HELIOS
POWER SOLUTIONS

POWER QUALITY ANALYZER
PQM-703 / PQM-702

PQM-703 Transients measurement upto 6000 V

CAT IV 600V

IP 65

GPS

GSM

OR-1

HEAVY DUTY -20 ℃ + 55℃

PQM-703:

TRANSIENT max. 10MHz. **RECORDER**

ANALYZER MEASURES AND RECORDS ACCORDING TO THE IEC 61000-4-30

CLASS A
STANDARD

- power to the analyzer is supplied from tested mains (internal power supply) and is used in all types of networks from 64 V to 760 V, with particular emphasis on measurements at low voltage poles, due to the ease of connection.
- has an independent power supply socket, especially suited for voltage measurements for transformers and DC circuits.
- remote control and data transfer through a built-in GSM modem (GPRS),
- anti-theft feature - SMS notification in the event of position change - built-in GPS receiver
- real-time clock synchronized to GPS protocol.

Possible measurements:
- Measurements according to EN 50160,
- Voltage L1, L2, L3, N-PE,
  - average, minimum, maximum and instantaneous values, range to 760 V, ability to work with voltage transformers,
- Current L1, L2, L3, N (four inputs),
  - average, minimum, maximum and instantaneous values, measurement current with range to 3kA (depends on used clamp), ability to work with current transformers,
- Crest factor for voltage and current,
- Frequency from 40 Hz to 70 Hz,
- Active, reactive, distortion, apparent power, including the type of reactive power (capacitive, inductive)
- Power recording
  - Budeanu method,
  - IEEE 1 459,
- Active, reactive, apparent energy
- Power factor, cos φ, tg φ,
- K factor (transformer overload caused by the harmonics),
- Up to 50th harmonics for voltage and current,
- Total Harmonic Distortion (THD) for voltage and current
- Short-term (P_{ST}) and long-term (P_{LT}) flicker,
- Unbalance of voltage and current,
- Current events detection including waveforms recording
- Current and voltage events recording with waveforms (up to 1s) and RMS 10 ms graphs with 30 s maximum recording time,
- Current and voltage waveforms recording after each averaging period,
- Mains signaling up to 3000 Hz,
- Transients up to ±6000 V with max. sampling frequency 10 MHz. Minimal transient time is 650 ns (PQM-703 only).

The device is designed to work with networks
- with nominal frequency 50/60Hz,
- with nominal voltage:
  64/110 V; 110/190V; 115/200V; 127/220V; 220/380V; 230/400V; 240/415V; 254/440V; 290/500 V; 400/690V.
- DC network

Supported networks:
- single-phase,
- two-phase with common N conductor,
- three-phase star connection with and without N conductor,
- three-phase delta

Parameters of analyzer PQM-702:

Parameter		Measurement range	Max. resolution	Accuracy
Alternating voltage (TRMS)	—	0.0…760 V	0.01 % U_n	±0.1% U_n
Crest factor	Voltage	1.00…10.00 (≤1.65 for 690 V voltage)	0.01	±5%
	current	1.00…10.00 (≤3,6 I_{nom})	0.01	± 5% m.v.
Alternating current TRMS	—	depending on clamp*	0.01% of nominal range	±0.1% of nominal range (error does not account for clamp error)
Frequency	—	40.00...70.00 Hz	0.01Hz	±0.01 Hz
Active, reactive, apparent and distortion power	—	depending on configuration (transformers, clamp)	up to four decimal places	depending on configuration (transformers, clamp)
Active, reactive apparent energy	—	depending on configuration (transformers, clamp)	up to four decimal places	as power error
cosφ and power factor (PF)	—	0.00...1,00	0.01	±0.03
tgφ	—	0.00...10.00	0.01	depends on active and reactive power error
Harmonics and interharmonics	Voltage	as for alternating voltage True RMS	as for alternating voltage True RMS	±5% U_h for U_h≥1% U_n ±0.05% U_n for U_h<1% U_n
	Current	as for alternating voltage True RMS	as for alternating voltage True RMS	± 5% I_h for I_h≥3% I_n ± 0.15% I_n for I_h<3% I_n
THD	Voltage	0.0..100.0% (in regards to the rms value)	0.1%	±5%
	Current			±5%
Active and reactive power of harmonics	—	depending on configuration (transformers, clamp)	depending on minimal current and voltage values	—
Angle between current and voltage harmonics	—	-180.0…+180.0°	0.1°	±(h x 1°)
K- factor	—	1.0...50.0	0.1	±10%
Flicker severity P_{ST}, P_{LT}	—	0.20...10.00	0.01	±5%
Voltage asymmetry	Voltage and current	0.0...20.0%	0.1%	±0.15% (absolute error)
Mains signaling	Voltage	5...3000 Hz	0.01 Hz	±0.15% U_n for 1...3% U_n, 5% U_n for 3...15% U_n
Transients (PQM-703 only)		±6000 V (with max. sampling 10 MHz)	5V	±(0.5% +25 V)

