

## Class A power quality analyser according to IEC61000-4-30

The UMG 511 power quality analyser is particularly suitable for monitoring power quality according to standards such as the EN 50160. All power quality parameters are collected and analysed e.g. flicker, short term interruptions with fault recorder function, transients, harmonics up to the 63<sup>rd</sup> and inrush currents etc. Extensive communication possibilities e.g. RS 485 Modbus, Profibus, Ethernet (TCP/IP), BACnet, HTTP, FTP, SMTP, SNMP, DNS ... allow cost effective and rapid integration in existing communication networks. Worldwide access to the embedded web server can be gained through a web browser. The GridVis software included in the content of delivery allows extensive analysis just by the click of a button.

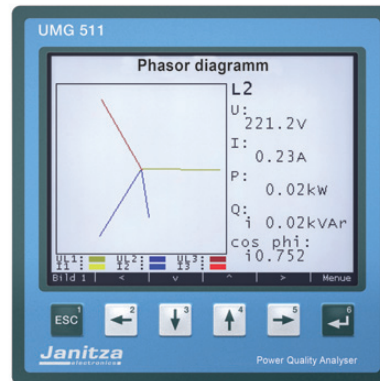
### Areas of application

- Continuous monitoring of the power quality e.g. EN 50160
- Ethernet gateway for subordinate measurement points
- Analysis of electrical faults for network problems
- Monitoring of the internal distribution network according to EN 61000-4-7, 4-15, 4-30
- Report generator for EN 50160 analysis
- Remote control

## UMG 511 power quality analyser

### Added value with additional functions

The UMG 511 power quality analyser serves for the purpose of continuous monitoring of the power quality e.g. in accordance with EN 50160. This serves for the purpose of monitoring the supply power quality from the energy supply side. The UMG 511 can also be used in applications for failure analysis on the consumer side and is also used as a preventative measure for network perturbations. A rapid, cost-optimised and reliable communication system can be developed through the Ethernet connection. The instrument's own homepage offers you the opportunity to call up the data or configure the instrument directly using the embedded web server.



The large number of digital and analogue inputs and outputs offer a variety of communication systems possibilities and allows connection to PLC systems and independent control tasks. The GridVis analysis software represents a fundamental part of the standard delivery. The GridVis can be used to practically trigger analysis in accordance with EN 50160 with the click of a button. The presentation of online data and the analysis of historical data is also a benefit for finding the root cause of network problems.

### Main features

- Measurement of power quality according to **DIN EN 61000-4-30, Class A**
- Fourier analysis **1<sup>st</sup> to 63<sup>rd</sup>** harmonic for U-LN, U-LL, I, P (consumption/supply) and Q (ind./cap.)
- Measurement of harmonics and interharmonics (U-LN, U-LL, I) according to **DIN EN 61000-4-7**
- Analysis and evaluation according to **DIN EN 50160** with the contained programming and analysis software GridVis
- Flicker measurement according to **DIN EN 61000-4-15**
- Measurement in TN and TT grids (600V CATIII)
- 4 voltage measuring inputs, 4 current measuring inputs
- **Continuous sampling of voltage and current inputs with 20kHz**
- Recording of more than 2000 different measurement parameter per measuring cycle (200ms)
- Detection of transients >50µs and storage with up to 16.000 samples
- Data logger / Event memory (256MB Flashdisk)
- 8 digital inputs and 5 digital outputs
- Profibus DP/V0 alternatively RS 485 (Modbus RTU, Modbus-Master, optional **BACnet**)
- **Ethernet** (Web-Server, E-Mail, optional BACnet)
- Programming of customer specific applications in Jasic®

