SHERLOG CRX.

SPECIFICATIONS

General description

SHERLOG CRX is a modular, multi-functional measurement and analysis system for comprehensively monitoring and assessing equipment in electricity supply systems. It combines the monitoring functions of high-resolution digital fault recorders, power quality analysers, phasor measurement units, continuous data recorders and event recorders in one device.

Individual devices can be networked via an Interlink interface to monitor extensive installations.

Multi-processor system	Digital signal processor (DSP) for processing signals and processes in real time Communication processor for mass data storage, simultaneous data communication using different interfaces and protocols, web server functionality and stand-alone operation
User controls and displays	8 status LEDs for alarm, trigger and status display 3.5" colour graphical display with touch screen and 4 function keys
Number of measurement inputs	8…32 analog inputs 0…128 binary inputs
Data memory	32 GB flash RAM for reliable data storage
Quality system	Developed and manufactured to DIN ISO 9001
Calibration	Software-controlled calibration Calibration data is saved on the individual measurement modules No calibration required after module replacement or upgrade (plug & play) Recommended calibration cycle: check every 5 years
Operating software	SHERLOG operating software for Windows 7, Windows 8.1 (32 and 64 bit), Windows 10 (32 and 64 bit), Windows Server 2012 R2

Function overview

Recording functions	Digital fault recorder, 2 sampling rates from 500 Hz…30 kHz RMS fault recorder, sampling rate from 1 Hz...120 Hz Continuous data recording Event data recording Power quality analyser, class A (optional) Phasor measurement unit/PMU (optional)
Standards for measurement and analysis	IEC 61000-4-30 class A IEC 61000-4-7 harmonics and interharmonics IEC 61000-4-15 flicker EN 50160, IEEE 519, IEEE 1159 IEEE C37.118

Analog inputs	General information	Resolution	16 Bit, S/R:92 dB typical
		Sampling frequency	200 kHz per channel
		Accuracy	0.05% of range
		Protection	Galvanic isolation Channel-channel: 2.5 kV; channel-device: 2.5 kV
	Input module Type 1	Number of measurement inputs	8 inputs with selectable measuring ranges for: Voltage measurement Current measurement with external sensors (e.g. shunts) Measurement of low-level signals
		Measuring ranges	Each measurement input has 4 selectable measuring ranges: Measuring range 1: 300 VAC / ±424 VDC; impedance 6.6 MΩ Measuring range 2: 700 mVAC / ±1000 mVDC; impedance 14.7 kΩ Measuring range 3: 200 mVAC / ±282 mVDC; impedance 14.7 kΩ Measuring range 4: ±20 mA / 4…20 mA; impedance 10 Ω
		Overload	1000 VAC sustained in the 300 V measuring range
		Frequency range	DC…10 kHz
	Input module Type 2	Number of measurement inputs	4 separate high-current inputs for connection to protection or instrument transformers
		Measuring ranges	Each measurement input has 3 selectable measuring ranges: Measuring range 1: 10 AAC; impedance 0.002 Ω Measuring range 2: 40 AAC; impedance 0.002 Ω Measuring range 3: 200 AAC; impedance 0.002 Ω Measurement of small signals e.g. up to ±20 mA or ±100 mA possible via measuring adapter plug.
		Overload	40 AAC sustained 200 AAC for 5 seconds 500 AAC for 1 second
		Frequency range	10 Hz…10 kHz
Binary inputs	Input module	Number of measurement inputs	16 inputs per module Galvanically isolated in 4 groups of 4 inputs Max. 8 input modules (128 inputs)
		Activation range	24…300 VDC (wide-range inputs)
		Resolution	0.1 ms
		Protection	Transient protection Polarity protection Galvanic isolation up to 2.5 kV
Binary outputs	Electronic relays	Number	2, freely configurable for status and alarm signals
		Switching capacity	Max. 60 VAC/DC, 200 mA
	Mechanical relays	Number	8, freely configurable for status and alarm signals
		Contact type	Potential-free relay contact Configurable as NC or NO contact
		Switching capacity	Max. 220 VAC, 8 AAC, max. 60 W, max. 500 ms Max. continuous current: 2 AAC Required fuse: 2.5 A slow blow

