



# Power Network Analyser

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Unilyzer 902

# The need for a new Power Network Analyser

Increased focus on Power Quality is bringing analysis up to a broad scale this decade. Not only technical performance is in focus when selecting the power network analysing tool, but also field conditions are becoming important when the analysis goes beyond control rooms and is being deployed in the network.



The Unilyzer 902 is a portable analyser made for Power Quality measurements in the power distribution network. The 902 platform consists of a stand-alone unit that is dust and splash-proof (IP-65) and has no moving parts. It measures all parameters in national and international norms, like the EN 50160, and captures disturbances, like transients, sags and swells simultaneously! The rough environment enclosure allows the Unilyzer 902 to measure anywhere in the network and the new platform is based on latest technology available in order to give maximum performance and numerous applications.

Combining high performance with ease of use and ease of installation we offer you a complete package including measuring unit, transducers and all necessary software in a specially designed carrying case. On site, a Unilyzer 902 is up and running in no time!

## High performance

Thanks to the powerful DSP-technology Unilyzer 902 measures all periods without any time gaps. To ensure highest possible accuracy the Unilyzer 902 also has a built-in hardware PLL (Phase-Locked-Loop) locking to the fundamental frequency. Unilyzer 902 measures simultaneously voltage, current, power, energy, all power quality parameters and disturbances like transients and sags and swells.

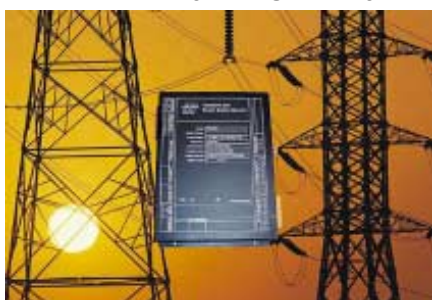
## Disturbances

Four independent trig-channels capturing sags, swells, fast transients, interruptions, frequency deviations and other events simultaneously. Waveforms and other parameters are recorded on all eight channels with every event.



Automatic analysis according to recognised standards, like EN 50160, saves time and effort.

Unilyzer 902 can also be integrated in PQ Secure. Our Power Quality Management system.



- ◆ Power Quality analysis (e.g. EN 50160)
- ◆ Automatic transducer identification
- ◆ V, A, W, VA, VAr, kWh, kVArh, PF, cos phi, Hz, °C, IFL, P<sub>ST</sub>, P<sub>LT</sub>, energy and more
- ◆ Harmonics analysis and interharmonics (IEC 61000-4-7)
- ◆ Direction of power harmonics
- ◆ Flicker, IEC 61000-4-15 (IEC 868)
- ◆ All parameters IEC 61000-4-30
- ◆ PQ Secure, Power Quality Management
- ◆ Transients, sags and swells
- ◆ Signalling voltage
- ◆ Automatic analysis according to recognised standards



The Unilyzer 902 is dust and splash proof. It can be used in all environments.

### Unique Real Time Features

If connected to a (portable) PC, Unilyzer 902 offers powerful real-time capabilities including values display, an eight channel oscilloscope, a harmonics spectrum analyser and a trend-graph showing the last 24-hours of all measured parameters and events without transferring any data to the hostcomputer. The phasor (or vector) diagram helps to identify phase relationships and to check wiring connections.

### Software for Evaluation

Unipower offers powerful evaluation capabilities. In **PowerProfile** you see historical data and waveforms in graphical form that can easily be printed or copied into a word processor. **PQ Online** gives you real-time graphs and values.

**Unipower Report** gives you Power Quality Assurance according to recognised standards such as the EN 50 160 and automatically produces a report. It's also easy to export the data to a standard spreadsheet such as Microsoft Excel.

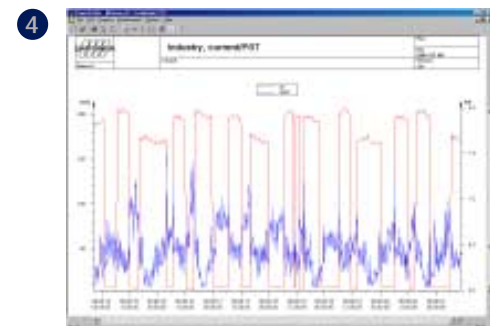
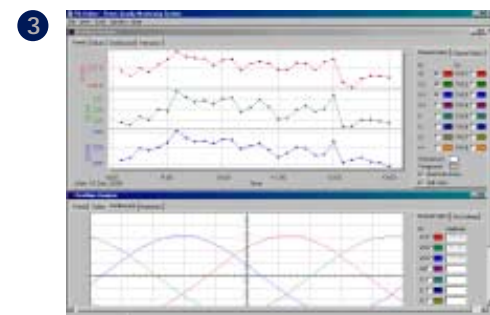
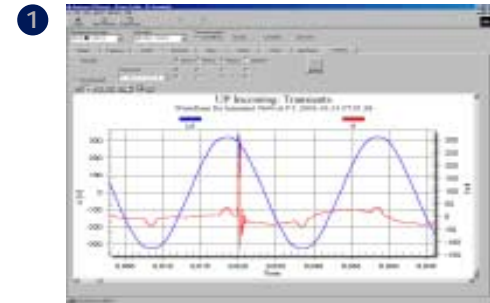
### Flexibility

The Unilyzer 902 can operate stand-alone or be connected to a PC for real time operation. As a stand-alone unit it is robust and easy to use - only one button to bother about. On site, when connecting the unit and checking the status in the network the real-time module is invaluable.