### Applications

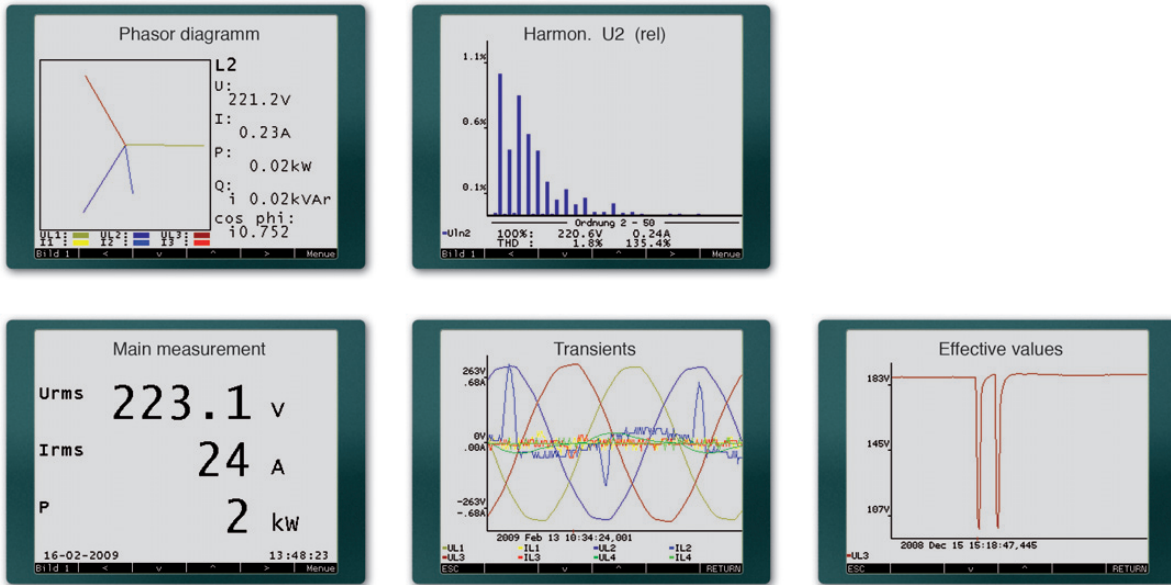
The power quality analyser which is equipped with 4 current and voltage inputs collects and digitalises the effective values (True RMS) from currents and voltages in 40-70Hz (15-440Hz) networks. The integrated microprocessor calculates the electrical parameters from the sampling values. The relevant voltage can be defined as a phase-neutral or a phase-phase voltage for measurement in a three-phase system. The voltage serves the UMG 511 as a refer-

ence voltage for harmonic measurement, transient and event recording and for the flicker meter. A nominal current can be set using this for the measurement of electrical current events. The 4th current and voltage input represents a separate measurement system. However, it is generally used for measuring the current in the neutral or PE conductor or used for measuring a voltage difference between N and PE.



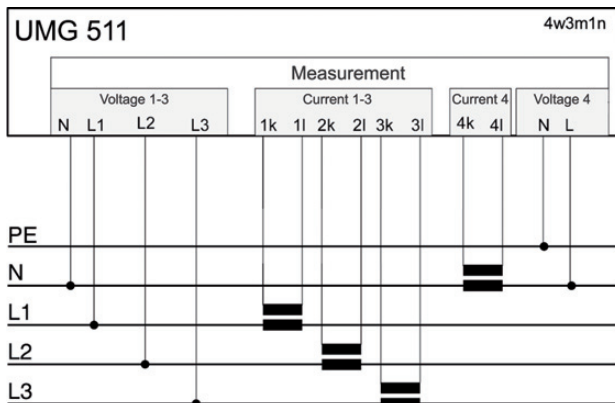
## Display examples

The backlit active matrix display (5,7") of the UMG 511 enables the presentation of measurement values in numerical form, as a bar chart or as a line graph. Selected displays can automatically be displayed in alternation (automatic display rotation). The instrument is programmed using userfriendly clear text menus or the GridVis software.



## Example of a UMG 511 connection illustration

Measurement in a four-phase network with main measurement and auxiliary measurement



