored print-out	:		
Extremevalue	s	P	rint Cursor			
Fault Location	s	🗖 P	rint Fault Range	s		
Binary Event 9	Summary	🗖 U	Use RMS Values			
📝 Relative T	ime	🗖 S	cale to Best Rar	nge		
		🗆 H	ide Unchanged	Binary	ysignals	
			ОК		Cance	

An email account is required for sending emails. The account details can be entered under **General settings**:

- On the Configuration tab, click the Settings button
- > Under Workspace, call up E-mail.
- > Enter the account details

Fault reports can be printed out automatically by selecting the **New Printer Report** task.

For this purpose, the task concerned must be configured by specifying the printer and the report format.

Fault reports can be saved automatically as a file by selecting the task **New File Report**.

For this purpose, the task concerned must be configured by specifying the required file path and the report format.

7.2.3 Automatic data export

Inage Scheduled Tasks Transfer data Send reports: Format F	ts Export data	23 Add Edt Delete	 After automatic data transfer, the data can be exported automatically in the following formats: Comtrade, Event or CSV. Switch to the Export Data tab Select a task Click the Edit button
g.: Automatic ta	asks: Export data	OK Cancel	The Edit Export dialogue box is called up Configure the task by specifying the
Export Instrument: Format: Priority: Destination:	Digital Fault Recorder #1 Comtrade	······································	required format and the destination
Desunauon;	ОК	Cancel	

Fig.: Parameters for data export

7.2.4 **Activities**

All the data transfer activities which are currently in progress between the PC and the connected measuring instruments are displayed Under Activities. Using this dialogue box, it is also possible to selectively switch on/off the automatic tasks configured for individual devices.

Start Geräteliste Konfiguration	Ansicht				
Ansicht Iaden * Anzeige	Geräte- dialog * Parameter *	Aufzeichnung Werte Logbuch Device	en - 🖒 Aktualisieren	 Pausieren Fortsetzen Einstelungen Verbindungen 	Analyse Tools
Aktivitäten Activities Tasks					Ψ ×
Status		Estimate	Progress		
Type: FileDownload					
Downloading record	20_15_33_4				Cancel
Downloading record				Cancel	
Downloading record	<1 second			Cancel	
Downloading record	20_16_13_3				Cancel
Downloading record	20_16_12_1				Cancel

On the Start tab, click the Activities button

The activities list is opened.

Data transfer activities currently in progress between the PC and the connected measuring devices are displayed on the Activities tab.

Tasks list

All the automatic tasks already configured for all the devices in the device list are displayed on the Tasks tab.

;• Geräteliste		÷×	Aktivitaten		t d
Name	IP-Adresse		Activities Tasks		
✓ IIII Netztopologie			Name	Next execution	State
 ✓ ∑ Korbach ✓ Ø 0,4 kVAC ✓ Ø 8ay =E01 ☑ Sherlog MJE ✓ Ø 10 kVAC ✓ Ø 10 kVAC ✓ Ø Bay =E02 ☑ Sherlog UK 	192, 168, 2, 50 192, 168, 2, 90	9 E,	RefreshNetwork DDRPolingTask Sherlog MJE Sherlog UK DFR2PolingTask Sherlog UK DFR2PolingTask Sherlog UK Sherlog UK	03.01.2013 12:21:24 03.01.2013 12:21:24 03.01.2013 12:21:24 03.01.2013 12:21:24	

Fig.: Activities list with progress bar

The **Next execution** column indicates when the task concerned will next be executed.

Tasks marked Pare active.

Tasks marked ⁽¹⁾ are on hold.

Use the left-hand mouse button to click the icon in order to switch between active and on hold. Automatic tasks can be selectively stopped and restarted for specific devices in this way.

7.3 Log

The log contains status messages and data downloads of fault records of all the devices in the device list, for example.

In addition, the logs of individual devices can be displayed in the **Device dialog** window. For more information, see the under Log in the chapter titled Functions of the device dialog window.

Ansicht Geräte- Aktiv Iste Anzeige	titaten Logarth Logarth Carille Mess- dalog Parameter - Device	eidhnungen e - C Al uch	ktualisieren	 Pausieren Fortsetzen Einstellungen Verbindungen 	Analyse Tools
Logbuch					
Zeit 🔹	Nachricht	Subjekt	Kategorie	Gelesen am	-
03.01.2013 12:10:09	Restored connection to device Sherlog UK (IP:192.16	Reconnected	Connection	<ungelesen></ungelesen>	
03.01.2013 11:53:08	Faultrecord downloaded: 25.12.2012 21:15:33	RecordDownloaded	Data	03.01.2013 13:11	* B
03.01.2013 11:53:07	Faultrecord downloaded: 25.12.2012 21:16:13	RecordDownloaded	Data	03.01.2013 13:11	년
03.01.2013 11:53:07	Faultrecord downloaded: 25.12.2012 21:16:12	RecordDownloaded	Data	03.01.2013 13:11	-
03.01.2013 11:53:06	Faultrecord downloaded: 25.12.2012 21:17:26	RecordDownloaded	Data	03.01.2013 13:11	
03.01.2013 11:53:05	Faultrecord downloaded: 25.12.2012 21:15:26	RecordDownloaded	Data	03.01.2013 13:11	
03.01.2013 11:53:04	Faultrecord downloaded: 25.12.2012 21:12:28	RecordDownloaded	Data	03.01.2013 13:11	
03.01.2013 11:53:02	Faultrecord downloaded: 25.12.2012 21:12:34	RecordDownloaded	Data	03.01.2013 13:11	
03.01.2013 10:53:27	Restored connection to device Sherlog MJE (IP: 192. 168.2.50)	Reconnected	Connection	03.01.2013 13:11	
03.01.2013 10:50:16	Faultrecord downloaded: 03.01.2014 09:32:25	RecordDownloaded	Data	03.01.2013 13:11	
03.01.2013 10:50:02	Faultrecord downloaded: 03.01.2014 09:32:16	RecordDownloaded	Data	03.01.2013 13:11	
03.01.2013 10:48:36	Faultrecord downloaded: 03.01.2014 09:32:08	RecordDownloaded	Data	03.01.2013 13:11	
03.01.2013 10:34:42	Faultrecord downloaded: 21.12.2012 12:48:49	RecordDownloaded	Data	03.01.2013 13:11	
03.01.2013 10:34:41	Faultrecord downloaded: 18.12.2012 12:00:40	RecordDownloaded	Data	03.01.2013 13:11	
03.01.2013 10:34:40	Faultrecord downloaded: 17.12.2012 08:02:58	RecordDownloaded	Data	03.01.2013 13:11	
03.01.2013 10:34:39	Faultrecord downloaded: 18.12.2012 12:00:44	RecordDownloaded	Data	03.01.2013 13:11	
03.01.2013 10:34:37	Faultrecord downloaded: 17.12.2012 08:25:12	RecordDownloaded	Data	03.01.2013 13:11	
03.01.2013 10:34:36	Faultrecord downloaded: 07.12.2012 15:55:09	RecordDownloaded	Data	03.01.2013 13:11	
03.01.2013 10:34:35	Faultrecord downloaded: 06.12.2012 18:01:08	RecordDownloaded	Data	03.01.2013 13:11	

On the Start tab, click the Log button The log is opened.

Using the ribbon or the tool bar located at the right-hand edge of the window, entries can be marked as read, can be deleted and can be copied to the Windows clipboard for documentation purposes.

Using the functions listed under Grouping, all messages can be grouped according to predefined criteria as required by the user. For more detailed information, see under **Table of contents** in the chapter titled Digital fault recorder.

7.4 Change the SHERLOG CRX IP address

The IP connection parameters can either be set on-site using the display of the SHERLOG device or remotely via the software.

If the IP connection parameters of a SHERLOG which has already been registered in the software are changed via the device display, this change must also be made in the software, so that the device can be accessed again in the software.

