

UMG 511

Class A power quality analyser



Communication

- Profibus (DP/V0)
- Modbus (RTU, TCP, Gateway)
- TCP/IP
- BACnet (optional)
- HTTP (configurable homepage)
- FTP (file transfer)
- TFTP
- NTP (time synchronisation)
- SMTP (email function)
- DHCP
- SNMP

Interfaces

- Ethernet
- Profibus / RS485 (DSUB-9)

Accuracy of measurement

- Energy: Class 0.2S (... / 5 A)
- Current: 0.2 %
- Voltage: 0.1 %

Power quality acc. Class A

- Harmonics up to the 63rd harmonic
- Flicker measurement
- Short-term interruptions (> 10 ms)
- Transient recorder (> 50 µs)
- Starting currents (> 10 ms)
- Unbalance
- Half wave RMS recordings (up to 4.5 min.)

Networks

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

Measured data memory

- 256 MByte Flash

Programming language

- Graphical programming
- Jasic®
- PLC functionality

8 digital inputs

- Pulse input
- Logic input
- State monitoring
- HT / LT switching

5 digital outputs

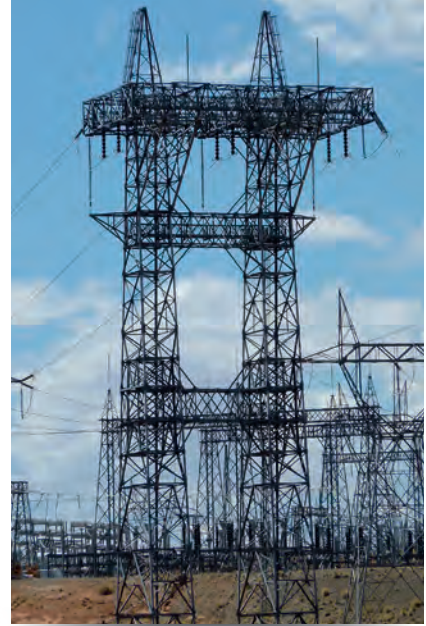
- Pulse output kWh / kvarh
- Switch output
- Threshold value output
- Logic output
- (expandable via external I/O modules)

Peak demand management (optional)

- Up to 64 switch-off stages

Network visualisation software

- Free GridVis®-Basic
- PQ Report Generator



Areas of application



- Continuous monitoring of the power quality
- Harmonics analysis with power quality problems
- Checking the internal supply network according to EN 61000-4-7, EN 6100-4-15, EN 61000-4-30
- Fault analysis in case of problems with the energy supply
- Documentation of the power quality for customers and regulatory authorities
- Ethernet Gateway for subordinate measurement points
- Report generator for power quality standards: EN 50160, IEE519, ITIC ...
- Report generator for energy consumptions
- Energy Dashboard
- Remote monitoring of critical processes

Main features



Power quality

- Harmonics analysis up to the 63rd harmonic, even / odd (U, I, P, Q)
- Interharmonics (U, I)
- Distortion factor THD-U / THD-I / TDD
- Measurement of positive, negative and zero sequence component
- Unbalance
- Direction of rotation field
- Voltage crest factor
- Flicker measurement in accordance with DIN EN 61000-4-15
- Logging and storage of transients ($> 50 \mu\text{s}$)
- Short-term interruptions ($> 10 \text{ ms}$)
- Monitoring start-up processes

High quality measurement

- Constant true RMS measurement
- Measurement process in accordance with IEC 61000-4-30
- Certified accuracy of measurement according to class A
- Continuous sampling of the voltage and current measurement inputs at 20,000 Hz
- 400 measurement points per period
- Recording of over 2,000 measured values per measurement cycle
- Accuracy of active energy measurement: Class 0.2S
- Fast measurement even enables the logging of rapid transients from $50 \mu\text{s}$
- Logging of currents and voltages (15 – 440 Hz)



User-friendly, colour graphical display with intuitive user guidance

- High resolution colour graphical display 320 x 240, 256 colours, 6 buttons
- User-friendly, self-explanatory and intuitive operation
- Backlight for optimum reading, even in darker environments
- Illustration of measured values in numeric form, as a bar graph or line graph
- Clear and informative representation of online graphs and power quality events
- Multilingual: German, English, Russian, Spanish, Chinese, French, Japanese, Turkish ...

