

Parameters PQM-750

Parameter	Measuring range	Max. resolution	Accuracy
Alternating voltage (TRMS) U_{L-L MAX} = 2000 V for U_{L-E MAX} = 1000 V	0,0...1000,0 V	4 significant digits	± 0,1% U _{din}
Crest Factor			
Voltage	1,0...6,5 (1.65 for voltage of 690 V)	0,01	± 5%
Current	1,00...10,00	0,01	± 5%
Alternating current (TRMS)	0...20 A	4 significant digits	± 0,2%
Frequency			
50 Hz and 60 Hz mains	40,000...70,000 Hz	0,001 Hz	± 0,01 Hz
400 Hz mains	340,00...460,00 Hz	0,01 Hz	± 0,1 Hz
Active power IEC 62053-22 class 0,2S	depending on voltage and current ratio	4 significant digits	± 0,2%
Reactive power IEC 62053-24 class 0,5S	depending on voltage and current ratio	4 significant digits	± 0,5%
Apparent power	depending on voltage and current ratio	4 significant digits	± 0,2%
Active energy IEC 62053-22 class 0,2S	depending on voltage and current ratio	4 significant digits	± 0,2%
Reactive energy IEC 62053-24 class 0,5S	depending on voltage and current ratio	4 significant digits	± 0,5%
Apparent energy	depending on voltage and current ratio	4 significant digits	± 0,2%
cosφ and power factor (PF)	-1,000...1,000	0,001	0,05
tanφ	-10,000...10,000	0,001	depends on error of active and reactive power
Harmonics and interharmonics			
Voltage	DC, 0...256	4 significant digits	± 0,05% U _{din} for m.v. < 1% U _{din} ± 5% v.Mw. for m.v. ≥ 1% U _{din}
Current	0...256	4 significant digits	± 0,15% I _{rin} for m.v. < 3% I _{rin} ± 5% v.Mw. for m.v. ≥ 3% I _{rin}
THD-F			
Voltage	0...20%	0,01%	± 0,3% (absolute error)
Current	0...100%	0,01%	± 0,3% (absolute error)
Active and reactive power of harmonics	depending on voltage and current ratio	4 significant digits	—
Angle between current and voltage harmonics	- 180,0...+ 180,0°	0,1°	≤ 0,05° for n = 1 ≤ 1° for 2 ≤ n ≤ 60 at f _{nom} = 50 Hz ≤ 4° for 61 ≤ n ≤ 256 at f _{nom} = 50 Hz
K-Factor	1,0...50,0	0,01	± 10%
Flickerindex	0,20...10,00	0,01	± 5%
Unbalance factor			
Voltage and current	0,0...20,0%	0,1%	± 0,15% (absolute error)
Measurement of control signals			
Voltage	up to 15% U _{din} at f _r = 5...30000 Hz	4 significant digits	unspecified for <1% U _{din} ± 0,15% for 1...3% U _{din} ± 5% for 3...15% U _{din}
Emissions in band			
2...9 kHz	a single frequency that is multiple of 200 Hz	0,01 V	± 0,1% U _{din} for v. Mw. < 2% U _{din} ± 5% v. Mw. for v. Mw. ≥ 2% U _{din}
8...150 kHz	a single frequency that is multiple of 2 kHz	0,01 V	± (5% + 0,1 V)
vm. v. – measured value			

Compliance with and compatibility with standards

The device meets the Class A requirements of IEC 61000-4-30. It is compatible with:

Product Standards

- IEC 62586-1 Power quality measurement in power supply systems – Part 1: Power quality instruments (PQI)
- IEC 62586-2 Power quality measurement in power supply systems – Part 2: Functional tests and uncertainty requirements

Standards for measuring network parameters

- IEC 61000-4-30 Electromagnetic compatibility (EMC) – Testing and measurement techniques – Power quality measurement methods
- IEC 61000-4-7 Electromagnetic compatibility (EMC) – Testing and Measurement techniques – General Guide on Harmonics and Interharmonics Measurements and Instrumentation for Power Supply Systems and Equipment Connected thereto
- IEC 61000-4-15 Electromagnetic compatibility (EMC) – Testing and Measurement Techniques – Flickermeter – Functional and Design Specifications
- EN 50160 Voltage characteristics of electricity supplied by public electricity networks

Safety standards

- IEC 61010-1 Safety requirements for electrical equipment for measurement control and laboratory use. Part 1: General requirements
- IEC 61010-2-030 Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 2-030: Particular requirements for equipment having testing or measuring circuits