23

Ψ×

0

Cancel

7.4.1 Example: SHERLOG IP address has been changed on the device

Name	IP-Adress:	
Sherlog MJE	192.168.2.136	0

A SHERLOG CRX with the IP address 192.168.2.136 was added to the device list of the software. Later the SHERLOG IP address was changed on the display of the SHERLOG device. As a result, the device cannot be accessed via the software.

The icon \bigcirc for a communication fault is displayed in the device list.

Update connection parameters in the software

Connection Settings - Sherlog CRX

Connection type:

Fig.: Connection settings

E Sherlog MJE

🖗 Device list

Name

IP-Adress:

Port:

Start	Geräteli	ste Kor	nfiguration	Ansicht					
Ansicht laden *	Geräte- liste An	Aktivitäten zeige	Logbuch	Geräte- dialog *	M Parar	ess- neter	Aufzeichnungen Werte - & Aktualsieren Eij, Logbuch Device (Sherlog MJE)	 Pausieren Fortsetzen Einstelungen Verbing Agen 	Analys Tools
i <mark>:) Geräte</mark> l Name	iste		IP-Adresse		ņ	×		Einstellungen	
~ ∰ Netz ~ ∰ Kc ~ <i>9</i> ~ 1	topologie Irbach 0,4 kVAC M ^e Büro PN	1							
	= Charl	og MIE	192 168 2	136	0	a			

TCP/IP

Fig.: Device list displays functioning communication

192.168.2.108 21320 🛟 -

Apply

IP-Adress:

192, 168, 2, 50

- Select the device concerned in the device list
- On the Start tab, click the Settings button in the Connection group

The **Connection settings** dialogue box is called up.

\succ	Enter the correct IP parameters for the
	device in the Connection settings
	dialogue box and click the Apply button

Once the new connection parameters have been entered, the device can be accessed again.

The icon ${}^{ imes}$ is displayed in the device list.

Doc. 7218001 - Rev. 1.00

7.4.2 Example: IP connection settings via remote access using the software

The IP connection settings of SHERLOG devices can be edited in the software via remote access if the data connection is functioning correctly.

- > Double-click the device concerned to open the device dialog window
- > Switch to the the **Settings** view

";- Geräteliste		÷ ×	÷	Sher	log CRX	- 8 %
Name	IP-Adresse		Sherlog CRX			6
✓ III Netztopologie ✓ ∰ Korbach ✓ Ø 0,4 kVAC ✓ PBüro PM Sherlog MJE	192.168.2.132	0 El	Settings View	eral Instrument Time functions		
			Settings Device			
			Name:	Sherlog CRX	Phase scheme:	*
			Location Substation: Monitored component:		Voltage level:	<none> 💌</none>
			Connection			
			Туре:	TCP / IP	Port:	21320
			 Obtain an IP address Use the following IP 	; automatically address		
			IP address:	192.168.2.31	Subnet mask:	255,255,255,0
			Default gateway:	192.168.2.2		
			<u>[</u>			
(¹) 10:19:01 - Bereit		}				Gestörte



- Enter the changes
- Activate the changes by clicking the Apply button



This method changes the IP connection settings of the SHERLOG devices as well as the corresponding settings in the software of the PC in use.

If the access to the changed SHERLOG device is to be configured for further PCs, the IP address must be changed manually on these PCs. For more information, see under **Editing connection parameters in the software**.

7.5 User Manager

With the **User Manager** new users can be added, existing users can be deleted and user passwords can be defined and changed.

Start	Device list	Configuration	View	 On the Configuration tab, click the User Manager button
Settings	Log on Log on Change E Show pr Active user	password ivileges [dsude]	Manager Manager	
Bitte Benutzernamen Benutzername:	i eingeben			 Enter the user name and, if required, the password
Deccuerti				
Passwort.		- tink ld		
L	OK	Abbrechen		
Rile Settings Help				The Account Manager is called up.
🚾 Users 🔄 Groups	Coptions			
Users			5 5 2	
Name Suest		Full name Guest		Using the tool bar the following actions can be
State Administrator		Administrator		carried out:
				Add: Create a new user
				Delete: Delete a user
				Edit : Edit the user properties
10:12:04 •				

7.5.1 Add/edit user

Properties: ()	
🚰 General 🛛 🐴 Gro	ups 🚜 Privileges
General	
Name:	
Full Name:	
Password	
Password:	Change Password
Lock view	
Locked Since:	01.01.0001 00:00:00 ~
🔲 Windows Integr	ation
Windows User:	
	OK Cancel

Click the Add or Edit icon

The **User Properties** dialogue box is called up.

 Enter/edit the user properties and confirm with **OK**

Change password, see below.

7.5.2 Define/change password

User Properties: () General Seneral Name: Full Name: Full Name: Password Password Lock view Locked Since: 01.01.0001 00:00:00 Windows Integration Windows User: OK Cancel	 On the Configuration tab, click the User Manager button to open the Account Manager Select user Click the Change Password button
User Manager Old password: New password: New password (confirmation): OK Cancel	 A dialogue box for changing the password is called up. Enter the old and new passwords and confirm with OK
Start Device list Configuration View Image: Settings Image: Show mileges Active user (dsude) Image: Show mileges User Manager Image: Show mileges Active user (dsude)	Alternatively, the dialogue box for changing the password can be called up from the Configuration tab. However, in this case changes can only be made for the user who is currently logged in.

If the dialogue box for changing the password is called up in the **User Manager**, changes can be made for all the users.

8 Support

8.1 Software version



The technical support department will need to know the version number of the **SHERLOG.EXE** programme file if technical support is required. A window displaying the licence and version numbers of the software is shown in the background when the programme is started and during log-in. To call up the info window:

> Call up the **View** tab

> In the **Help** group, click the **About** button The programme info window is called up.

8.2 System information



It may be necessary to provide detailed system information when requesting technical support.

Click the System info button

Detailed system information is called up and can be saved as a file.

9 SHERLOG-Analysis

The SHERLOG analysis software is used for the evaluation of recordings made by SHERLOG CRX fault recorders.

The software contains a comprehensive range of powerful analysis tools for the assessment of recorded data:

- Useful zoom functions and variable scaling
- Simultaneous display, superimposition and synchronisation of more than one fault record
- Vector displays
- Harmonic analysis on the basis of full waves or to IEC 61000-4-7 with interharmonics
- Nyquist plot
- Determination of fault location
- Freely configurable absolute and delta measurement cursors
- Formulary and formula editor for the calculation of further power system quantities
- Individual report creation using the clipboard
- Automatic report creation

Fault location

The fault locator can characterise faults quickly as well as calculating the fault loop and detailing the fault type, fault impedance and fault location.

Mathematical signal analysis

A formula editor can be used to make further mathematical calculations within fault records. The results are added to the fault record as an additional signal.

Data formats

Import and export functions enable data to be exchanged between different systems using standard COMTRADE, CSV and PQDIF file formats.



9.1 Start the programme

The analysis software can be started as a separate application via the Windows start menu or a link on the desktop as well as via the SHERLOG-Online application.

9.1.1 Start the programme as separate application

Analyse	
Please enter your u	user name
Username:	jesinghausen 💌
Password:	
	Automatically logon this user
	OK Cancel

 Click the appropriate entry in the Programmes folder of the Windows[®] start menu or the application icon on the desktop

Log-in

The software has been designed to give only selected people access to certain programme functions. If the software is started separately, it is necessary to enter the user name.

9.1.2 Start the programme from SHERLOG-Online

Lad screen Device Activities Log Device Manual control Device Manual control Device Manual control Device Manual control Device Reference Device Device Reference Device Device Reference Device Device </th <th>Vame</th> <th>ogy</th> <th>IP-Adresse</th> <th></th> <th></th> <th></th> <th></th> <th></th>	Vame	ogy	IP-Adresse					
Load screen Device Activities Log Device Activities Log Device Protocol Device	: Device list			ņ	×			Analyse
Start Device list Configuration View	Start De	vice list C Device list View	bes Log	View	Measurement setup + Device	Records Values - CRefresh Log (Sherlog MJE)	Suspend Resume Settings Connection	Analyse

Use the **Analyse** button on the **Start** tab to call up SHERLOG-Analysis directly from SHERLOG-Online.