The Unilyzer 902 has an internal

modem (optional) and Ethernet interface (optional) that allow remote access to the unit. For the really remote site a GSM-modem can be connected to the unit. If integrated in the PQ Secure Power Quality Management system measure data can even be automatically downloaded.

- 1 All transients are captured with a pre-trig and all channels are recorded with every event. By studying voltage and current simultaneously the transient direction can be determined.
- 2 A sag/swell is a change in the voltage rms value. When the limits are exceeded the event is recorded with the depth and duration. All channels are recorded with every event.
- 3 The real time trend graph gives immediate information on variations the last 24 hours, not requiring any download of data. The oscilloscope and the phasor diagram gives valuable information when connecting the instrument.
- 4 All parameters can easily be plotted in time diagrams, be printed or be exported to other formats. You can easily export any data to, for example, Microsoft Excel.
- 5 Powerful real time features with continuous update.



# Unilyzer 902 - Technical Specification

## Voltage inputs

Voltage channels	4 differential inputs (including 4 voltage transient inputs). For maximum accuracy, automatic synchronisation to the power frequency is performed by a phase-locked loop (PLL).
Channel input level	0 - 700 V RMS
Resolution	14 bits (84 dB)
Sampling-rate	up to 7.7 kHz (15.4 kHz). No time gaps.
Transient detection	>1us duration (1 MHz)
Transient capture input	+/- 4 kV peak
Transient resolution	14 bits (84 dB)
Detectable transients	Fast transients (>1 us), sags, swells and interruptions
Input impedance	3 Mohm
Bandwidth	3.2 kHz for calculated parameters (1 MHz for transient inputs)
Accuracy	<0.1%, better than IEC 61000-4-7 class A

## Current inputs

Current channels	4 differential inputs
Channel input level	0 - 200 mV RMS. Transducers available for 0 - 2000 A.
Resolution	14 bits (84 dB)
Sampling-rate	up to 7.7 kHz (15.4 kHz). No time gaps.
Input impedance	3 Mohm
Bandwidth	3.2 kHz
Accuracy	<0.1%, better than IEC 61000-4-7 class A
Storage interval	Individually selectable storage interval for different parameters, from 1 second or longer.
Storage capacity	4 MB solid state, non-volatile flash memory for measure data. Standard memory will hold ca 20 days of measure data, up to 60 sag/swell trends, up to 50 transient waveforms and up to 80,000 events. 8 MB memory is optional.
Communications	Built-in RS-232. Optional Ethernet and internal modem. External modems, radio devices and GSM-modems can be connected.
Power Quality norms	EN 50 160, SS 421 18 11
Size W x H x D	340 x 337 x 85 mm (including transducers)
Enclosure	IEC 529 - IP65, dust and splash proof
Operating temperature	-10 °C to +50 °C
Operating humidity	10% - 98% non-condensing
Weight	2.6 kg
Personal safety	EN 61 010-1
EMC protection	EN 50 081-1,2; and EN 50 082-1,2 (CE-marked)
Power supply	85-264 V AC (47 to 63 Hz) or 110-375 V DC

## Measurements

Voltage [V]	Rms value every ½ cycle and transient peak value registered. Min, max and average value each storage interval.
Current [A]	Rms value every ½ cycle registered. Min, max and average value each storage interval.
Frequency	45 - 65 Hz
Harmonics	Harmonics and inter-harmonics from 0 to 3000 Hz (50:th) of voltage and current according to IEC 61000-4-7 class A.
THD-F (Fundamental)	Total harmonic distortion related to the fundamental.
THD-R (Relative, RMS)	Total harmonic distortion related to the total RMS-value.
THD-E (Even)	Total Even Harmonic Distortion related to the fundamental.
THD-O (Odd)	Total Odd Harmonic Distortion related to the fundamental.
THD-I (Inter)	Total Inter-Harmonic Distortion related to the fundamental.
TDD	Total Demand Distortion related to nominal value.
THD-2650	Total Upper Band Harmonic Distortion (26th to 50th) related to the fundamental Transformer derating, k-factor.
K-factor	Power for each frequency (up to the 11 <sup>th</sup> harmonic) with sign indicating disturbance direction.
Power Harmonics (PFFT)	IFL (real time flicker), Pst and Plt calculated according to standard IEC 61000-4-15 (IEC-868)
Flicker:	Positive-, negative- and zero phase sequence voltage/current plus unbalance (%) according to standard IEC 61000-4-30
Voltage Unbalance and current Unbalance	According to EN 50160 and IEC 61000-4-30
Signalling Voltage Sags and swells	All channels are recorded during 2.0 - 2.5 s (125 cycles) with 0.1s pre-trig. Selectable trig condition. Sag management data. Event depth, duration and disturbance direction calculated.
Transients	All events with a duration >1us are captured. All channels are recorded during 5 cycles with 1 cycle pre-trig. Selectable trig condition. Peak voltage, maximum deviation level and duration calculated.
PQ Measurements	IEC 61000-4-30 class A

## Power measurements

All power quantities below are calculated for single phase or any wye- or delta three-phase configuration.

Active power [kW], Reactive power [kVAR], Apparent power [kVA], Power Factor, Displacement Power Factor (cos phi), Active Energy [kWh], Reactive energy [kVARh], Apparent energy [kVAh]

## Data Storage and Real Time Capabilities

Measured values are stored in a non-volatile flash memory. The system does automatic statistics like average, minimum and maximum values as well as cumulative probability analysis for flicker.

Unilyzer 902 can also be connected to a PC for powerful real time analysis including waveforms, values, harmonics spectrum and more. Real time and all other measurements performed simultaneously and the update is continuous. The system has automatic transducer identification.