## Main measurement

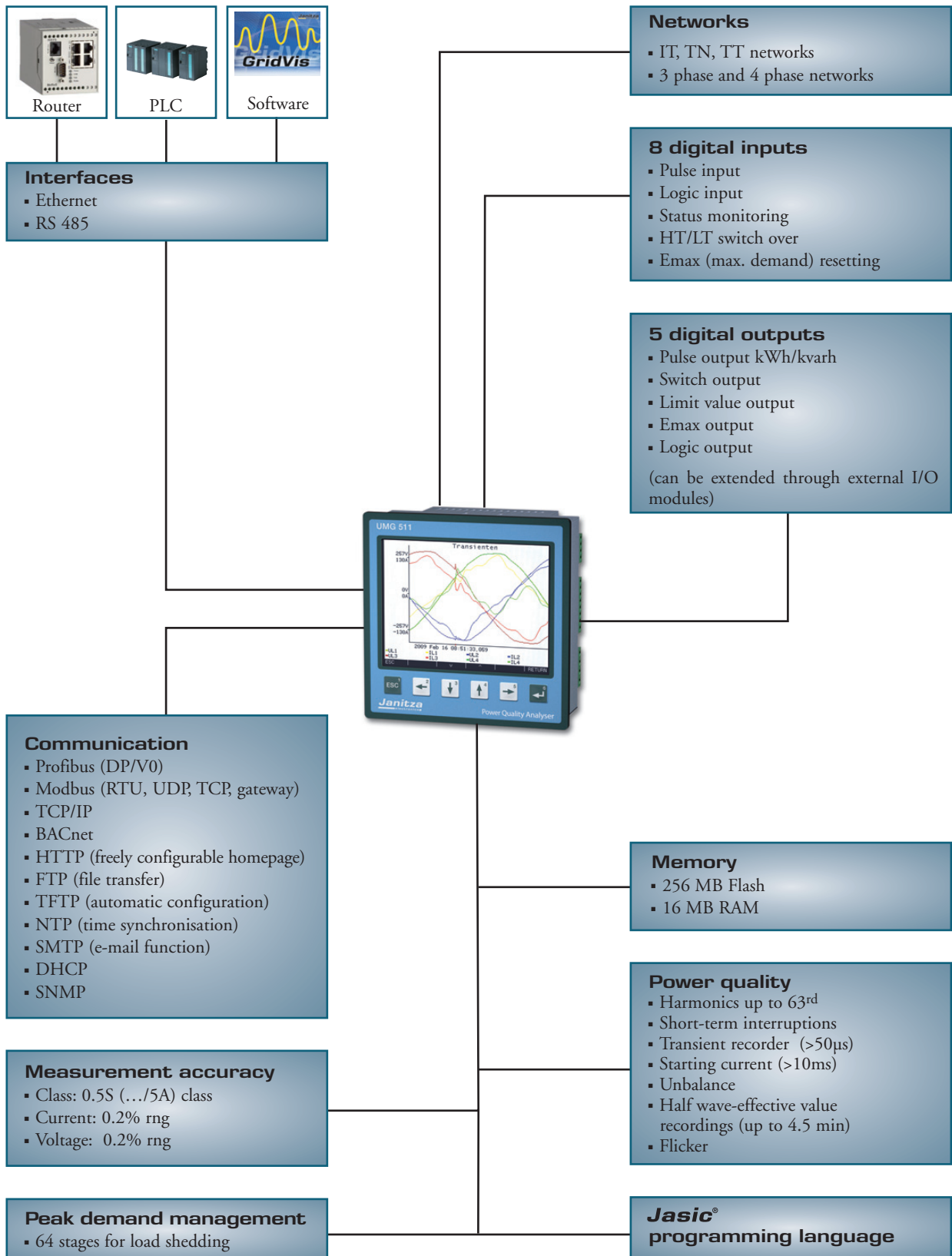
The UMG 511 has 4 measurement channels for current and voltage. The first three channels (main measurement) are intended for use in a three-phase system.

## Auxiliary measurement

The auxiliary measurement can be used for measurement in a single-phase or symmetrical three-phase system. Alternatively, the current input can be allocated to the three-phase system of the main measurement for measuring the neutral-conductor current. For example, the voltage input could then be used for recording the voltage between the neutral conductor and PE. The auxiliary measurement provides all measurement parameters like in the main measurement (current, voltage, power, harmonics, transients, events and flicker).