In this case no log-in is necessary because the user is already logged in for SHERLOG-Online.

9.1.3 File tab



When SHERLOG-Analysis is started, the **File** tab is called up.

Open from file system

SHERLOG or COMTRADE records can be opened from any storage location.

Open

Open records from the SHERLOG database.

9.1.4 Open individual records from the Online device dialog window

<u>ی</u> د	SHERLOG	- 8 2
Start Device list Configuration	View	a 🌏 🔏
Load screen	Device Measurement etc. Sheriog CRX]	Suspend Resume Analyse Connection Toole
"p Device list 🕴 🛠	⇒ Sherlog CRX	- 8 8
Name	Sherlog CRX	۵
Electron of the second	Digital faut recorder + View Actions Control faut	Duration ~ 2,0 s : % Test bigger ~ Test
	Filer	r by: Date = today =
	Unit Date 👻 .	Samplerate Duration Pri
	DFR 1 27.01.2000 01:11:46.744 .	🧠 100 Hz 1,15 s
	Total records: 1 (0 downloaded)	0 record selected (0 B)

To analyse a specific record, SHERLOG-Analysis can be started directly from the Online device dialog window

- Select the required record in the table of contents of the fault recorder
- Click the **Analyse** button

SHERLOG-Analysis is started and the fault record concerned is opened automatically.

10 User interface

The structure of the user interface is largely based on the Microsoft Fluent interface.

A ribbon with task-oriented tabs provides only those commands which are required for a specific task.

These features of the interface make for increased user-friendliness and intuitive operation; complex menu trees with multiple levels are avoided.

Basic knowledge of the Windows[®] operating system is a prerequisite for working with the software. Typical Windows[®] functions are not dealt with in this user manual.

10.1 Elements of the user interface



10.1.1 Ribbon

Record explorer	 Zoom al Reset Save as default 	Show as RMS	8. Arrange by +	Primary	⊻. Hide unchanged II Show band	Show band
3	Лени		Analog signals		Binary signals	Trigger signals
Direct Start	Analysis Graph	Data Configural	tion Yew			۵ 🍓 ا
Record Signal	 Q. Zoom al P. Reset The Same and default 	Show as RMS	San Arrange by +	별 Primary 볼 Secondary	 ✓. Hide unchanged ✓ Show band 	Show band
opiorer browser	mg bave as derault					
oplorer browser	New		Analog signals		Binary signals	Trigger signals
explorer browser	Analyss Graph	Data Configura	Analog signals Analyse Si abian View Se		Binary signals	Trigger signals

The ribbon is a multi-functional panel containing task-oriented tabs.

Tabs

The tabs are used to call up thematically organized groups of commands which are displayed on the ribbon.

Contextual tabs

In addition to the core tabs which are always displayed, some tabs are only available when the user selects a function which requires special options for its execution.



The functions and commands of individual tabs are described in the context of their use in the following chapters of this user manual.

User interface

10.1.2 Quick access toolbar

Start	Analysis Graph	Data Configurat	ion View			۵ 🍕
ecord plorer browser	 Zoom al Reset Save as default 	Show as RMS	Harrange by +	Primary	✓ Hide unchanged ✓ Show band	Show band
plorer browser	iii Save as default w	E Pundamental only	M Best Range	Secondary Secondary	IV Show band Binary signals	Trigger si
Q (1 ÷			Analyse			0 0
Q ⊡ ÷ atel Start	Analysis Graph	Data Configurat	Analyse tion View			0 0
Q Z =	Analysis Graph @ Zoom all	Data Configurat	Analyse bon View	Primary	🌋 Hide unchanged	C U C C C C C C C C C C C C C C C C C C
Q 2 =	Analysis Graph Q Zoom al P Reset Add to Quick Access	Deta Configurat	Analyse bon View E Arrange by +	Frimary	<u>✓</u> Hide unchanged <u>✓</u> Show band	□ U
Q 2 = Start Start Signal borer	Analysis Graph Q Zoom al P Reset Add to Quick Access Show Quick Access	Deta Configurat	Analyse bion View C Arrange by - C Best Range elog signals	Primary	✓ Hide unchanged ✓ Show band Binary signals	C C C C C C C C C C C C C C C C C C C

The quick access toolbar is always in the foreground (active). Users can customize this tool bar by adding favourite commands for quick access.

Adding commands to the quick access toolbar

Select the desired command by clicking it with the right-hand mouse button

A dialogue box for customizing the quick access toolbar is called up.

Choose Add to Quick Access Toolbar The command is displayed as an icon on the quick access toolbar and can be called up from there.

To remove commands from the quick access toolbar, use the right-hand mouse button to call up the remove command.

10.1.3 Task bar

	Ch	g on Iange passwori	Ь
	Sh	ow privileges	
Rea	idy	🚜 dsude 🗸	

List of administrator functions

Certain dialogue boxes and displays for managing users can be called up from here.

User interface

10.2 Customize the user interface

Datei St	art	Analysis	Graph	Data	Configuration	View	
Save view Delete view	Skin:			Langu	age:		(1) About
Restore view		Office 2010	Blue	EH2 E	nglish (United Kingd	om) 💌	License information
Screen layout				Iustomize			Help

Settings for the screen design and the language are made on the **View** tab. For more information, see under **First steps**.

10.2.1 Position additional windows



Using the mouse, the position and size of tools such as signal lists or the windows of analysis functions can also be changed manually.

The position can also be changed automatically with the docker function:

 Click the title bar of the docker window and drag it while keeping the left-hand mouse button pressed

A number of arrow icons are displayed for positioning.

Drag the window to one of these arrow icons and then release the mouse button

The docker window is positioned automatically.

10.2.2 Automatically hide additional windows





Additional windows can be hidden and or shown using the buttons at the edge of the monitor:

Click the **Auto hide** button

The window is hidden and a button for showing the window is automatically positioned at the edge of the monitor.

> Point to the button with the mouse pointer The window is shown.

11 Open records

11.1 Open from file system

D:			Analyse				-	= ;
Datei Start	Analysis Grap	oh Data	Configuration	View			\$	-
Save Save	Recent files							
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open 43	U22 0	6.11.1994 10:32	:19 • Schakamage 2	20 KV				
Cause Ba								
Dave AS								
Recently used	5							
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🔀 Exit								
						Recent	documents	
İffnen					3		1	? >
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SHERLOG event records (*.Evt) or records available in COMTRADE format can be opened from any storage location.

Click the Open from file system button

A file browser is opened for selecting the record.

11.2 Open from database

						BEEDE OIS
Datel Start Ar	nalysis Graph	Data C	Configuration	Vì	ew S	Settings
Save	Open Reco	ord				
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-	Name					
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Open Triggerdate Triggerdate Triggerdate TriggerdateLast Wee	terion Description	Filesize	View:	By date	• Monitored	comp
Triggerdate Triggerdate Triggerdate Triggerdate:Last Wee 01:11:24.125 DOR Triggerdate:Two Wee	terion Description k (1) DDR k Ano (5)	Filesize	View: Duration 0 kB 93003	By date	Monitored Sherlog CR	comp
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Coorn Fingerdate Triggerdate	erion Description k (1) GDR ks Ago (5) er Analogi tigger er Analogi tigger	Fiesze 17 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	View: Duration 0.148 93003 1.148 139 2.48 139 2.48 139 2.48 139 2.48 139 2.48 139 2.48 139 2.48 139 5.18 139 5.18 139	By data By data 3,33 ms 9,60 ms 9,20 ms 9,20 ms 9,20 ms 9,20 ms 9,20 ms 9,20 ms 9,20 ms	Monitored Sherlog CR Sherlog CR Sherlog CR Sherlog CR Sherlog CR Sherlog CR Sherlog CR Sherlog CR Sherlog CR	Comp Comp IX MJE IX MJE
Triggerdate • riggerdate • riggerdate • Triggerdate • • Triggerdate •	errion Description k (1) DR ks Ago (5) ger Analostrigger er Analostrigger	Féesize 12 8 8 8 8 8 8 8 8 8 8 8 8 7 7 7	View: Duration 0 k8 93003 1 k8 139 4 k8 139 4 k8 139 2 k8 139 2 k8 139 5 k8 139 5 k8 139 8 k8 139	By date By date 3,33 ms 9,60 ms 9,20 ms 9,20 ms 9,20 ms 9,20 ms 9,20 ms 9,20 ms 9,20 ms 9,20 ms	Monitored Sherlog CR Sherlog CR Sherlog CR Sherlog CR Sherlog CR Sherlog CR Sherlog CR Sherlog CR Sherlog CR Sherlog CR	Comp

Click **Open** to open records from the SHERLOG database.