Electromagnetic Compatibility Standards

- EN 55032 Electromagnetic compatibility of multimedia equipment – Emission Requirements
- IEC 61000-6-5 Electromagnetic compatibility (EMC) – Part 6-5: Generic standards – Immunity for equipment used in power station and substation environment

Standard accessories



Seal for voltage and current terminals (set of 2)
WAPOZPLOKPL



Fork terminal for grounding terminal
WAZACWID



8 GB microSD card
WAPOZMSD8



Wall mounting kit
WAPOZUCH17



LAN network cable, shielded, 1.5 m
WAPRZRJ451X5EKR



Factory calibration certificate

Optional accessories

- External GPS module WAMODGPS1
- External antenna for GPS module
 - 10 m WAPOZANT10MODGPS1
 - 20 m WAPOZANT20MODGPS1
 - 30 m WAPOZANT30MODGPS1
- External GPS-LTE module with external antenna
- External module for additional inputs/outputs
- External 7" LCD touch panel
- Calibration certificate with accreditation

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Power Quality Analyzer

Sonel PQM-750

Class A device for mounting on a DIN rail.

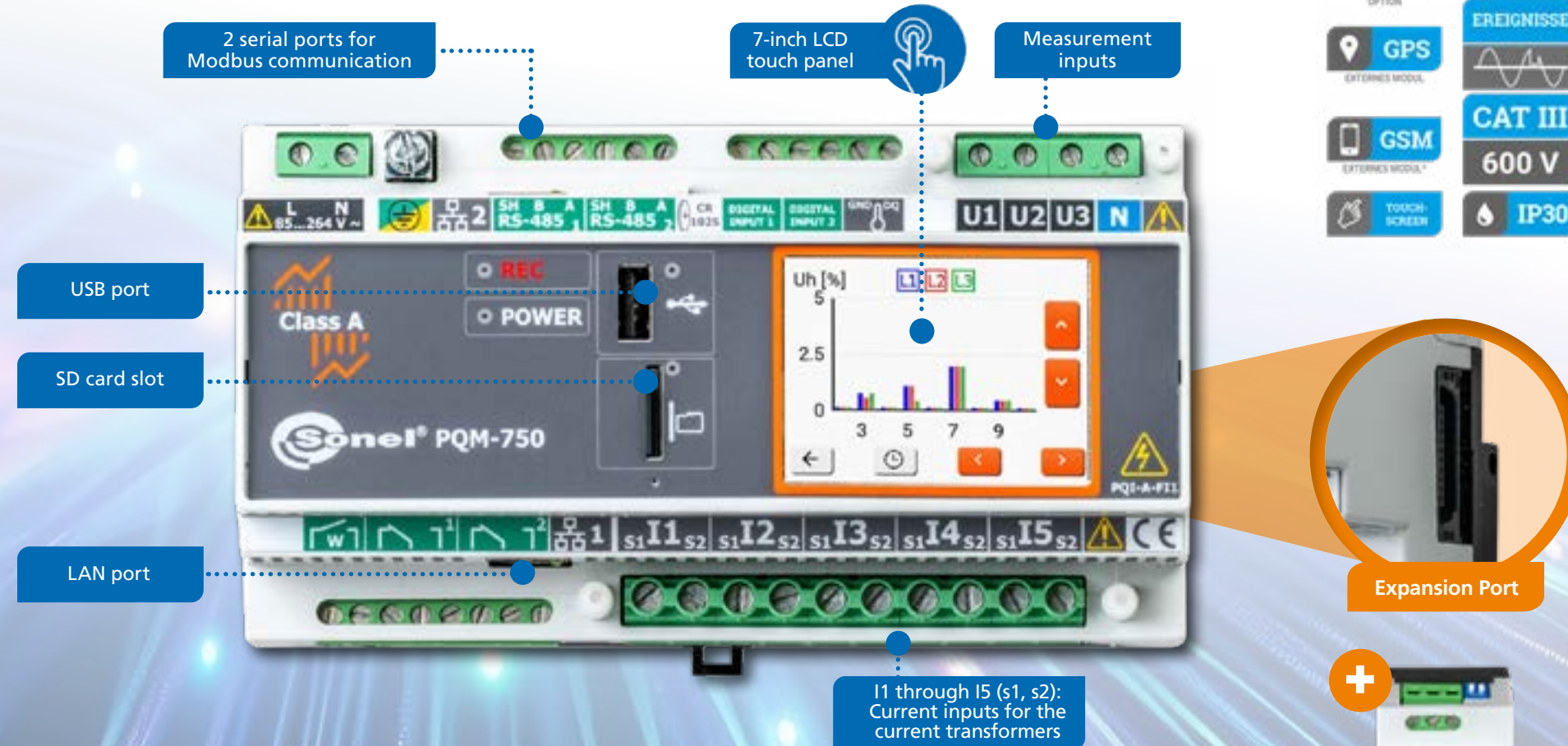


High-precision network analysis: stationary, modular, high-performance

- **Monitoring and recording of grid parameters** to ensure compliance with standards, legal requirements, and to verify power supply contracts
- Class A device for DIN rail mounting with a modular design, expandable with additional modules and suitable for 50-, 60-, and 400-Hz networks
- **Flexibly configurable** – each module combination forms a unique device variant

The solution for professional network monitoring

The Sonel PQM-750 offers you the highest measurement accuracy (Class A): standard-compliant, legally valid measurements for energy contracts and regulatory requirements.

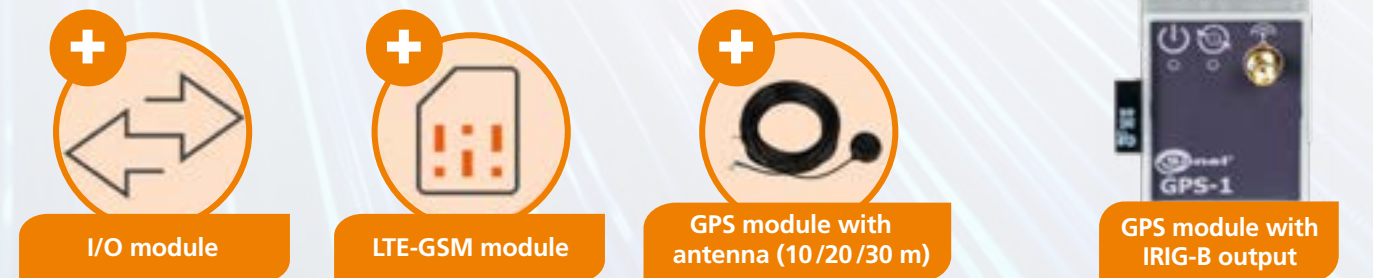


Key Features of the PQM-750