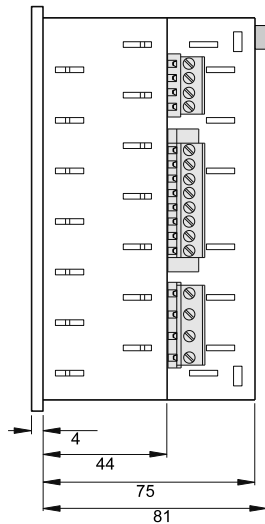
# Scope of operation

Scope of operation

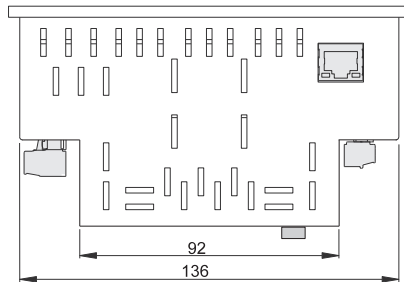




## Dimensional drawing

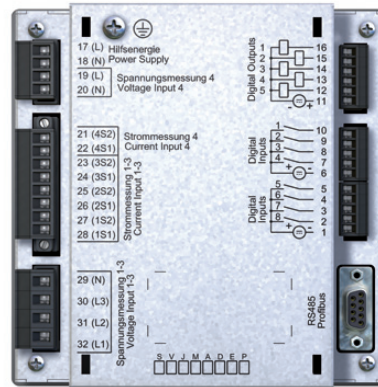


Side view



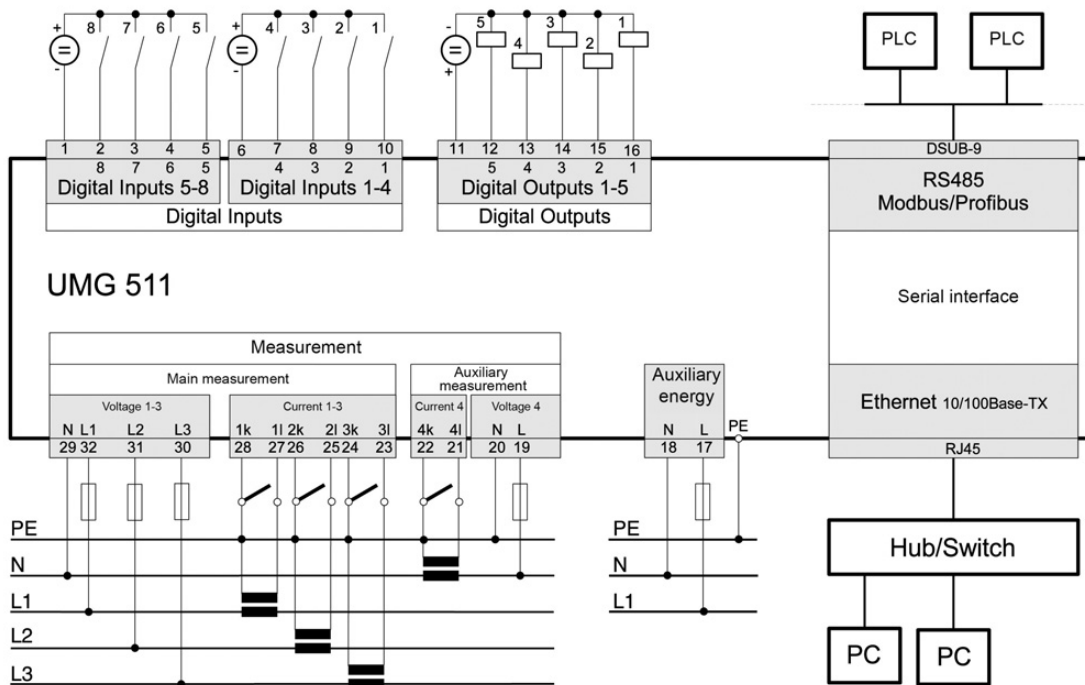
View from below.  
All measurement data in mm.

## Connection illustration



Ethernet connection

## Typical connection



Overview of product variants UMG 511											
Three/four phase power quality analysers; current transformer .../1/5a; including GridVis programming and analysis software											
Supply voltage			4 voltage and 4 current inputs	Memory 256 MB Flash	digital inputs	digital outputs	Interfaces			Type	Item number
95...240V AC, 135...340V DC	44...130V AC, 48...180V DC	20...50V AC, 20...70V DC					RS 485	Ethernet 100baseT	Profibus DP V0		
●			●	●	8	5	●	●	●	UMG 511	52.19.001
	●		●	●	8	5	●	●	●	UMG 511	52.19.002
		●	●	●	8	5	●	●	●	UMG 511	52.19.003
Options (for all versions)											
Emax function application program (peak demand management)										Emax	52.16.080
BACnet communication										BACnet	52.16.081

- = not possible    ● = contained

General technical data		
Supply voltage L-N, AC		Refer to product variant overview
Overtoltage category		600V CATIII
Quadrants		4
Continuous measurement		yes
8 channel scanning rate	Per channel	20 kHz
Weight		1kg
Dimensions		L=144mm x W=144mm x H=81 mm
Mounting	According to IEC EN 60999-1/DIN EN 50022	Front panel mounting
Working temperature range		-10...50 °C
Connectable conductor (U/I)	Single wire, multi-wire, fine-wire	0,08 - 2,5 mm <sup>2</sup>
	pin cable lugs, ferrule	1,5 mm <sup>2</sup>
Protection class	According to EN 60529	IP 50 front /IP 20 rear