The software displays the entire grid topology of the database in the form of a tree structure with all the measurement locations and all the connected measuring systems.

In the grid topology, the range of records to be displayed can be limited by clicking on the branch required.

All the records available for the selected branch are listed alongside the grid topology.

Open record:

 Select the required record and click the Open button or double-click the record itself.

Open records

11.3 Open several records

The analysis software allows the user to open several separate records at once and to superimpose or consolidate a number of records.

11.3.1 In a separate analysis window

NRGCenter What do you want to do with the record? Create a new window Load the second and create a new window. Add to active window Load the record and add it to the active window. Cancel Q 7 Analyse Datei Start Data Analysis Graph Configuration View Q Zoom all 10 -A Show as RMS Sarrange by * 🗮 Primary Seset 🕅 Best Range 🗮 Secondary Signa Bave as defaul alog signal 06.11.199 0:56:54.017 220 kV Switchge 20.11.1995 4:55.003 20 kV Busba A'AAA 93,47 kV ΛΛΛ Tab 1 Tab 2 86,61 kV AAAA 179,4 kV -376,

If a record is already open when another record is opened, the user can choose whether the records are to be displayed separately or whether they are to be superimposed.

The **Create a new window** function opens the record in a separate analysis window.

The newly opened record is added as a further tab in the analysis window.

Click the tabs to switch between records.

Each record can be grabbed with the mouse, removed from the current view and dragged to another screen, for example, once it has been accessed via the corresponding tab.

11.3.2 Superimpose records

NRGC	enter				X
Wh	at do you want	to do i	with the r	ecord?	
	Create a new Load the selected	v windo d record ar)W nd create a n	ew windov	<i>i</i> .
	→ Add to activ Loa	e windo and add it i	DW to the active	window.	Cancel
0				Analyse	
Datei	Start Analysis Grap	h Data	Configuration	View	
Record explorer View	Signal list View	Show as RMS Fundamental only	Sale Arrange by ~	Primery	 ✓. Hide unchanged ✓ Show band Binary signals
28 20 11	995 14:04:55 003 20 ky By Zurücksetzen				
Une 1 					VVI 13.280 V/V/V VVI 13.280 V/V/V VI 10.581 V/V/V VI 10.521 V/V/V VI 10.521 V/V/V VI 0.522 K2 VI 0.522 K2
Line 1	450				5,485 A

The **Add to active window** function superimposes the record to be opened on the currently displayed record.

Superimposition causes the individual records to be consolidated to form a new record which can be saved as a new event by clicking **Save as** on the **File** tab.

Open records

11.3.3 Synchronize superimposed records

Datei	Start	Analysis	Graph Da	ta Coni	iguration \
 Šite: Time: Trigger: Details 	n/a n/a n/a Selec	t Remove	Drag moo	e 0,00 ms onize	Measurement values
			ALL DR	na mode	
			0.00	ay mode	
			Time:	ay mode	0,00 m

Records which overlap in time are synchronized automatically on the basis of the trigger time points.

Manual synchronization

When the **Drag mode** button is activated, the records can be moved in relation to one another with the mouse.

Alternatively, a time correction can be entered. The records are displaced by the amount of time entered here.

11.3.4 Highlight or remove superimposed records

ĝ₿ Site: n/a	E	X Remove	🕑 Drag mor	de	
Time: n/a Trigger: n/a	Sele	🛁 Highlight	Time:	0,00 ms	Measurement
Details	11	20 kV Busbar 1995-11-20 1	r 4:04:54.8033		
Line 1 UL1N Gen		220 kV Switc 1994-11-06 1	hgear 0:56:53.8174]	(AAAAAA
Line 1		17A # 1-/A # 1- A	19.23	Δ -16.82 kV	ΔΑΑΑΑΑ

Especially if individual signals have been moved around in consolidated records, it can be useful to highlight all the channels of a specific record for identification purposes.

In order to do so, a record can be selected by clicking the **Select** button on the **Data** tab. The **Highlight** and **Remove** buttons affect the selected record only.

12 Display options for fault records

12.1 Best range display

Datel	Start	Analysis	Graph	Data	Configuration	Yow			* 🌏 .
Record xplorer View	Signal İst	200m all Reset Save as default View	A Show	as RMS mental only	Si Arrange b	y + 📙 Primary e 🗐 Secondar	Y Show band Binary signals	Show band Trigger signals	
3 06.11.19	94 18:32:19.0	017 Schaltanlage 220 ki	/ ×						
ne L z	200-		4,061 A			Δ.4,364.A			
e 1 13	200		20,35 A			Δ 15,13 A)			*****
éwik Keine	200-		**** *****	AAA	VAAAAA	1.4.94.50 AAA	ААЛААЛАЛ	ΑΛΛΛΛΛΑΑ	AAAA
e 1 J.3N	150 -	AAAA	SAMA/	AAA/	AAAAA	A 25,20 KY	AAAAAAAAAA	AAAAAAAA	AAAA
e 1 L2	300	~~~~ <u>e</u> .	229,5A	W		Δ 253,8 A			
e 1	200		253,0 A	Ŵ		4-206,6 A			
e 1 L2N	150 - 250 -	AAAAA	323 ky	AAAA	AAAAA	A 157,6 kg	VAAAAAAAA	WAAAAAA	VÁAA
e 1 ILIN Gen	250 -		35,8 kV}	WW	WAG	Δ -182,8 kv	AAAAAAAA	AAAAAAA	AW
utzanspra utzanspra	che R 1		0,00 ms		28	0.00 (0.124,20 ms)	Seelice		t/ms 750,00
unorietha	1					10			•

Click the Best range button

The scaling factor for the display of signal characteristics is automatically set to achieve an optimised display with maximum resolution.

12.2 RMS display

Datei	Start	Analysis	Graph	Data	Configuration	View			* 🍕
Record explorer View	ignal Ist	Soom all Reset Save as default View	Func	w as RMS amental only	G Arrange by	H Primary	✓ Hide unchanged ✓ Show band Binary signals	Show band	
06.11.1	994 18:32:	19.017 Schaltani	age 220 kv	x					
ut 1 UL 1N Gen	100	kv 📃	103	A 22,82 W					
ine 1 UL2N	100	kv 🗖	105	A 21,90 kV					
une 1 UL3N	100	kv 🔳	126	∆ 0,152 kV					
ine 1 IL1	0	^	19	<u>a -173,3 A</u>					
ine 1 IL2	200	^ •	17	Δ -153,2 A					
ine 1 IL3	200	^	18	∆ 0,065 A					
ine 1 E	200	A .	5,6	Δ-0,801 A					
Fehlerspa.	60	-		∆ 14,89					
chutzanspr chutzanspr chutzanspr chutzanspr chutzanspr	ache R 1 ache S 1 ache T 1 ache E ache N				•				+ / mo
		1	0,00	0 ms 4 89,96	3 ms 250,	100	500,000		750,000

Click the Show as RMS button

The signal characteristics are displayed as RMS values with optimised scaling.