*Clamp F-1, F-2, F-3:0..3000A (10000A$_{P-P}$) * Clamp C-4: 0..1000A (3600A$_{P-P}$)*Clamp C-5: 0..1000A (3600A$_{P-P}$)*Clamp C-6: 0..10A (36A$_{P-P}$) (without current transformers) Clamp C-7: 0...100 A (360A$_{P-P}$)

Standard accessories:

- Test leads 2.2 m; 7 pcs (permanent),
- "Crocodile" clip K01; black; 3 pcs, — **WAKROBL20K01**
- "Crocodile" clip K02; yellow, — **WAKROYE20K02**
- "Crocodile" clip K02; blue, — **WAKROBU20K02**
- "Crocodile" clip K02; red; 2 pcs, — **WAKRORE20K02**
- USB cable, — **WAPRZUSB**
- Power supply plug (L1 and N), — **WAADAAZ1**
- Adapter AC-16, — **WAADAAC16**
- Hard carrying case, — **WAWALXL2**

- Straps for PQM, — **WAPOZOPAKPL**
- DIN Rail Mounting Clip (ISO) (3 - elements), — **WAPOZUCH3**
- Voltage Adapter with M4/M6 thread; 5 pcs, — **WAADAM4M6**
- Magnetic voltage adapter; 4 pcs, — **WAADAUMAGKPL**
- Fasteners and bands for mounting the analyzer on a pole; 2 pcs, — **WAPOZUCH4**
- Receiver – interfejs for radio transmission OR1 (USB), — **WAADAUSBOR1**
- Sonel Analysis software for data analysis,
- Built-in rechargeable battery,
- instruction manual, calibration certificate.

Additional accessories:

- Carrying case for clamps, — **WAWALL2**
- Clamps:

- External IP67 GPS antenna, 10 m, — **WAPOZANT10GPS**
- Rechargeable Li-Ion battery — **WAAKU11**

Clamp	C-4	C-5	C-6	C-7	F-1	F-2	F-3
INDEX	WACEGC40KR	WACEGC50KR	WACEGC60KR	WACEGC70KR	WACEGF10KR	WACEGF20KR	WACEGF30KR
Rated current	1000A AC	1000A AC 1400A DC	10A AC	100 A AC		3000A AC	
Max. overload current	1200A AC	1000A AC 3000A DC	20A AC	100 A AC		10kA AC	
Minimal measurable current	100mA	500mA	10mA	20 mA		1A	
Frequency	30Hz…10kHz	DC…5kHz	40Hz…10kHz	40 Hz…1 kHz		40Hz…10kHz	
Input signal level	1mV / 1A	1mV / 1A	100mV / 1A	500 mV / 1A		38.8µV / 1A	
Max. diameter of measured cord	52mm	39mm	20mm	24 mm	360mm	235mm	120mm
Minimal basic accuracy	≤0.5%	≤1.5%	≤1%	0,5%		1%	
Battery power supply	—	+	—	—		—	
Lead length	2.2m	2.2m	2.2m	3 m		2.2m	
Measurement category	IV 300V	IV 300V	IV 300V	III 300 V		IV 600V	

Sonel Analysis

„SONEL Analysis" software is an application used to work with PQM-702 power quality analyzer. It enables:
· analyzer configuration,
· reading data from the analyzer,
· network parameters check in real time (the ability to read data through GSM modem),
· data deleting in the analyzer,
· data presentation in tables,
· data presentation in diagrams,
· data analysis according to EN 50160 or according to user defined conditions,
· independent service of multiple analyzers,
· software upgrade through the internet.