Various characteristics

- 4 voltage and 4 current measurement inputs, i.e. logging of N and / or PE possible
- 8 digital inputs, e.g. as data logger for S0 meter
- 5 digital outputs for alarm message or e.g. for connection to a BMS or PLC
- Free name assignment for the digital IOs, e.g. if used as data logger

Comprehensive communication and connection possibilities

- Modbus
- Profibus
- Ethernet (TCP/IP)
- Digital IOs
- BACnet (optional)
- Configurable Firewall



Modern communications architecture via Ethernet

- Simple integration in an Ethernet network
- Reliable and cost-optimised establishment of communication
- Ideal for Master-Slave structures
- High flexibility due to the use of open standards
- Integration in PLC systems and BMS through additional interfaces
- Various IP protocols: SNMP, ICMP (Ping), NTP, FTP ...

Transients (1..8)		
Phase	Reason	Date/Time
L1	delta	2011 Mar 16 16:33:07,122
L4	delta	2011 Mar 16 16:32:29,826
L3	delta	2011 Mar 16 16:32:29,819
L2	delta	2011 Mar 16 16:32:29,813
L2	delta	2011 Mar 16 16:32:29,806
L1	delta	2011 Mar 16 16:32:29,799
L4	delta	2011 Mar 16 16:32:29,793
L3	delta	2011 Mar 16 16:32:29,786

Fig.: Transients list

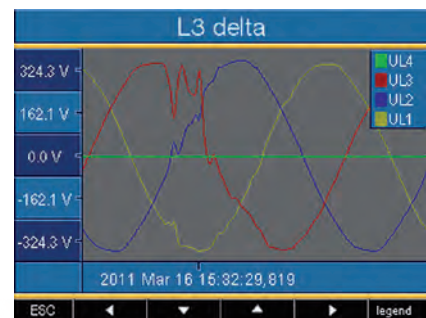


Fig.: Graphical representation of a transient



Measuring device homepage

- Web server on the measuring device, i.e. device's inbuilt homepage
- Function expansion possible through APPs
- Remote operation of the device display via the homepage
- Comprehensive measurement data incl. PQ (transients, events...)
- Online data directly available via the homepage, historic data optional via the APP measured value monitor, 51.00.245



Fig.: Illustration of the historic data via the homepage



BACnet protocol for building communication

- Optimal interoperability between devices from various manufacturers
- Predefined BIBBs (BACnet Interoperability Building Block)
- BACnet is optionally available with UMG 511
- UMG 511 supports the device type B-SA with the BIBBs DS-RP-B and DS-WP-B
- Furthermore, the BIBBs DS-COV-B and DM-UTC-B are also supported

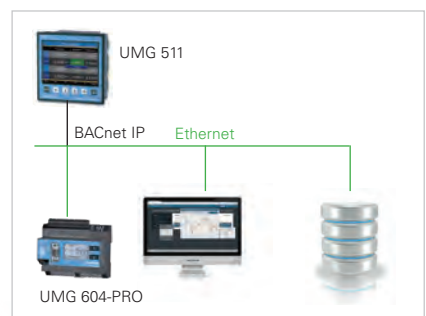


Fig.: BACnet topology



Modbus Gateway function

- Economical connection of subordinate measuring devices without Ethernet interface
- Integration of devices with Modbus-RTU interface possible (harmonisation of data format and function code necessary)
- Data can be scaled and described
- Minimised number of IP addresses required
- Tried and tested integrated solution without additional hardware



Programming / PLC functionality

- Further processing of the measurement data in the measuring device (local intelligence)
- Monitoring and alarm functions simple to program
- Sustainable functional expansions far beyond pure measurement
- Comprehensive programming options with
 - Jasic® source code programming
 - Graphical programming
- Complete APPs from the Janitza library



Large measurement data memory

- 256 MB data memory
- Memory range up to 2 years (configuration-dependent)
- Individually configurable recordings