12.3 Display primary or secondary values



- Click the **Primary** button
 The primary values are displayed at the measurement cursors.
 Primary values allow for the transformer ratios configured for sensors and transformers.
 - Click the Secondary button

The secondary values are displayed at the measurement cursors. Secondary values refer to the measurement signal at the input terminals of SHERLOG.

12.4 Show and hide binary channels

Datei Sta	Analysis Graph Data Configuration View 🗢 🍕	2
Record explorer View Signal	Bit Zoon all Store set RMS El: Anrarge by - K: Hele unchanged Store set defait Fundamental only Dest Range Store Set defait Were Store set defait Eles Range Store Set defait Non and all hele remotion Analog signals Tropper signals	
	2.15/01/ Schatalinge 220 M	-
E 200		il
Line 1 A • 11.3 200		
Default • Xeine 100		
Line 1 kv • UL3N 150		
Lins 1 A • 112 200	<u>2295</u> AAAAA	
Line 1 A 111 200		
Line 1 kv • UL2N 500		
Line 1 kv ULIN Gen 150		
Schutzensprache R 1 Schutzensprache 5 1 Snahschalter 19		
Spatischalter 20	1000 2000 2000 2000 7000 7000 4	

The display of the binary channel signals can be shown or hidden.

In the Binary signals group, select the Show band check box

The binary signals are displayed.

Activate the **Hide unchanged** button to display only those binary channels for which at least one change of state is registered during recording.

12.5 Show and hide trigger information

Datei	Start Analysis	Graph Data	Configuration View			* 🚯 🛔
Record explorer View	I Gli Zoom all Signal Ist I Save as defaul View	Show as RMS	Sill Arrange by * Primary Model Best Range Secondary Analog signals Finance Secondary	 ✓ Hide unchanged ✓ Show band Binary signals 	Show band	
3 ,20.11.15	995 14:04:55.003 20 kV Busbar	a 02.01.2014 11:07:33.2	70 Korbach 60.4 kVAC 68 uro PM ×			
Sammelschie ULIN SS	55	€ 63,50 kV	E 4-0010 KV			
Sammelschie • UL2N 55	n tv					
	59-	4 74,50 KV	■ <u>A-93,00 KV</u>			
Sammelschie	0 80					
	59	■ 63,50 kV	🔳 🛆 -0,011 kV			
Leitung 1 1 1 Spannung L2	0 A					
					1.0	

In the **Trigger signals** band, the type and duration of all the limit value violations which occurred during recording are displayed. This shows when and for how long which limit value was violated within the record.

The display of the extended trigger information by means of binary signal display can be shown or hidden.

In the Trigger signals group, select the Show band check box

12.6 Zoom functions

12.0	5.1	Window zoom								
9	Ŧ				Analy	se				
Datei	Start	Analysis	Graph	Data	Configuration	View				
Pecord	Signal Q	Zoom all Reset	A Show	w as RMS	Arrange by	• E Prim				
explorer View	list) Save as default View	Fund	amencai only	Analog signals					
20.11.19	995 14:04:55.003 :	20 kV Busbar 🗙								
UL1N Gen	₩ ₩	41	Marrie WA	WWWWW		wwwww				
Line 1 UL2N	30 -30	W	WHH .		www.www.	wwwwww				
Line 1 = UL3N	30 -30	ANNI MAMANA	₩ ₩	WWWWWWW	www.www.www	wwwww				
Line 1 E	30 - kV -30 -		₩₩₩	WWW.www	***************************************					
Line 1 IL1	2 WW	www.www.www	www		****	www.ww				

Use SHIFT + left-hand mouse button to drag open a zoom window around the area to be displayed

The selected area is zoomed to the maximum display size.

12.6.2 **Smart bars**





Use the left-hand mouse button to move > the sliders on the horizontal and vertical scroll bar

The zoomed area of the image is moved.

Position the mouse pointer on the ends of > the slider which are marked in grey

The mouse pointer takes on the form of a doubleheaded arrow and the left-hand mouse button can be used to operate the zoom.

12.6.3 Bird view (navigator)

3 D=			Analyse		-	= ;
Datei	Start Analysis	iraph Data Configuratio	n Wew		\$	-
f(i) Add signal	Phasors Harmonics Nyquist Diagrams	Fault details Fault Gatals Fault locator Fault locator	Une parameters		459 wigator	915
206.11.199	14 18:32:19.017 Schaltanlage 220 k	x				
ULIN Gen		135,8 M A -292,3 M	wwww	www.www.ww	MANNAN A	W
UC2N	🚆 🗛ѦѦѦѧ	19.23.14 0 _A : 16.82.14 1 AAAA				W
UC3N		153,8 M A 307,4 W	wwwww	mannanna	annannann	A-A
line 1 • Itt	4 bA	6,213 Mai 105 J- A		******		
Line 1 • IL2	4 54	0,230 kA				
Une 1 • IL3	4 24	0,026 kA 0,040 kA				
Line 1 • E	4 M	A (000 / A				_
■ Fehlerspa		A. 30 . A. 76 52 AAAA	WWWW	WWWWWW	MAMAAAAA	Ŵ
Schultzensprech Schultzensprech Schultzensprech Schultzensprech Schultzensprech	he R 1 he S 1 he T 1 he C he N					
frei		0,000 ms (1.89,963 ms)	zako	soupee	750,000	

The ribbon features a navigation window which provides an overview of the entire length of the record and the current cursor positions.



The navigation window is hidden if the window is not wide enough to display the groups of commands and the navigation window!

The (zoomed) time range currently visible in the analysis window is shown with a grey background in the navigation window. Via the grey area, the view can be moved and its size modified (zoomed) with the left-hand mouse button. The navigator can also be used to move the position of the measurement cursors.

12.6.4 Amplitude zoom of individual signal bands

						Analyse	Band			- 8 %
Datei	Start	Analysis	Graph	Data	Configuration	View	Einstellungen			a 🍕 👂
Record explorer	Signal list	 Zoom i Reset Save a 	al is default	Show	as RMS	🔠 Arrange	by - 🗎 Prim	ndary 🗹 Sho	: unchanged w band	Show band
View		View			A	nalog signals		Bina	ry signals	Trigger signals
20.11.19	95 14:04:5	5.003 20 kV B	usbar X							
Line 1 UL2N	30	J.		£4	AA	1.825 kV	VA	AAA		
UL3N	30	Ŵ	\mathbb{V}			-6,583 KV			$\sim \sim$	
ULIN Gen	23- - - - - - - - - - - - - - - - - - -	~	Ŵ	\mathbb{V}		21,53 ky) -				
ine 1 E	-30	<i>ï</i> A	A.A	jA-j		-3,757 kV			\sim	
ine 1 IL1	2 · · · · 2	*	w		AN9	-0,912 kA)		w	\sim	www
	-									

Using the mouse, the individual signal bands can be selected or moved and their amplitude magnified.

 Position the mouse pointer at the bottom edge of a band.

The mouse pointer takes on the form of a doubleheaded arrow and the signal band can be zoomed as required.

12.6.5 Edit the scaling factor and the offset of individual signals



Individual signals can be zoomed in on and moved within the band.

- Select a band
- The **Band** tab is displayed in the quick access toolbar
- Click the Band tab
- > The tab for editing bands is displayed
- Use the **Zoom** slider to set the scale of the amplitude within the band
- Use the Zero position slider to set the offset of the signal within the band

12.6.6 Undo zoom functions



> On the **Start** tab, click the **Reset** button The zoom functions carried out since the last time the view was saved are undone.