- Full class A according to IEC 61000-4-30, confirmed by a certificate from an accredited laboratory
- Voltage inputs L1, L2, L3, N, E (5 terminals)
- L1, L2, L3, N, E currents (5 current transformers)
- Built-in 5 A or 1 A current transducers, or a variant without transducers, but cooperating with external transducers
- Possibility of indirect measurements with calculation results for the primary side
- Operation in 50 Hz, 60 Hz, 400 Hz networks
- Recording of voltage and current events along with waveforms
- Design with or without transient measurement module
- Measurement of more than 4,000 parameters
- 24-bit analog-to-digital converter
- Basic sampling rate of 80 kHz
- Conducted emissions monitoring in the 2...150 kHz band
- Two LAN ports, including one with the option of powering the meter with PoE (Power over Ethernet)
- Built-in rechargeable battery
- Two mains power supply options: built-in power supply unit 85...264 V AC (120...300 V DC) or 18...60 V DC
- 8 GB memory (microSD card)
- USB port for meter updates and data exchange
- Two binary inputs, two relay outputs, two RS-485 ports
- Relay output to monitoring analyzer operation (Watchdog)
- 1-wire input for external temperature sensors
- 2.4" touch screen
- DIN rail or wall mounting
- Expansion bus allowing connection of various external modules (e.g. GPS, LTE)
- Built-in web server for programming, data readout, event list, and oscillogram / RMS display
- Time synchronization with the reference via NTP servers, IRIG-B (via built-in RS-485)
- Optional GPS module and antennas
- Measurement category CAT III 600 V (IV 300 V) for voltage inputs
- Measurement category CAT III 300 V for current inputs
- Possibility of sealing current and voltage inputs

Modular system with optional extensions

The expansion port allows you to add additional communication protocols as well as hardware and software features.



