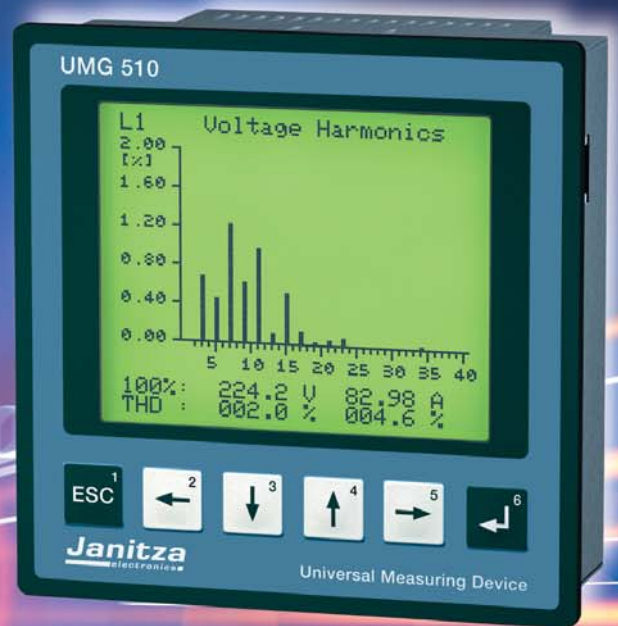


# UMG 510



Ethernet



Profibus DP  
Modbus/TCP  
Embedded Webserver

Power Quality Analysis  
according to EN 50160

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# Universal Measuring Device



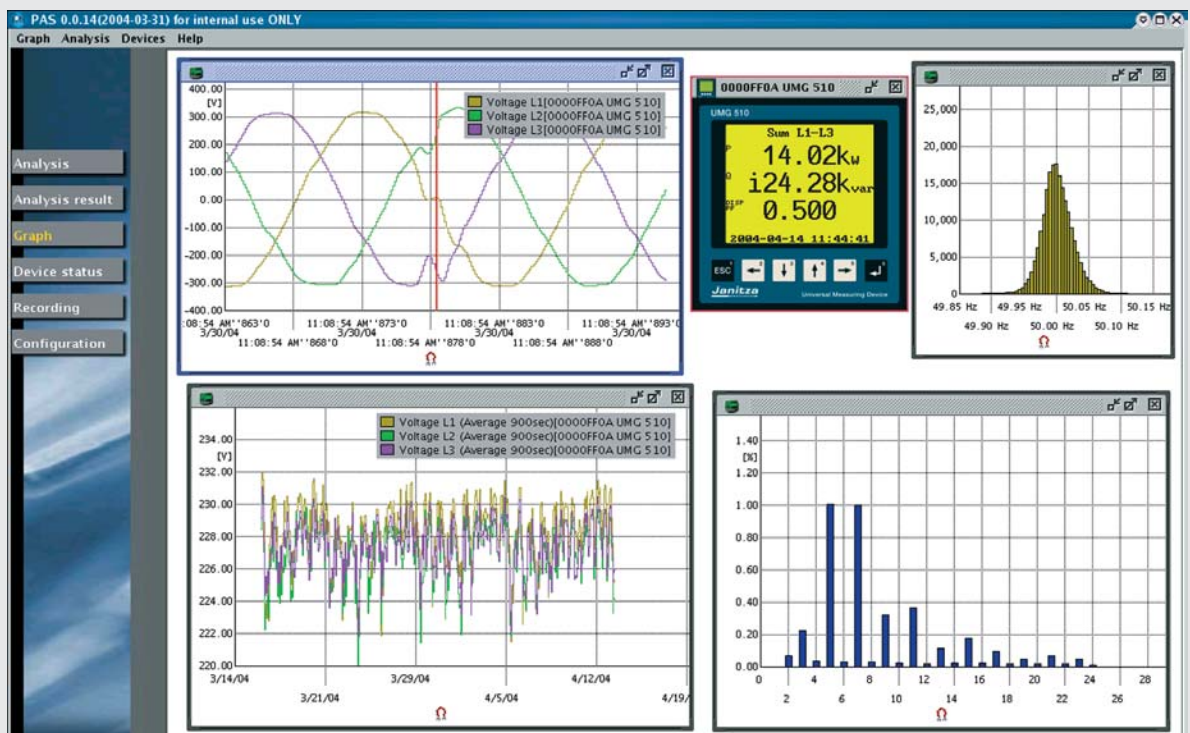
Power Quality Analysis according to EN50160

Equipped with each 4 voltage and current measurement inputs, the UMG510 acquires the rms voltages and currents in power grids from 40 to 70 Hz. By sampling and analog to digital conversion the internal DSP (digital signal processor) determines the electrical quantities. For three phase measurements the load relevant voltage can be defined as line-to-neutral or line-to-line voltage. The load relevant voltages are further processed for harmonic analysis, flickermeter and transient and event recording.

The measured values and the recorded data are available for reading out via Ethernet by the PAS510 PC-software. The PAS510 software is provided with every unit in accordance to DIN EN 50160 and EN 61000-2-4.