12.6.7 Move signals with the mouse

3 ÷	Shart	Analysis	Graph	Data	Configuration	Analyse	Find	Band
Record explorer View	Signal	Q Zoom a Reset Save a View	s default	A Show	as RMS	Arrange	a by +	Primary
20.11.	1995 14:04	:55.003 20 kV	Busbar >	E] NANANA	1111111111111	A.N. A.A.A.A.A.A.A.A.A.A.A.A.A.A.A.A.A.A	AAAAA	
Line 1	-30		NAAMA				1,82	<u>s kv</u> WWW
UL3N	-30	₩	₩₩₩		AAAAAAAAA	www.	-6,58	,¥v) ₩₩₩₩
ULIN Ge	n -30		₩₩₩	1A	₩₩₩₩	Ale wate	21,5	
Line 1 • E	30	kV			MMMMM	₩₩₩₩	AAAA -8,75 VVVVV	<u> </u>

() =						Analyse	1	tignal	
Datel	Start	Analysis	Graph	Data	Configurati	ion View	Eins	tellungen	
12		Q Zoom a		A Show	as RMS	🔠 Arran	ge by +	🗏 Prin	nary
Record explorer	Signal list	B Save as	s default	Funda	imental only	🛛 Best I	Range	🗎 Sec	ondar
View		View	_	-		Analog signa	als		
20.11.1	995 14:04:	55.003 20 kV I	Busbar >	¢					
Line 1 UL2N	-30	₩₩	WWW			₩₩	1 ,82		₩
Line 1 UL3N	-30	* - W	www		Www.	M	-6,58	i <mark>3 kV</mark> W	W
Line 1 UL1N Gen	-30	** #	₩₩₩	hvvAA	www	Manna			
Line 1 E	-30	kV			www.	MMM	1111 -8,75 VVVVV	AAAJ Z KV I AM	₩₩

Change the order of the signals

Select a band

shown in blue.

Keep the left-hand mouse button pressed and move the band to the required position When the band is moved, the insertion location is

Superimpose signals

To superimpose signals, several signals can be displayed in one band.

- Select a signal
- Keep the left-hand mouse button pressed and move the signal into another band

The target band is highlighted during the movement.

Separate superimposed signals

During the movement, position the mouse pointer between two bands so that neither of the bands is highlighted.

The selected signal is added as a new band.

Signal browser

13 Signal browser

٠	At	nalyse Signal browser		
Datel Start Analysis Graph	Data Configuration	View Settings		a 🍕 🤱
Record Star	Show as RMS	Arrange by * 🗮 Primary	 ✓ Hide unchanged ✓ Show band 	Show band
explorer brow they also ber aut	Aos	log signals	Binary signals	Trigger signals
3 ÷ Analyse		and Southnesse		- 0 X
Gale Start Analysis Graph Date	Configuration View End	selungen Enstelungen		a 🍕 🕻
Restore removed signals		15		
Sort by <default> User defined 1</default>				
User defined 2	94 18:32:19.017 Schakanlage 220 kV	ĸ		
Name Trigg Trigg Desc Signal list				ē ×
	Name Main ou	Help cur		-
V 🗖	Une LULIN Gen 34,49 kV	110,7 89		
V Bandi G	Line LUL2N -171,919	177,719		
✓ Band: 0:	Spannung UT Line I.JLSN 137.6 kV	-297.310		
~ Band: 0-	Strom IR	(and the second s		
✓ Band: 0:	Strom IS	0,013 ка		
✓ ■ ✓ Band: 0	Line 1.1L2 -0,032 kA Strom IT	0,005 kA		
V	Une 1.11.3 0,016 kA	-0,006 kA		
▼ Balan 0.	Line 1.Stron 00 0,000 kA	0,000 kA		
✓ Band: 01	Fehlerspannung U.R.S Default Fehlerspannung	-16,38 k		
✓ Band: Bi 2	nary signals			
2	Line 1.Schutzansprache			
× ×	Line 1.Schutzensprache			
×	Line 1.5chutzerepreche N	0		
	Che tate	<u>v</u>		
Signalliste				
Ziehen Sie eine Spaltenübe	rschrift in diesen Be	reich, um nach dieser z	u aruppieren	
			5	
Name	Aufzeich	AL Aufsteigendis	ortieren	CItfeld
🔝 Line 1.UL 1N Gen	#0	Z‡ Auisteigenu s	onteren	1
Line 1.UL2N	#0	Absteigend so	ortieren	1
Ine 1.U.3N	#0	Sortierung ent	fernen	1
The Line 1 BusBar V Volu	#0			
	age #0	😬 Nach dieser S	palte gruppiere	n ¹
Line 1.IL1	#0	💾 Gruppierungs	feld ausblende	n 1
🔝 Line 1.IL2	#0	Spaltenauswa	hl	1
🔝 Line 1.IL3	#0	C Ontimale Snal	tenbreite	1
Line 1, 301 KOE (SUE	#0	H Optimale spal	tenoreite	1
The 1 102 KOE (100	#0	Optimale Brei	te (alle Spalten)	
	···· === #U		bindi y si ivei	IC LINE 1

On the Start tab, click the Signal browser button.

The signal browser is called up.

The signal browser shows all the analog and binary channels of the record as well as their measuring ranges or states at the cursor positions.

User-defined views

Two user-defined views can be saved and called up in the **View** group.

When one of these user-defined views is called up, a right-click on the column heading opens a context menu in which the view can be defined.

14 Analysis functions

				Analyse			Sigr	-	۰	23
Datei	Start	Analysis	Graph	Data	Configuration	View	Setti	ngs 🌣	-	8
f (t) Add signal	Phasors	Harmonics	Nyquist plot	Fault	Highlight Show call Signals	faults culated sig	nals •	Line para	meters	
		Diagrams			F	ault locate	r			

All the analysis functions can be called up from the **Analysis** tab

14.1 Use mathematical calculations to add signals to fault records

A formula editor can be used to make further mathematical calculations within fault records. The results can be added to the fault record as an additional signal.

۹ 🗧	Analyse		Sigr	
Datel Start Analysis	Graph Data	Configuration	/iew Settir	ngs 🗠 🬏 🤱
f() Add signal Phasors Harmonic Diagram	s Nyquist plot summary	Highlight fau Show calcula V Y Signals Fault	lts red signals * locator	Line parameters
Add signal 94 18:32:19.017 5c	naltanlage 220 kV 🛛 🗶			Ŧ
New expression				8
Lines:	Available functions:			
<nore></nore>	Apparent power Reactive power System L1 L2 L3	~		•
Expression Q_Sum(Q(Line_1.UL1, Line_1 Line_1.IL3))	IL1), Q(Line_1.UL	2, Line_1.IL2),	Q(Line_1.UL	3, Calculate Clear
Preview Properties				
25-				
0 4	250,000	500,	000	1/ms 750,000
Save as template Copy to C	lpboard	Add		OK Cancel



On the Analysis tab, click the Add signal button

The **New expression** window is called up **Automatic**

This tab makes available those calculations which automatically result from the signal types and phase allocations of the channels in the record which is open at the time. For example, if the phase reference between current and voltage channels is defined in the record, the calculation formulae for power which can be derived from the phase reference are offered directly.

Template

Using the **Save as template** button, individual formulae can be saved in the template for later use.

Functions

Users themselves can define all kinds of virtual channels with the aid of the functions provided. Access is given to mathematical functions, formulae for signal analysis (unbalance, frequency, harmonics etc), constants and all the channels in the record which is currently open.

14.2 Vector analysis

Power systems which exist in the record (e.g. a line or a bus bar) can be displayed with their value and phase angle in the form of a vector diagram. Any number of vector diagrams can be opened; the view can be set individually for each one.



 3
 3
 Analysis
 Viettor slopgram
 Image: Setting Seting Setting Setting Setting Setting Setting Setting Setting Sett



On the Analysis tab, click the Phasor button.

The vector diagram is called up.

In addition to the graphical display, the signals displayed in the vector diagram can also be displayed numerically in table form.

The vector diagram displays the values corresponding to the current position of the main and/or help cursor.

The reference quantity in the diagram is always the voltage of phase 1 with the phase angle 0°. The direction of rotation is to the left (mathematically positive) so that a phasor at 90° has a 90° lead on voltage UL1.