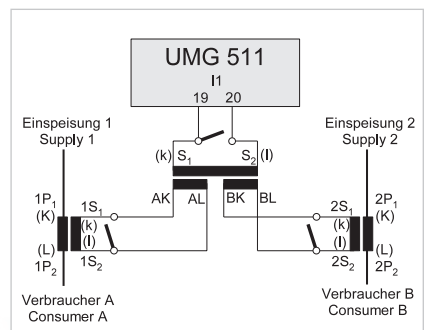


Fig.: Example, current measurement via a summation current transformer

- Recording averaging times can be freely selected
- PQ recordings template preconfigured for conventional standards (e.g. EN 50160)
- User-defined memory segmenting possible



Powerful alarm management

- Information available immediately by email
- Inform maintenance personnel via the powerful device homepage
- Via digital outputs, Modbus addresses, GridVis® software
- Programming via Jasic® or graphical programming
- Further alarm management functions via GridVis®-Service alarm management



Peak load representation and peak load management

- Illustration of the 3 highest monthly power peaks on the LCD display (P, Q, S)
- Rolling bar chart representation of the peak power values over 3 years on the LCD display (P, Q, S)
- Plain text representation on the LCD display (P)



GridVis®-Basic power quality analysis software

- Multilingual
- Manual read-out of the measuring devices
- Manual report generation (power quality and energy consumption reports)
- Comprehensive PQ analysis with individual graphs
 - Online graphs
 - Historic graphs
 - Graph sets
- Integrated databases (Janitza DB, Derby DB)
- Graphical programming
- Topology views
- High memory range

Certified quality through independent institutes

- ISO 9001
- Energy management certified according to ISO 50001
- Class A certificate (IEC 61000-4-30)
- UL certificate
- EMC-tested product



Fig.: Large measurement data memory

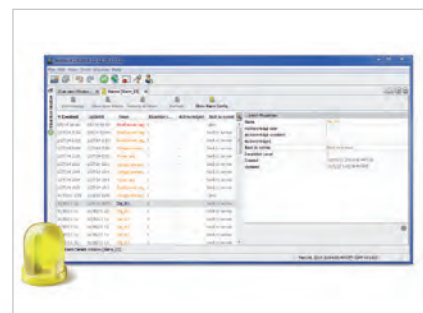


Fig.: GridVis® alarm management, alarm list (logbook)

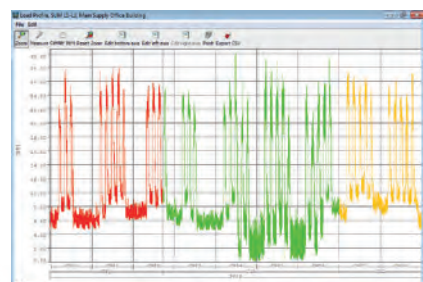


Fig.: GridVis® load profile, asic instrument for EnMS

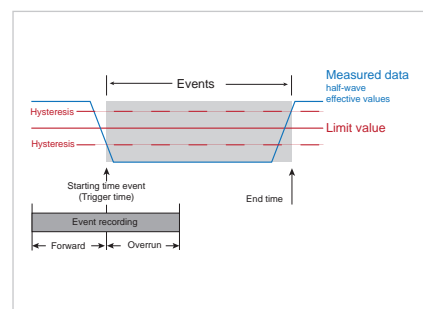
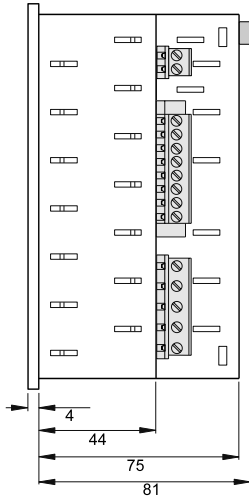


Fig.: The event record consists of a mean value, a minimum or maximum value, a start time and an end time.