Analyzer configuration

The software enables configuration of all analyzer's parameters. The configurator is made on the PC computer and later transferred to the analyzer. The configuration settings can be stored on hard drive or other data storage devices to be used later. The software enables the configuration of:

· the choice of Measurement Points and memory assignment to each Measurement Point,
· analyzer time settings,
· keyboard lock,
· PIN code security,
· averaging time setting
· choice of current and voltage transformers,
· trigger mode choice (immediately after an event or according to the scheduler),
· choice of clamp's type, setting of additional parameters registration in N and PE channels,
· choice of network type, for which the analyzer will be used.
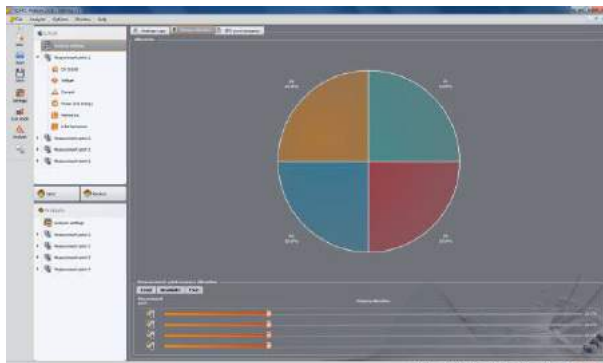
The analyzer has four independent Measurement Points. Each Measurement Point can be set individually to perform four different types of registration without need to change analyzer's configuration.

For each Measurement Point the following settings can be made:
· whether the analyzer shall work according to EN 50160 or according to user defined conditions,
· for each registration user can define, which network parameters shall be registered,
· for each parameter user can define whether the analyzer shall register average, minimum, maximum or instantaneous values,
· the limits beyond which the analyzer will record the event can be defined.

Live mode

"SONEL Analysis" software enables reading of selected parameters and their graphic presentation in real time. These parameters are measured independently of the registration saved in the memory. User can check:
· voltage and current diagrams (oscilloscope),
· diagrams of voltage and current in time function,
· scope phasor,
· different parameters values,
· harmonics and harmonics' power,
· interharmonics.
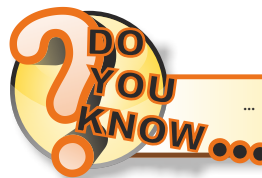
DO YOU KNOW...
... that software Sonel Analysis enables compensation of noise current for **clamps on inactive objects?**
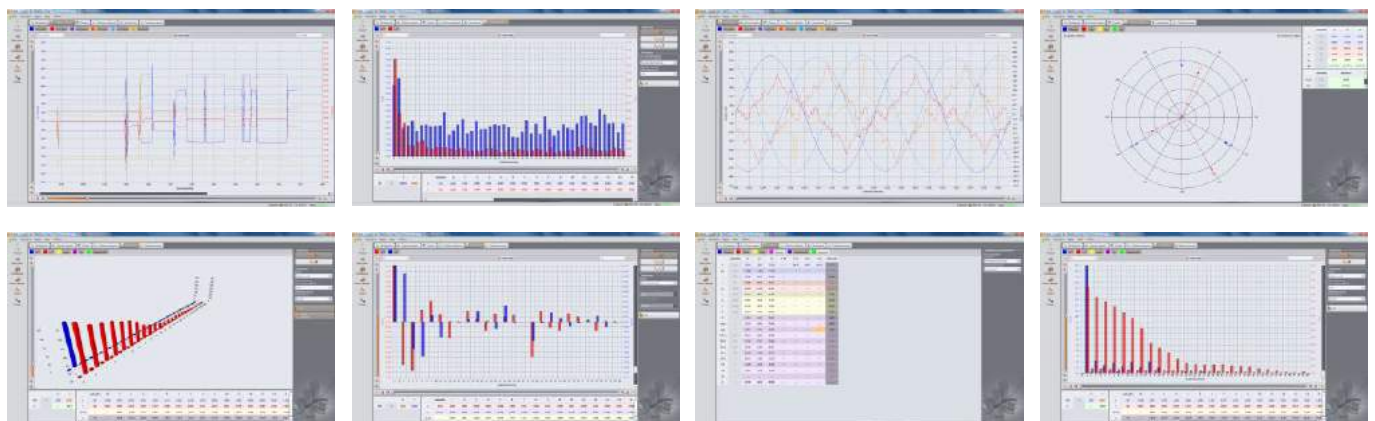
Data analysis

