



## UMG 511 – Class A power quality analyser

according to IEC 61000-4-30

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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 63rd and inrush currents etc. Extensive communication possibilities e.g. RS 485 Modbus, Profibus, Ethernet (TCP/IP), BACnet, HTTP, FTP, SMTP, SNTP, 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

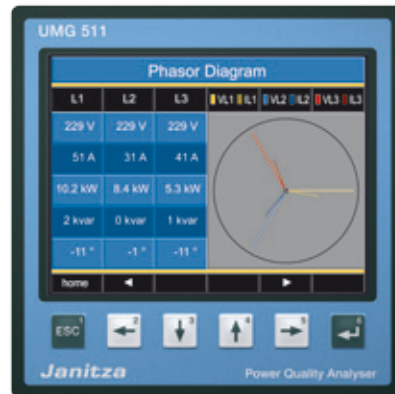
Various versions with UL-approval available!

# UMG 511

## Added value with additional functions

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 1st to 63rd 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 CAT III)
- 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®

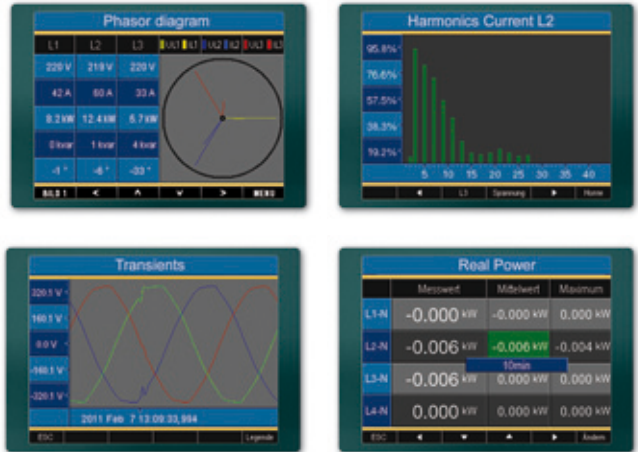
### Applications

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

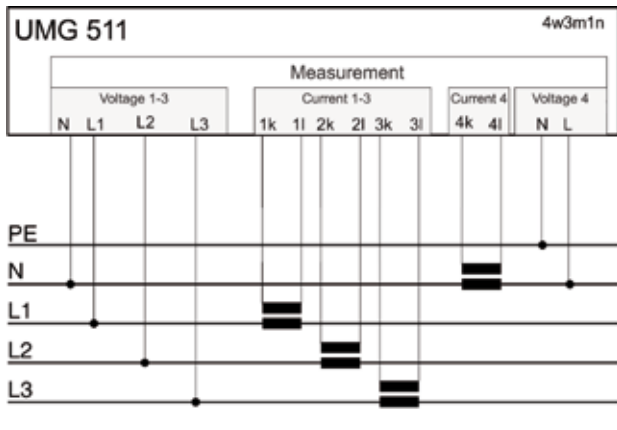
serves the UMG 511 as a reference voltage for harmonic measurement, transient and event recording and for the flicker meter. A nominal current can be set using this for the measurement of electrical current events. The 4th current and voltage input represents a separate measurement system. However, it 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 backlighted 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).



**Interfaces**

- Ethernet
- Profibus 485

**Networks**

- IT, TN, TT networks
- 3 phase and 4 phase networks

**8 digital inputs**

- Pulse input
- Logic input
- Status monitoring
- HT/LT switch over
- Emax (max. demand) resetting

**5 digital outputs**

- Pulse output kWh/kvarh
- Switch output
- Limit value output
- Emax output
- Logic output

(can be extended through external I/O modules)



**Communication**

- Profibus (DP/V0)
- Modbus (RTU, UDP, TCP, gateway)
- TCP/IP
- BACnet
- HTTP (freely configurable homepage)
- FTP (file transfer)
- TFTP (automatic configuration)
- NTP (time synchronisation)
- SMTP (e-mail function)
- DHCP
- SNMP

**Measurement accuracy**

- Class: 0.5S (.../5A) class
- Current: 0.2%
- Voltage: 0.2%

**Peak demand management**

- 64 stages for load shedding

**Memory**

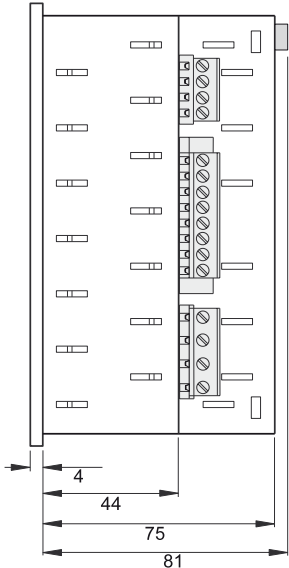
- 256 MByte Flash
- 16 Mbyte RAM

**Power quality**

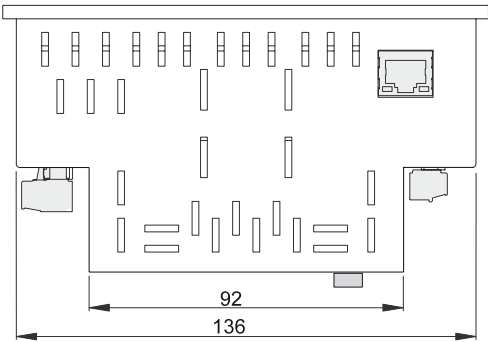
- Harmonics up to 63rd
- Short-term interruptions
- Transient recorder (>50µs)
- Starting current (>10ms)
- Unbalance
- Half wave-effective value recordings (up to 4.5 min)
- Flicker