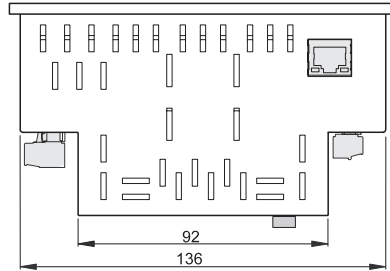


Dimension diagrams

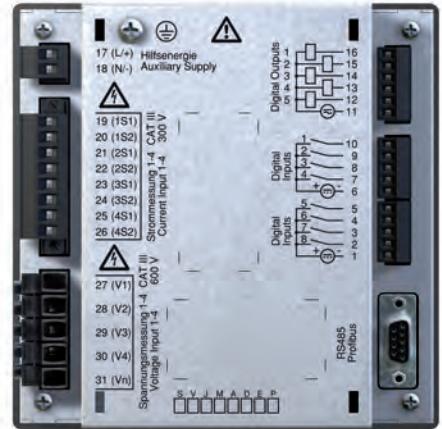
All dimensions in mm



Side view



View from below

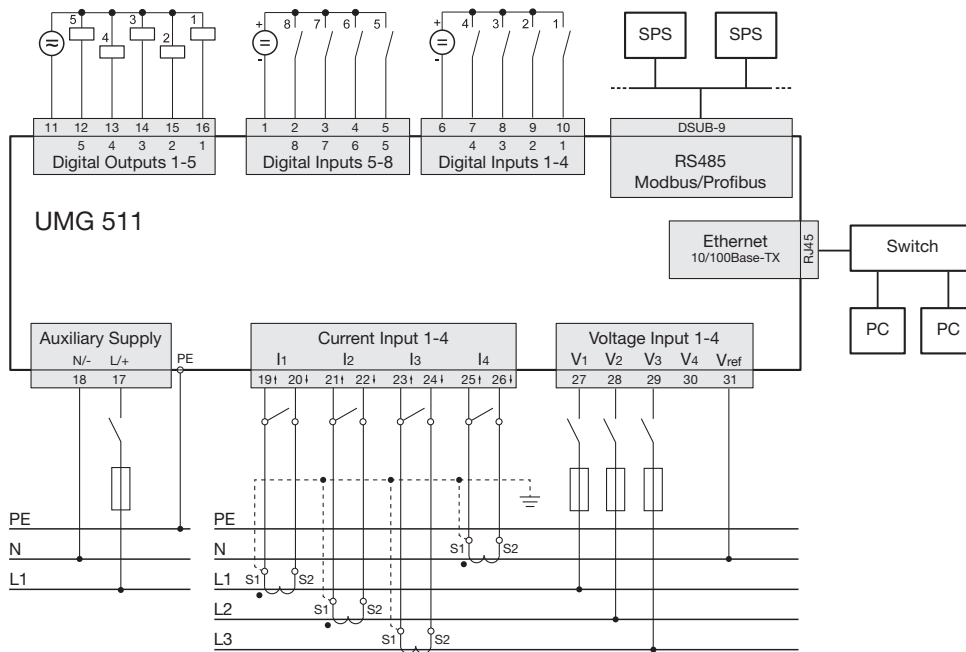


Rear view

Cut out: 138^{+0,8} x 138^{+0,8} mm



Typical connection





Device overview and technical data

UMG 511		
Item number	52.19.001	52.19.002
AC supply voltage	95 to 240 V AC	44 to 130 V AC
Supply voltage DC	80 to 340 V DC	48 to 180 V DC
Item number (UL)	52.19.011	52.19.012
AC supply voltage	95 to 240 V AC	44 to 130 V AC
Supply voltage DC	80 to 280 V DC	48 to 180 V DC
Device options		
BACnet communication	52.19.081	52.19.081

General	
Net weight	1080 g
Device dimensions	approx. l = 144 mm, w = 144 mm, h = 75 mm
Battery	Type VARTA CR1/2AA, 3 V, Li-Mn

Transport and storage	
The following information applies to devices which are transported or stored in the original packaging.	
Free fall	1 m
Temperature	-20° C to +70° C

Ambient conditions during operation	
The UMG511 is intended for weather-protected, stationary use.	
The UMG511 must be connected to the ground wire connection! Protection class I in acc. with IEC 60536 (VDE 0106, Part 1).	
Working temperature range	-10° C to +55° C
Relative humidity	5 to 95%, (at +25° C) without condensation
Pollution degree	2
Operating altitude	0 to 2000 m above sea level
Installation position	any
Ventilation	forced ventilation is not required.
Protection against ingress of solid foreign bodies and water	
- Front	IP50 in acc. with EN60529
- Rear	IP20 in acc. with EN60529