Additional features

Standard transmission protocols

- Modbus TCP/IP
- Modbus RTU
- IEC 61850
- PQdif

Network interface (web server)

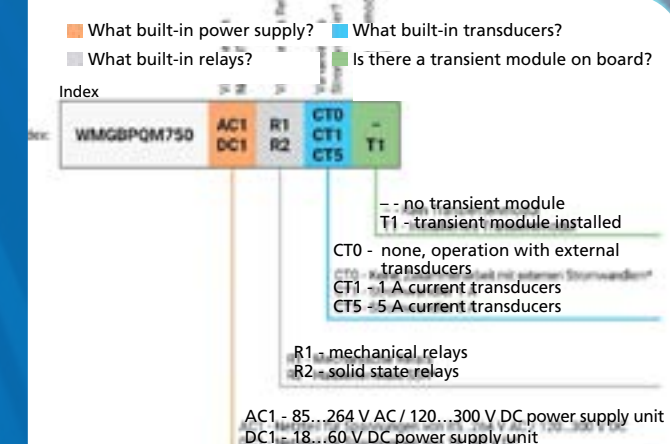
- Access to the interface is possible from any browser

Variations

The PQM-750 can be configured in various ways. Each set of builtin internal modules is a separate sales index for the analyzer.

Example: Index WMGBPQM750AC1R1CT5T1 represents the following configuration:

- Power supply for voltages of 85–264 V AC / 120–300 V DC (Segment AC1),
- Mechanical relays (Segment R1),
- 5 A current transformer (Segment CT5),
- Transient module installed (Segment T1).



Measured parameters

Built-in software (web interface – webserver) allows you to configure the device and view actual data. It allows measurement of the following parameters.

- RMS phase voltage U for L1, L2, L3 + N/PE
- RMS voltages U between phases for L12, L23, L31
- RMS currents I of all phases + N + PE
- Voltage and current crest factor CF
- Frequency f of the L1 network
- Active power P for L1, L2, L3
- Active power $P1$ (separate 50 Hz) for L1, L2, L3
- Reactive power Q for L1, L2, L3
- Reactive power $Q1$ (separate 50 Hz) for L1, L2, L3
- Apparent power S for L1, L2, L3
- Apparent power $S1$ (separate 50 Hz) for L1, L2, L3
- Total three-phase power P_{3F} , Q_{3F} , S_{3F}
- Total three-phase power $P1_{3F}$, $Q1_{3F}$, $S1_{3F}$
- $\cos\phi$ for L1, L2, L3, $\cos\phi_{3F}$
- Power factor PF for L1, L2, L3, PF_{3F}
- $\tan\phi$ for L1, L2, L3, $\tan\phi_{3F}$
- Distortion power D for L1, L2, L3
- Total three-phase distortion power D_{3F}
- Distortion power factor DPF for L1, L2, L3
- Waveforms of phase voltages and currents for events
- Phase diagrams for currents and voltages
- Active energy for L1, L2, L3 – consumed E_{p+} or supplied E_{p-}
- Three-phase active energy – consumed E_{p3F+} or supplied E_{p3F-}
- Inductive reactive energy for L1, L2, L3 for consumption – E_{QL+}
- Capacitive reactive energy for L1, L2, L3 (consumed) – E_{QC+}
- Three-phase reactive energy (consumed) – inductive E_{QL3F+} and capacitive E_{QC3F+}
- Reactive power for L1, L2, L3 – E_S
- Three-phase reactive power E_{S3F}
- Harmonics up to the 256th order of current and voltage
- Interharmonics up to the 256th order of current and voltage
- Phase angle between the harmonics of current and voltage
- Monitoring of frequency between 2...150 kHz
- Components of U_{DC} phase voltages
- Ratio of harmonic currents and voltages to the RMS value (%) – hnR
- Ratio of harmonic currents and voltages to the fundamental harmonic $h1$ (%) – hnF
- THD_R for voltages and currents, calculated relative to the RMS value (%)
- THD_I for voltages and currents, calculated relative to the fundamental harmonic (%)
- TID_R for voltages and currents, calculated relative to the RMS value (%)
- TID_I for voltages and currents, calculated relative to the fundamental harmonic (%)
- Active and reactive power of harmonics
- K-factor for I_1 , I_2 , I_3 , I_N
- Factor (Europe) Factor K
- Symmetrical voltage components: zero U_0 , positive U_1 , negative U_2
- Symmetrical current components: zero I_0 , positive I_1 , negative I_2
- Short-term flicker factor P_{st}
- Long-term flicker factor P_{lt}
- Voltage asymmetry factor
- Current asymmetry factor
- U-transients up to 6000 V
- Control signals
- Temperatures: T_w (internal), $Tz1...Tz4$ (1-wire)