programming language  
**Jasic®**

Dimensional drawing



Side view



All measurement data in mm

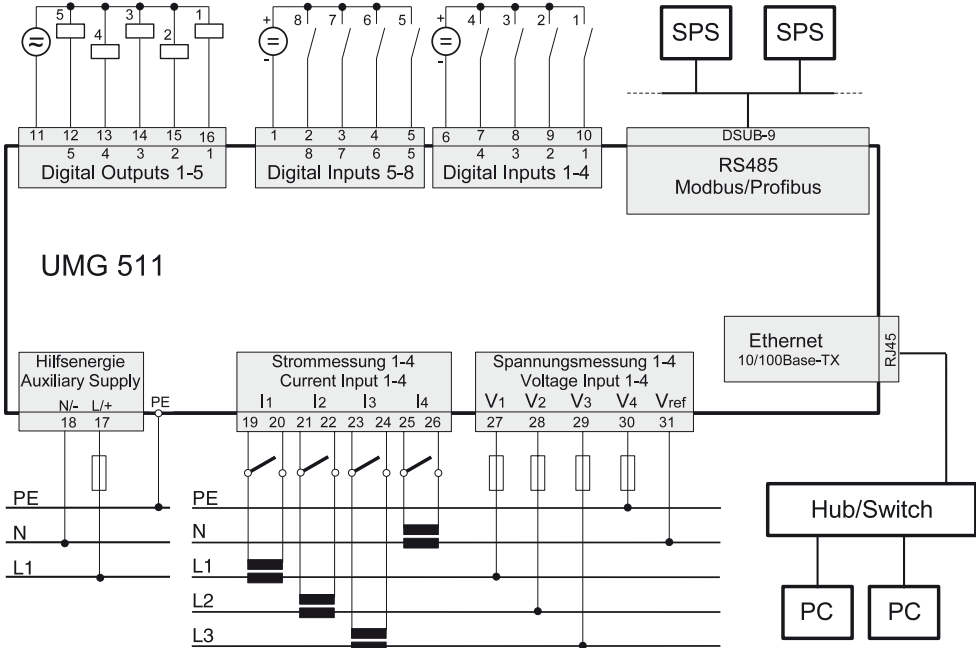
View from below

Connection illustration



Ethernet connection

Typical connection



## Product variants and technical data UMG 511

### Overview of product variants

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, 80...340V DC ±10% of nominal range	44...130V AC 48...180V DC ±10% of nominal range	20...50V AC 20...70V DC ±10% of nominal range					RS 485*	Ethernet 100baseT	Profibus DPV0			
•	-	-	•	•	8	5	•	•	•	UMG 511	<b>52.19.001</b>	
-	•	-	•	•	8	5	•	•	•	UMG 511	<b>52.19.002</b>	
-	-	•	•	•	8	5	•	•	•	UMG 511	<b>52.19.003</b>	
Options (for all versions)												
Emax function application program (peak demand management)									Emax		<b>52.19.080</b>	
BACnet communication									BACnet		<b>52.19.081</b>	

• = Contained - = Not possible \*1 x DSUB-9 connector

### General technical data

Nominal voltage	3-phase 4-wire grid (L-N, L-L) 3-phase 3-wire grid (L-L)	417/720 V AC +10% 600 V AC +10%
Overvoltage category		600 V CAT III
Quadrants		4
Continuous measurement		yes
8 channel scanning rate	Per channel	20 kHz
Weight		1 kg
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...55 °C
Connectable conductor (U/I)	Single wire, multi-wire, fine-wire pin cable lugs, ferrule	0.08 - 2.5 mm <sup>2</sup> 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	10...600 V AC rms
L-L voltage, AC (without voltage transformer)	Free voltage transformer settings	18...1000 V AC rms
Current (transformer: x/1 and x/5A)		0.005..6 A
Frequency of mains	(only for static frequency)	15...440 Hz
Networks		TN, TT, IT
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>yes</b>
<b>Software</b>	<b>GridVis</b>	<b>yes</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 ±0.1 %
Current	L1, L2, L3, L4 Calculated sum current	±0.2 % ±0.5%
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 40 ..70 Hz, cos-phi = 1 40 ..70 Hz, cos-phi = > 0.8 40 ..70 Hz, cos-phi = > 0.5 15 ..440 Hz, cos-phi = > 0.5	Accuracy ±(0.4% + 0.10%) ±(0.4% + 0.0075%) ±(0.5% + 0.0075%) ±(0.5% + 0.0075%) ±(3.0% + 0.0075%)
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	Class 2
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 ±0.1 %
Average value		yes
Minimum and maximum values		yes



## Product variants and technical data UMG 511

### Power quality

Harmonics order, 1 <sup>st</sup> to 63 <sup>rd</sup> Harmonics, even/odd	Voltage L1, L2, L3, L4	Accuracy ± 5% Accuracy ± 0.05
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 µs	yes
Trigger events	10 ms	yes
Inrush currents	10 ms	yes
Event recorder		yes,

### Communication

Inter- faces	RS 485	9.6, 19.2, 38.4, 57.6, 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
Protocols	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		yes, option