Supply voltage	
Installations of overvoltage category	300 V CAT III
Protection of the supply voltage (fuse)	6 A, char. B (approved i.a.w. UL/IEC)
230 V option (item no. 52.19.001)	
- Nominal range:	95 V to 240 V (45–65 Hz) or DC 80 V to 340 V
- Operating range:	+6% /-10% of nominal range
- Power consumption:	max. 10 W, max. 15 VA
90 V option (item no. 52.19.002)	
- Nominal range:	44 V to 130 V (45–65 Hz) or DC 48 V to 180 V
- Operating range:	± 10% of nominal range
- Power consumption:	max. 6 W, max. 9 VA

Terminal connection capacity (supply voltage)	
Connectable conductors. Only one conductor can be connected per terminal!	
Single core, multi-core, fine-stranded	0.2 – 2.5 mm ² , AWG 24 - 12
Terminal pins, core end sheath	0.25 – 2.5 mm ²
Tightening torque	0.5 – 0.6 Nm
Stripping length	7 mm

Inputs and outputs	
8 digital inputs	
- Maximum count frequency	20 Hz
- Response time (Jasic program)	200 ms
- Input signal present	18 V to 28 V DC (typical 4 mA)
- Input signal not present	0 to 5 V DC, current less than 0.5 mA
5 digital outputs, semiconductor relays, not short-circuit proof.	
Switching voltage	max. 60 V DC, 30 V AC
Switching current	max. 50 mA _{eff} AC/DC
Response time (Jasic program)	200 ms
Output of voltage dips	20 ms
Output of voltage exceedance events	20 ms
Pulse output (work pulse)	max. 20 Hz
Cable length	
	up to 30 m unshielded, from 30 m shielded

Terminal connection capacity (inputs and outputs)	
Rigid/flexible	0.14 – 1.5 mm ² , AWG 28-16
Flexible with core end sheath without plastic sleeve	0.25 – 1.5 mm ²
Flexible with core end sheath with plastic sleeve	0.25 – 0.5 mm ²
Tightening torque	0.22 – 0.25 Nm
Stripping length	7 mm

Voltage measurement	
The voltage measurement inputs are suitable for measurements in the following power supply systems:	
Three-phase 4-conductor systems with rated voltages up to	417 V/720 V (+10%)
Three-phase 3-conductor systems with rated voltages up to	600 V (+10%)
From a safety and reliability perspective, the voltage measurement inputs are designed as follows:	
Overvoltage category	600 V CAT III
Measurement voltage surge	6 kV
Metering range L-N	0 ¹⁾ to 600 V _{rms}
Metering range L-L	0 ¹⁾ to 1000 V _{rms}
Resolution	0.01 V
Crest factor	1.6 (related to 600 V _{rms})
Impedance	4 MOhm/phase
Power consumption	approx. 0.1 VA
Sampling rate	20 kHz / phase
Transients	50 µs
U _{din} ²⁾ as per EN61000-4-30	100 to 250 V
Flicker range (dU/U)	27.5%
Frequency of the fundamental oscillation	15 Hz to 440 Hz
- Resolution	0.001 Hz

1) The UMG 511 can only determine measured values, if an L-N voltage of greater than 10 V_{eff} or an L-L voltage of greater than 18 V_{eff} is applied to at least one voltage measurement input.

2) U_{din} = arranged input voltage according to DIN EN 61000-4-30

Current measurement	
Rated current	5 A
Resolution	0.1 mA
Metering range	0.001 to 7.4 A _{rms}
Crest factor	2.4
Overvoltage category	300 V CAT III
Measurement voltage surge	4 kV
Power consumption	approx. 0.2 VA (Ri = 5 mOhm)
Overload for 1 sec.	120 A (sinusoidal)
Sampling rate	20 kHz

Terminal connection capacity (voltage and current measurement)	
Connectable conductors. Only one conductor can be connected per terminal!	
Single core, multi-core, fine-stranded	0.2 – 2.5 mm ² , AWG 24-12
Terminal pins, core end sheath	0.25 – 2.5 mm ²
Tightening torque	0.5 – 0.6 Nm
Stripping length	7 mm

Firmware	
Firmware update	Update via GridVis®software. Firmware download (free of charge) from the website: www.janitza.com

Comment: For detailed technical information please refer to the operation manual and the Modbus address list.