With "SONEL Analysis" software user can read data stored on the memory and analyze them. Data from the analyzer can be stored on hard drive and be used later. This feature enables data archiving.

The user can analyze the data from the device. There is a choice of:
· **General** – all data are shown with dots (Measurements, Events and Waveforms),
· Measurements – all measured values registered in averaging time are shown in table (voltage, frequency etc.),
· **Events** – all detected events are shown in table (dips, swells, interruptions, etc.),
· Configuration – display of settings, according to which data were recorded

The software enables different types of diagrams, which show in a simple way the registered data:
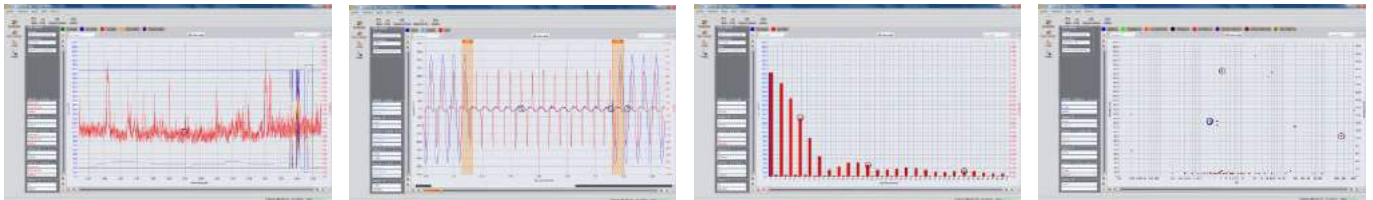
· Time diagram – graphs of indicated parameters in time function,
· Waveforms – graphs of instantaneous voltage and current during an event or at the end of averaging time,
· Harmonics diagram – bar graph showing harmonics from 1 to 50,
· Interharmonics – candle graph presenting up to 50th interharmonic.
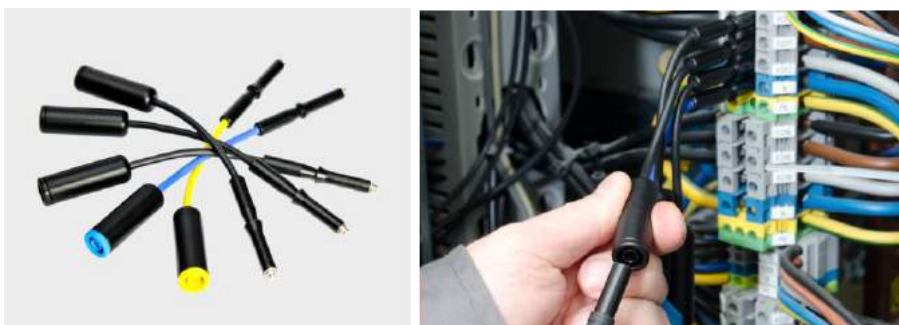· **Value/Time** diagram – graph of events' duration time.

With data from the analyzer user can prepare reports, which can be saved on the hard drive in PDF, HTML, CSV or TXT files. The software enable to prepare the report according to EN 50160 standard.

Standard accessories:

Magnetic voltage adapter used to connect voltage test leads to circuit breakers (type S) and residual current in switchgear - 4 pcs - W**AADAUMAGKPL**

Voltage Adapter with M4/M6 thread used to connect voltage test leads to rail connectors in switchgear - 5 pcs - W**AADAM4M6**

Hard carrying case