The functions available for the vector diagram are displayed in the ribbon.

If more than one vector diagram is open, the functions are applied to the diagram which is currently selected.

The signals to be displayed can be selected in the **Data source** group.

The cursor for which a vector diagram is to be shown can be specified in the **Assignment** group.

The vector labels can be shown/hidden in the **Diagram** group.

The table view can be edited in the **Vector table** group.

14.3 Harmonic analysis

Harmonics can be displayed in a bar chart for analysis. Any number of bar charts can be opened; the view can be set individually for each one.



On the Analysis tab, click the Harmonics button



Signals: U1;U2;U3
Cursor Main cursor
Data source

Show values	🗹 Logarithmic scale			
_	Absolute	Harmonics:	DC; H2; H3; H4;	•
Show legend	Show harmonic numbers			
	View			

Periods:	monics amental	1
	Mode	
Harmonics reference		23
 Fundamental True RMS User defined Type 		
Voltage		0,000 V
	ок	Cancel

The bar chart for the analysis of harmonics is displayed.

The measurement value of each of the harmonics can be displayed numerically beneath the chart.

The functions available for harmonic analysis are displayed in the ribbon.

If more than one bar chart is open, the functions are applied to the chart which is currently selected.

The signals to be displayed can be selected in the **Data source** group.

It is also possible to specify which of the cursors is to be used for the analysis.

The chart view can be edited in the **View** group and the user can select the harmonics to be displayed. Which harmonics are available depends on the sampling rate of the record which is to be analysed.

Mode

Periods:

It is possible to define the number of periods used for the calculation of the harmonics. The calculation window is arranged symmetrically around the selected measurement cursor.

If the calculation is carried out across a number of periods, it is possible to show the resulting interharmonic signals.

Reference:

The following options can be chosen as the reference for the calculation of harmonics.

Fundamental:

RMS value of the system frequency component

Whole signal: RMS value of the whole signal: TrueRMS

User-defined value:

Freely configurable value, e.g. for the calculation of harmonics with reference to defined rated values (Total Demand Distortion).

Analysis functions

kV,%	RMS	THD	THDG	THDS	PWHD
L1	103,5	1,04			1,67
L2	104,9	1,17			2,50
 B 	126,3	1,26			1,02

In addition to the RMS value of the whole signal (**RMS**) and the total harmonic distortion (**THD**), the **Legend** displays the following quantities in accordance with IEC 61000-4-7.

THDG --> Group distortion

THDS --> Subgroup distortion

PWHD --> Partially weighted distortion

14.4 Nyquist plots

Recorded signals can be displayed in a Nyquist plot.



14.5 Fault location

The method implemented for fault location is based on the fact that the imaginary part of the impedance (reactance) of an electrical high-voltage line is proportional to the length of the line and independent of the arc resistance and the arc base resistance. This means that if the abovementioned line parameters are known, the fault location can be inferred from the characteristic of the fault current and voltage (conductance method).

To ensure that sudden, large variations in the load are not identified as faults, the starting threshold for the fault locator can be defined individually for the phase and neutral currents using overcurrent factors.

14.5.1 Set line parameters

For SHERLOG CRX measuring systems

The parameters which are required for fault location, such as line impedances, capacities, coupling to parallel lines, starting thresholds etc are set in the device configuration (Electrical environment) of SHERLOG CRX and automatically belong to every fault record. However, the analysis software also offers the options of entering or editing line parameters subsequently during analysis. This is necessary when, for example, fault location is to be carried out for consolidated fault records made by various different SHERLOG CRX devices.

For individual records

If a record from an external device such as a protection relay is available as a COMTRADE file and is to be analysed, the line parameters can be entered in the analysis software.





A window is opened with the line diagram identified from the record. In the case of imported COMTRADE records, automatic assignment is not always possible, depending on the execution, and bus bars and/or lines must be added manually using the buttons.

Click the info boxes next to the icons for current and voltage transformers to open the window for setting the channel allocation and the transformer ratios

Setting for a current transformer with channel allocation

Instrument	transformer: Line cu	rrent		23
	Р	Primary	1,00 A	•
) <u>5</u>	Secondary	1,00 A	*
		Connection	Three-phase	-
📃 Calcu	ilate sum current			
Line 1.IL	1:	1: Strom IR		-
Line 1.IL	2:	2: Strom IS		-
Line 1.IL	3:	5: Strom IT		•
			OK Cancel	

Analysis functions

g for a voltage transformer with el allocation
g for a voltage transformer with el allocation
g for a voltage transformer with el allocation
g for a voltage transformer with el allocation
ne line diagram has been fully configured, propriate line parameters can be assigned Line tab.
ł

Analysis functions

D:	Line 1		Bus:	<none></none>	*	
escriptic	on:		Type:	3-phase/3-wire	Ŧ	
Scheme	Signals Line Faul	t analysis				
lated cu	ment: 0,000 A			ine length: 500,00	km	
U	$n = \frac{1}{k^{0s \times Z^{1s}}}$		F1	$r = \frac{Re}{R1} = \frac{1}{3} \left(\frac{R0}{R1} - 1 \right) Fr$ $r = \frac{Ze}{71} = \frac{Re + jXe}{R1 + jY1} = \frac{Fr}{1}$	$x = \frac{Xe}{X1} = \frac{1}{3} \left(\frac{X0}{X1} - 1 \right)$ $\frac{\times R1 + jFx \times X1}{R1 + jX1}$)
Param	eter format			<u> </u>		
Param Format:	eter format Magnitude & Angle	-	Absolut	e values		
Param Format: Line im	eter format Magnitude & Angle spedance	* *	Capacitar	e values		2.46/1m
Param Format: Line im Z1L':	eter format Magnitude & Angle ipedance 0,50 Ω/km ∠	*	Capacitar Capacitar C1L':	e values ce 0,00 uF/km	CO1': 0,0) uF/km
Param Format: Line in Z1L': Zero s	eter format Magnitude & Angle spedance 0,50 Ω/km ∠ equence system	× 85;00 °	Capacitar C1L': Parallel lin	e values ce 0,00 uF/km e coupling	cot': 0,0) uF/km
Param Format: Line im Z1L': Zero s Model:	eter format Magnitude & Angle pedance 0,50 Q/km ∠ equence system Line impedance	*	Capacitar Capacitar C1L': Parallel lin Z0M':	e values ce 0,00 uF/km e coupling 0,00 Ω/km ∠	COI1: 0,00 0,00 °) uF/km
Param Format: Line in Z1L': Zero s Model: 20L':	eter format Magnitude & Angle pedance 0,50 Q/km ∠ equence system Line impedance 0,50 Q/km ∠	* 85,00 * * 90,00 *	Capacitar Capacitar C1L': Parallel lin ZOM': Line:	e values ce 0,00 uF/km e coupling 0,00 Ω/km ∠ (<none></none>	CO1': 0,00 0,00 °) uF/km
Param Format: Line in Z1L': Zero s Model: 20L': k0L:	eter format Magnitude & Angle pedance 0,50 Q/km ∠ equence system Line impedance 0,50 Q/km ∠ 0,00 ∠	* 85,00 ° 90,00 °	Capacitar Capacitar C1L': Parallel lin Z0M': Line: Mode:	e values ce 0,00 uF/km e coupling 0,00 Q/km 	CO1': 0,00 0,00 °) uF/km
Param Format: Line in Z1L': Zero s Model: Z0L': k0L: Fr:	eter format. Magnitude & Angle pedance 0,50 Ω/Im 4 ∠ equence system Line impedance 0,50 Ω/Im ∠ 0,00 ∠ 0,00 0,00	* 85,00 ° 90,00 °	Capacitar Capacitar C1L': Parallel lin Z0M': Line: Line: Channel:	e values ce 0,00 uF/km e coupling 0,00 S/km ∠ <none> Recorded sum current</none>	C01': 0,00 0,00 °) uF/km

Propterties						
ID:	Line 1		Bus:	<none></none>	-	
Description:			Type:	3-phase/3-wire	-	
Scheme S	Signals Line	Fault analysis				
Rated currer	nt: 0,0	00 A	Lin	e length: 500,00 km		

Set line parameters for a power system

- Switch to the Line tab
- > Enter the rated current and the line length
- Choose the entry format

Z1L: positive-sequence impedance, essential.