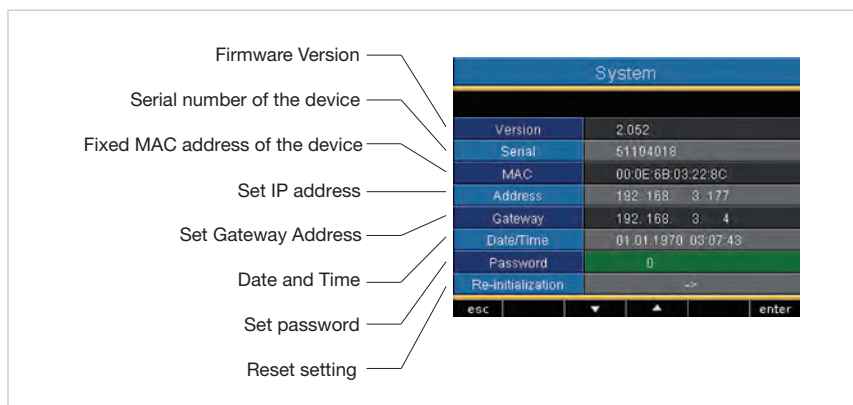


Fig.: User-friendly system of IP addresses, date, time and password

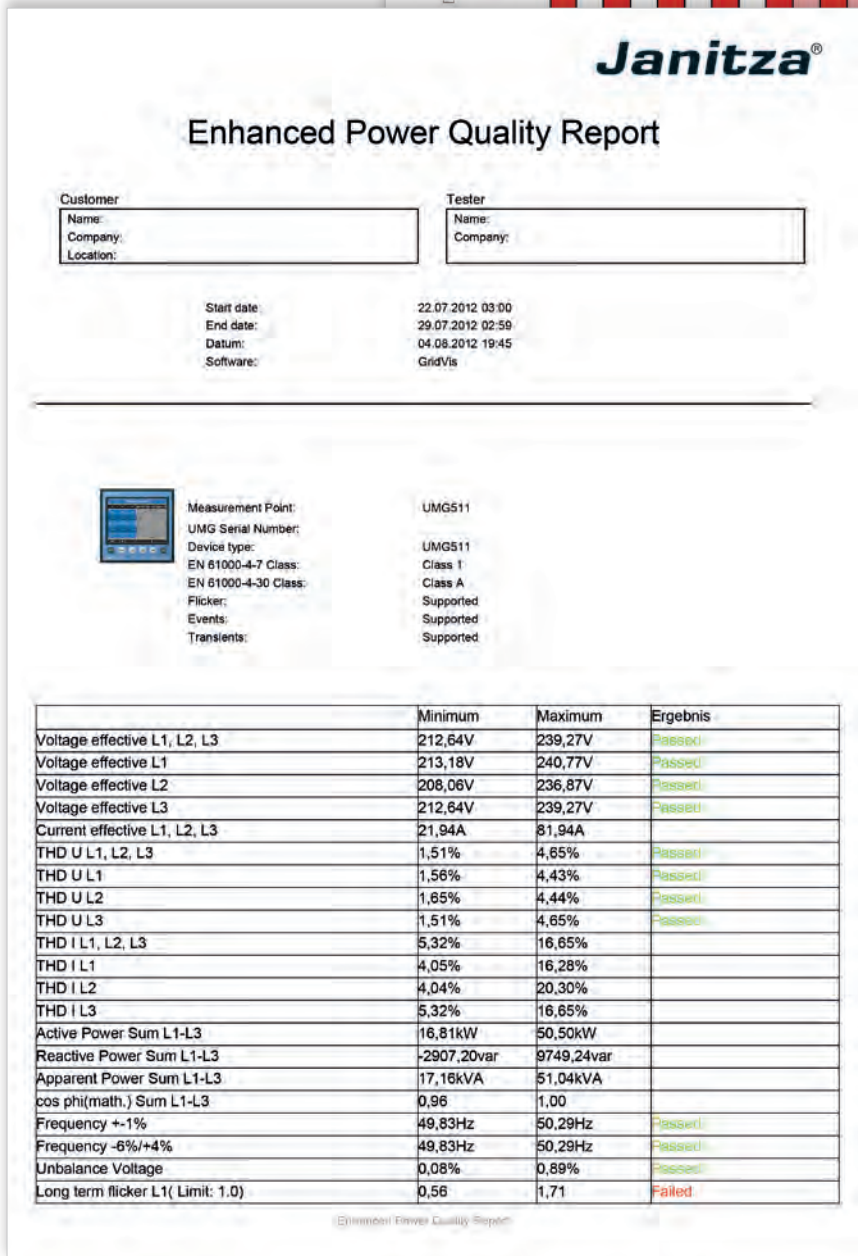
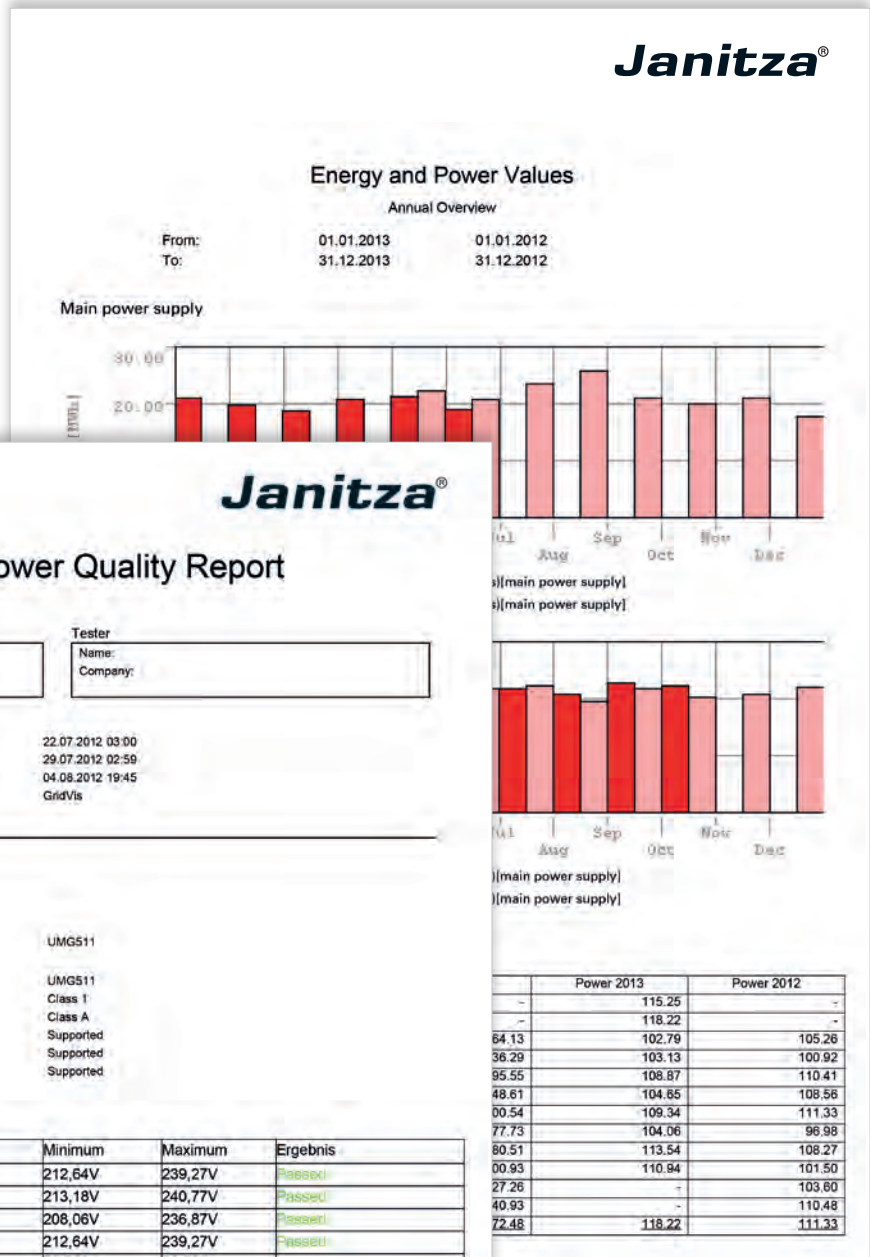


Fig.: Automatically generated power quality and energy report