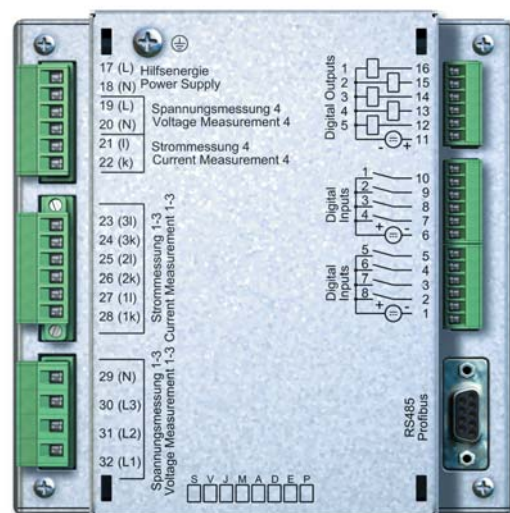
## Functional Description:

- Automatic adaption to power line frequencies from 15Hz ... 440Hz
- Measurement window of 10 (50Hz) or 12 (60 HZ) periods (200ms)
- Gapless sampling and calculation of:
  - RMS voltage line-neutral
  - Star point and unbalance L1 ... L3
  - RMS voltage line-line
  - Frequency (same for all inputs)
  - RMS current each input, sum L1 ... L3, sum L1 .. L3 + N
  - Power (active, reactive, apparent, power factor, distortion power)
- Sum power L1 ... L3 of the above values
- Active energy (consumed/delivered), main and auxiliary input
- Reactive energy (inductive/capacitive), main and auxiliary input
- Voltage and current harmonics (up to 50th order), up to 3,5 KHz
- Interharmonics, current and voltage (up to 50th order)
- Voltage and current THD (total harmonic distortion)
- Flickermeter (Pf5, short term Pst, long term Plt)
- Ripple control signal level



## Technical Data

Installation Category:	CATIII
Degree of Pollution:	2
Operating Temperature:	-10°C .. +55°C
Storage Temperature:	-20°C .. +60°C
Dimensions:	W144xH144D90mm
Protection Category:	1, unit has safety ground
Power supply:	95 .. 265V AC; 100 .. 370 VDC, 15 VA
Current range:	5A (1A); 0,2 VA
Minimum working current:	5mA
Voltage range:	L-N 5 .. 500V AC; 0,2VA; 15-440Hz L-L 8 .. 870V AC; 0,2VA; 15-440Hz
Protection class front :	IP50 according to IEC60529
With optional gasket:	IP54 according to IEC60529
Rear:	IP 20 according to IEC60529
Sampling rate:	28,8 KHz



### Interfaces:

- Profibus DP V0, RS485 (Modbus/RTU, Gateway Ethernet to Modbus), Fast Ethernet 10/100Base-TX
- Protocols: HTTP, NTP, Modbus TCP, Modbus over TCP, DHCP

Measured values and recorded data can be read out via TCP/IP (Ethernet). The PAS510 software is provided for configuration and analysis of the recorded data. The fieldbus protocols (Modbus/RTU, Modbus/TCP, Profibus) can be used to control the digital inputs and outputs and to read out current measurement values.

### Acquisition and recording

- Acquisition and recording of minimum, maximum and mean value of any measurement value, programmable time base
- Acquisition and statistical recording (histogram) of a programmable timebase
- Detection of voltage sags and swells of at least half cycle duration <sup>1)</sup>
- Detection of voltage interruptions
- Detection of inrush currents of at least half cycle duration <sup>1)</sup>
- Detection of transient events from 70µs
- Energy metering (active and reactive, consumed and delivered), 4 Tariffs
- Data storage in internal 128MB flash memory
- Line writer for 512 half cycles (rms-values) in case of events

<sup>1)</sup> only at frequencies 15-70 Hz



### Digital In/Out

- 8 digital inputs, used for selection of Tariff, external synchronisation and enabling of recordings, pulse counter for external meters.
- 5 digital outputs, user configurable as pulse or alarm output
- 8 programmable comparators for monitoring of up to 4 values each

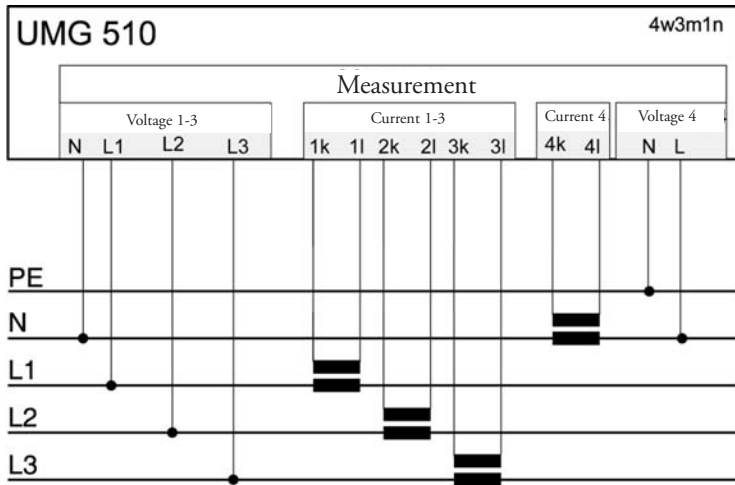
### Measurement uncertainties:

Value	Frequency range	Uncertainty	
Voltage	15 .. 70Hz	±(0,2% rdg + 0,02% rng)	
Current	40 .. 70Hz	±(0,2% rdg + 0,05% rng)	
Power	40 .. 70Hz	±(0,75% rdg + 0,0075% rng)	power factor > 0.8

Accuracy class to EN61036:1996, VDE0418 Part 7:May 1997, IEC1036:1996 with current transformer .. / (1) 5A : Class 1  
Voltage 15 .. 440Hz ±(0,4% rdg + 0,02% rng)

## Example wiring Diagram UMG 510

Three phase measurement with auxiliary input (neutral current)



### Main input:

The UMG510 unit has each 4 inputs for voltage and current measurement. Three of them are used for three phase measurements.

### Auxiliary input:

The fourth input (voltage/current) is usable for single phase or symmetric three phase systems. Alternatively the current input can be used for neutral current measurement (additional to the main input).

The auxiliary voltage input could be used for instance to monitor the voltage between neutral and ground. The auxiliary input provides all measurement values of the main measurement (current, voltage, power, harmonics, transients, events and flickermeter).

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