Z0L: zero-sequence impedance, essential.

C1L: line capacity, optional.

ZOM: Required for parallel lines.

Enter starting threshold for fault location > Switch to the Fault analysis tab

The starting thresholds for the phase-phase and neutral currents are set as factors in relation to the rated current entered in the line parameters. If the resulting overcurrent is reached within a fault record, fault location is automatically carried out for the time range concerned.

14.5.2 Carry out fault location

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Fault location is automatically carried out for every record which is open using the configured line parameters. Different display functions are available for the graphical and numerical evaluation. These are described in detail below:

Fault details

) =							Analyse
	Start	Analysis	Graph	Data	Configuration	View	
f (t) Add signal	Phasor	s Harmonics	Nyquist plot		Highlight fa	ults ated signals *	Line parameters
		Diagrams		10	Fau	It locator	

Fau	lt details					οx	
Тур	e	Location			Duration		
ΞL	1L2		477,93 km				
	Fault						
	Туре					L1L2	
	Location				47	7,93 km	
	Duration					98,8 ms	
	Fault impedance						
	Z					502,4 Ω	
	Phi					72,0 °	
	R					155,0 Ω	
	X					477,9 Ω	
	Phase values						
		L1	L2	L3	E		
	U 10	5,7	111,9	126,8		kV	
	I 184	,85	166,62	17,83	1,50	A	
	I Max 194	,22	174,84	22,91	4,19	A	

\geq	On the Analysis	ta

On the **Analysis** tab, click the **Fault details** button.

A window is displayed with detailed information on every fault identified in the record, including the fault type, fault impedance and distance-to-fault.

Highlight faults

Souls Analyse

> Click the **Highlight faults** button

Colour is used to highlight those areas in which faults have been identified and for which the data for the **Fault details** has been calculated.

Datei	Start	Analysis	Graph	Data	Configuration	View	Settings
f (t) Add signal	Phasors	Harmonics Diagrams	Nyquist plot	Fault summary	Highlight	faults Ved signal: ault locator	s Line parameters
20.11.19	95 14:04:55.	003 20 kV Bus	bar 🗙				
Line 1 UL1N Gen	30	-2,125 kV	9 m 124			AMM W	
Line 1 UL2N	30	X ∧ ∧ ∧ ∧ ∧ ∧ ∧ ■ 16,03 kV				HHHHA	
Line 1 UL3N	30 -	25,50 kV		₩	••••••••••••••••••••••••••••••••••••••	wwww	WWWWWWWW
Line 1 E	30	■ -21,15 kV		₩ ₩ ₩₩₩₩₩₩			MMAMMM
Line 1 IL1	3	A 1,239 kA	www.	₩ <mark>■ <u>Δ</u>-2,29</mark>		wwww	
Line 1 IL2	3 -2	A 0,057 kA 00000000	www	M B+ 8/25		AVVAAAVV	wwwwwww
Line 1 • IL3	3	A ■ -0,480 kA /VVVVVVVV	www	W	SKA WWWW	wwww	www.www

Analysis functions

🔕 🛛 🕫 Datei	Start Analysis	Graph	Data	Configuration	View	Foul: Settings	Analyse
f(t) Add signal	Phasors Harmon Diagran	ics Nyquist plot	Fault summary	Highlight fa	Line parameters		
20.11.1995	5 14:04:55.003 20 kV Bus	bar 🗙					
Line 1	· www.	VVVV-9 m	s > < 124 ms	wwww	MAAA	371 ms 5	504 ms
Line 1	• MAAAA	AAAAAA	AAAAA	AAAAAAA	AAAA	MAAA	AAAA
Line 1	• NAAAA	AAAAAA	AAAAA	AAAAAA	~~~~	AAAA	AAAAA
Line 1	0 - W		AAAAA	AAAAAAA	AAAAA	AAAAA	AAAAA
Line 1	kA	00	00000	0000000			
Line 1		100000	00000	000000000	100004		00001
112	0-43444444	www.	AAAAA	wwwww		AAAA	ANA
13	0-2000	www.	~~~~~		www	Anno	-
						1	
Default ■ Diff	· · · · · · · · · · · · · · · · · · ·					-	
 Feh 	-100 -						
Default	20 -						
Default	° - 0						
Default	5-0					and	
Default	250 Ω						
 Feh Default 	s_ka	M.					

Data

E.

Fault

C,

Harmonics Nyquist

Configuration

V Signals

Show calculated s

-

Line parameters

Start

 $\langle \rangle$

🔽 Fault distance

fa

Add signal

Analysi

Show calculated signals

Select the Show calculated signals check box

This function supplements the fault record with mathematical signals calculated automatically within the scope of fault analysis.

The values to be displayed can be selected on the **Fault/Settings** tab. See below for more information.

Fault/Settings tab

Click the Fault button

The functions for fault analysis are displayed in the ribbon.

The distance-to-fault and the fault duration of the fault area selected in the record are displayed in the **Details** group.

The **Fault type** and **Fault loop** parameters used for fault location are displayed in the **Characteristic** group. They can be edited manually if required.

When the **Lock** check box in the **Interval** group is cleared, the time range for the calculation of the fault location can be edited manually. To do so, use the mouse to move the left-hand or right-hand edge of the time range which is marked in colour. Afterwards the fault data is automatically recalculated and displayed.

In the **View** group, the user can select which mathematical channels of the record are to be displayed when the **Show calculated signals** button is clicked.

Line: Line 1 Distance: 477,93 km Duration: 98,8 ms Details 🚴 Fault type L1L2 * Fault loop L1L2 × Reset Characteristic 15 🔽 Lock 🔄 Reset Interval f(t) Fault signals: Fault voltage... 📝 Fault voltage 🗹 Fault current 🗹 Phase angle 📝 Fault resistance 📝 Fault reactance 📝 Fault impedance Standard deviation
15 Create fault reports

15.1 SHERLOG report function

The SHERLOG report function can be used to create fault reports and print them out directly or save them as a file.

3.6 Start Analysis	Graph Data Configuration View Setting	5					A 6
🚽 Sava 🊰 Open from file system	Printer English English	-	Preview				
Upen Save As Recently used				Fault report for:		Tripper information:	
	Printer	-		Station: Bay: Recorded by:	Schaltanlage 220 kV	Recording date: Trigger time: Trigger criteria: Priority:	06.11.199 18:32:19.0
sport N	- Content		Progression Graph				
ganap g gan	E Demenvalue relations, Browy Creet Samony Consort Consort			Line 1 Line 1 • U.2N Line 1 • U.2N Line 1 • U.2N			~~~√ ∕~∕~
	• Graphic			• 3.1			
	Content			Une 1	4 14	-	
	Colored print-out Dise RMS Values Print Cursor Scale to Dest Range Print Fault Ranges Vinte Fault Ranges Vinte Fault Ranges	6		• 12 Lite 1 • 13	4 * 1A		
	© Current Layout		4	ing a state			

> On the File tab, click Report

A window for setting the report parameters, such as language, output (printer or file), content, formatting etc. is called up.

The preview window is automatically updated after every change.

 Start report output by clicking the Printer/File button

15.2 Create customized reports

For the creation of customized reports, all graphs and tables of results can be copied to other Windows applications as vector graphics using the Windows clipboard.



Copy graphs with the Windows clipboard:

- Switch to the **Graph** tab
- Click the window which is to be copied
- Click the Copy to clipboard button

16 Data export and import



All export and import functions can be accessed in the **File** menu under **Save as**.