Measurement range		
L-N voltage, AC (without voltage transformer)	Free voltage transformer settings	5 ...500 VAC
L-L voltage, AC (without voltage transformer)	Free voltage transformer settings	8...870 VAC
Current (transformer: x/1 and x/5A)		0,005..6 A
Frequency of mains		40 ..70 Hz
Networks		TN, TT
Measurement in single/multi-phase networks		1 ph, 2 ph, 3 ph, 4 ph

Periphery		
Digital inputs	Status, logic or pulse input	8
Digital outputs	Switch logic output or pulse output	5
Password protection	Multilevel	yes
<b>Peak load management</b>	<b>Optional 64 channels</b>	<b>ja</b>
<b>Software</b>	<b>GridVis</b>	<b>ja</b>

Features		
Memory		256 MB
Clock		+/- 1 min per month
Integrated logic		Programming language Jasic®
Operating hour meter		yes
Weekly time switch		Jasic®



Measurement values		
Voltage	L1, L2, L3, L4, L1-L2, L2-L3, L1-L3	Accuracy $\pm 0.12\%$
Current	L1, L2, L3, L4	$\pm 0.2\%$
	Calculated sum current	$\pm 0.56\%$
K-factor	L1, L2, L3, L4	yes
Three-phase current components	Positive/ Negative/ Zero Phase Sequence	yes
Effective, reactive and apparent power	L1, L2, L3, L4, Sum L1-L3, Sum L1-L4	Accuracy $\pm 0.2\%$ acc. EN 61557-12:2008
Cos-phi, power factor	L1, L2, L3, L4, Sum L1-L3, Sum L1-L4	yes
Phase angle	L1, L2, L3, L4	yes
Effective energy (kWh)	L1, L2, L3, L4, Sum L1-L3, Sum L1-L4: - Purchased effective energy (tariff 1, tariff 2) - Supplied effective energy (tariff 1, tariff 2)	Class 0.2S (.../5A), Class 0.5S (.../1A)
	Reactive energy (kvarh)	L1, L2, L3, L4, Sum L1-L3, Sum L1-L4: - Inductive reactive power (tariff 1, tariff 2) - Capacitive reactive power
Apparent energy (kVAh)	L1, L2, L3, L4, Sum L1-L3, Sum L1-L4	yes
Current/voltage wave form	L1, L2, L3, L4	yes
Frequency of mains		Accuracy $\pm 0.01\%$
Average value		yes
Minimum and maximum values		yes

Power quality, Class A, according to EN61000-4-30		
Harmonics order, 1 <sup>st</sup> to 63 <sup>rd</sup> Harmonics, even/odd	Voltage L1, L2, L3, L4	Class 1 acc. EN61000-4-7
Interharmonics	Current, voltage L1, L2, L3, L4	yes
Distortion factor THD-U in %	L1, L2, L3, L4	yes
Distortion factor THD-I in %	L1, L2, L3, L4	yes
Positive/negative/zero system		yes
Actual flicker value	L1, L2, L3, L4	yes
Short-term flicker value	L1, L2, L3, L4	yes
Long-term flicker value	L1, L2, L3, L4	yes
Transients	50 $\mu$ s	yes
Trigger events	10 ms	yes
Inrush currents	10 ms	yes
Event recorder		yes

Communication		
<b>Interfaces</b>		
RS 485	9.6, 19.2, 38.4, 76.8, 115.2, 921.6 kbps	yes
Profibus DP	Plug, sub D 9-pole up to 12 Mbps	yes
Ethernet 10/100 Base- TX	RJ-45 sockets	yes
<b>Protocols</b>		
Modbus RTU		yes
Profibus DP V0		yes
Modbus TCP		yes
Modbus over TCP		yes
Modbus gateway		yes
HTTP	Homepage (configurable)	yes
SMTP	E-Mail	yes
SNMP		yes
SNTP	Time synchronisation	yes
TFTP	Automatic configuration	yes
FTP	File Transfer	yes
DHCP		yes
BACnet / IP or MSTP		yes, option