Time synchronisation	Standard equipment	Internal real-time clock	Accuracy 2.5 ppm without external time synchronisation
		NTP/SNTP	Synchronisation over Ethernet network
		Interlink interface	Master-slave time synchronisation between several SHERLOG CRX devices
	Synchronisation module (optional)	GPS receiver	Internal GPS receiver with SMA antenna connection Accuracy of internal seconds pulse: <60 ns
		Optical GPS input	For connection to external GPS systems over optical fibre (2 x ST II) Time telegram: NMEA-0183-RMC, 4800 baud, non-inverted Pulse input: seconds or minutes pulses, non-inverted
		DCF 77 input	DCF 77 pulse telegram input for connection to external clock systems or to the KoCoS DCF 77 antenna module
		Pulse input for seconds or minutes pulses	PPS/PPM impulse input 5…12 V / 24…80 V , min. pulse width 5 ms
		IRIG-B signal input	Coaxial connection for B001, B002 and B003 telegrams
Interfaces	Standard equipment	Data communication	2 x RS232, 1 x RS485 2 x USB-A, 1 x USB-B 3 x 10/100 Mbit Ethernet (RJ 45) 2 x 10/100 Mbit Ethernet SFP
		Interlink interface	Interface for trigger forwarding and master-slave time synchronization between several SHERLOG CRX devices 1x electrical 2-wire interface (up to 500 m) 1x optical interface with LC connector (up to 2000 m)
	Protocols	Standard: TCP/IP, Modbus TCP, IEC 60870-5-103, GSM, GPRS Optional: IEC 61850, IEEE C37.118 (PMU)	
Power supply	Operating voltage	Type 1: 90…365 VDC and 85…265 VAC; 47…63 Hz Type 2: 9…18 VDC Type 3: 18…36 VDC Type 4: 36…72 VDC Working range: +6% / -10% of the nominal range	
	Power consumption	Max. 30 VA with maximum configuration (32 analog and 128 binary inputs)	
	Redundancy	Power supply unit and power supply redundancy provided by accommodation of up to two independent power supply modules of the same type or of different types	

Complete system	Mechanical properties	Weight	2.9 kg
		Housing	19" housing for rack mounting, 84 HP/3 U
		Protection class	IP 52 (front panel)
		Dimensions	483 mm x 132.5 mm x 263 mm
	Environment	Storage temperature	-20…70 °C
		Maximum temperature limit	-5…55 °C, minimum switch-on temperature 0 °C
		Relative humidity	5…95%, non-condensing
		Other	RoHS-compliant
	Generic standards	Safety	EN 61010-1
		EMC emissions	EN 61000-6-4 (replaces EN 50081-2)
		Susceptibility	EN 61000-6-2 (replaces EN 50082-2)
	Measurement category		300 V CAT III, 150 V CAT VI
EMC standards	IEC 60255-1		Measuring relays and protection equipment - Part 1
	IEC 60255-5	IEEE C37.90	Dielectric test, 2.5 kV, 50 Hz Insulation test, 500 V, 50 Hz Impulse voltage test, 5 kV, 0.5 Joule
	EN 55011	CISPR 11 CISPR 16 CISPR 22	Radiated radio disturbances 30…230 MHz at 10 m, 40 dB (µV/m) 230…1000 MHz at 10 m, 47 dB (µV/m)
	EN 55011	CISPR 11 CISPR 16 CISPR 22	Conducted radio disturbances 0.15…0.5 MHz, 79 dB (µV) Q, 66 dB (µV) A 0.5…5 MHz, 73 dB (µV) Q, 60 dB (µV) A 5…30 MHz, 73 dB (µV) Q, 60 dB (µV) A
	IEC 61000-4-2	IEC 60255-22-2	Electro-static discharge test, class 4 8 kV contact, 15 kV air
	IEC 61000-4-3	IEC 60255-22-3	Radiated susceptibility 10 V/m, 80…3000 MHz, AM 10 V/m, 900 MHz, PM
	IEC 61000-4-4	IEC 60255-22-4 IEEE C37.90.1	Electrical fast transient burst 4 kV, 2.5 kHz, 5 kHz, 100 kHz
	IEC 61000-4-5	IEC 60255-22-5	Surge test, class 4 4 kV common mode 2 kV differential mode
	IEC 61000-4-6	IEC 60255-22-6	Conducted susceptibility 10 V, 150 kHz…80 MHz
	IEC 61000-4-8	IEC 60255-6	Power frequency magnetic field 30 A/m, 50 Hz, x, y, z axis
	IEC 61000-4-11	IEC 60255-11	Supply voltage dips and interruptions, class 3
	IEC 61000-4-18	IEC 60255-22-1	Damped oscillatory waves 2.5 kV, 1 MHz common mode 1.0 kV, 1 MHz differential mode
Vibration Standards	IEC 60068-2-6	IEC 60255-21-1	Vibration test 5.2 g, 5…55 Hz, x, y, z axis
	IEC 60068-2-27	IEC 60255-21-2	Vibration test 5 g / 11 ms, x, y, z axis
Climatic standards	IEC 60068-2-1		Cold storage test Storage at -45 °C for 96 hours Operation at -5 °C for 16 hours
	IEC 60068-2-2		Cyclic temperature test, dry heat 16 hours, 55 °C, operating condition 96 hours, 70 °C, power off condition