

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 15:33:07,122 |
| L4 | delta | 2011 Mar 16 15:32:29,826 |
| L3 | delta | 2011 Mar 16 15:32:29,819 |
| L2 | delta | 2011 Mar 16 15:32:29,813 |
| L2 | delta | 2011 Mar 16 15:32:29,806 |
| L1 | delta | 2011 Mar 16 15:32:29,799 |
| L4 | delta | 2011 Mar 16 15:32:29,793 |
| L3 | delta | 2011 Mar 16 15:32:29,786 |

Fig.: Transients list

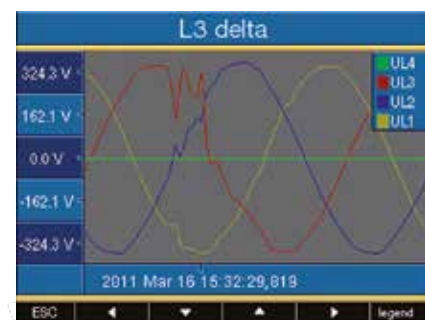


Fig.: Graphical representation of a transient



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

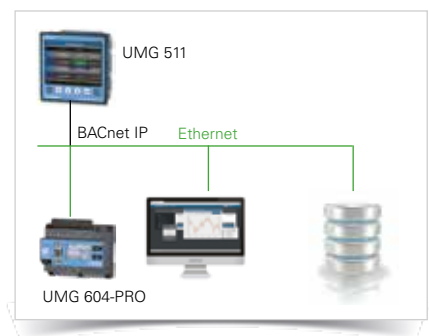


Fig.: BACnet topology



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

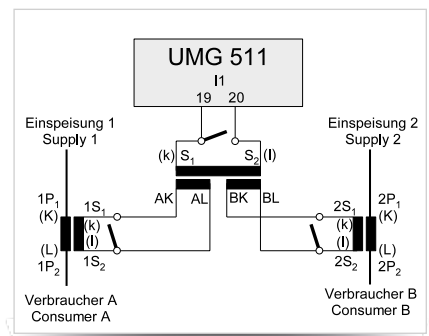


Fig.: Example, current measurement via a summation current transformer

- 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)

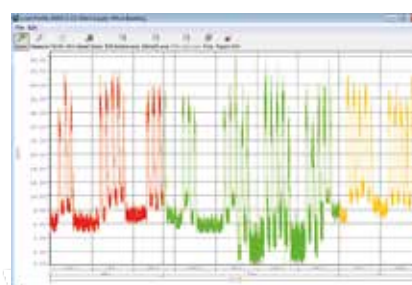


Fig.: GridVis® load profile, asic instrument for EnMS

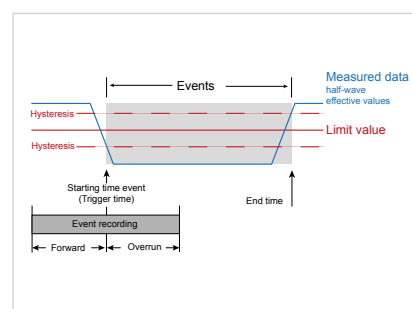
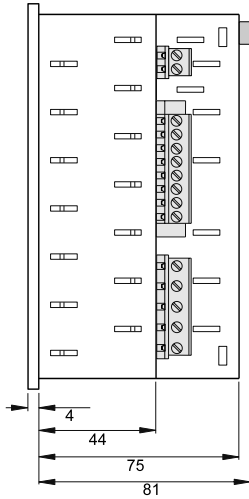


Fig.: The event record consists of a mean value, a minimum or maximum value, a start time and an end time.

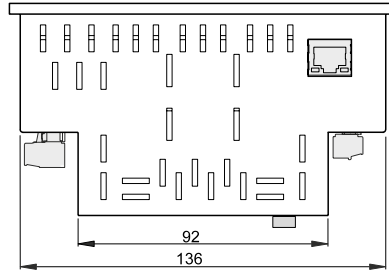


Dimension diagrams

All dimensions in mm



Side view



View from below

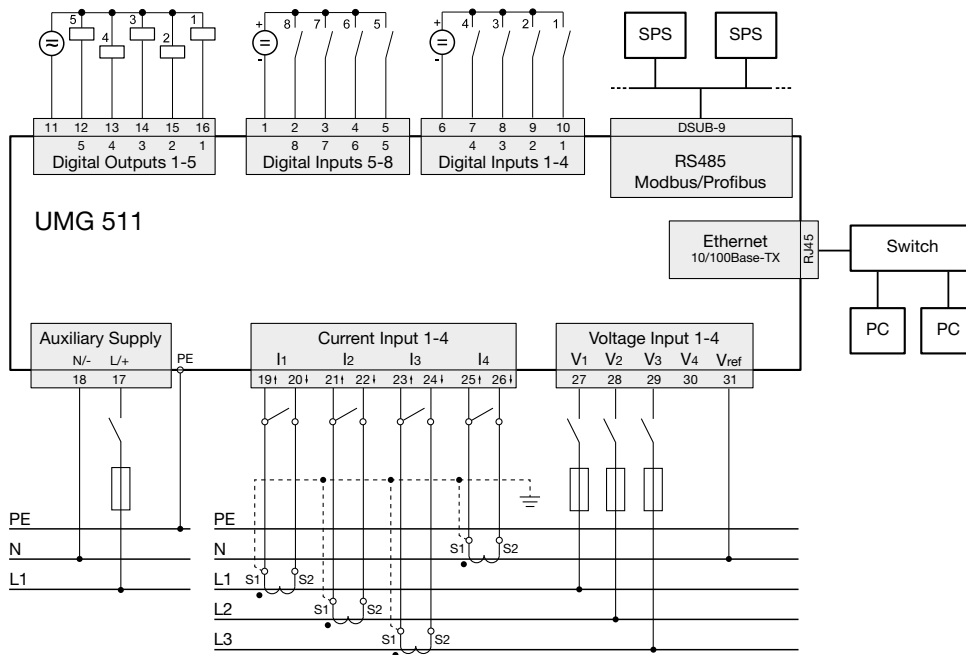


Rear view

Cut out: $138^{+0.8} \times 138^{+0.8}$ 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 | | |
| Emax function (peak load optimisation) | 52.19.080 | 52.19.080 |
| 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: http://www.janitza.com |

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

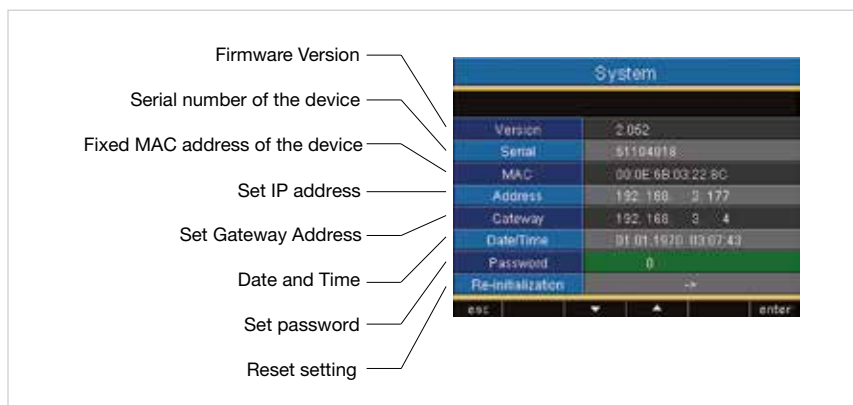


Fig.: User-friendly system of IP addresses, date, time and password

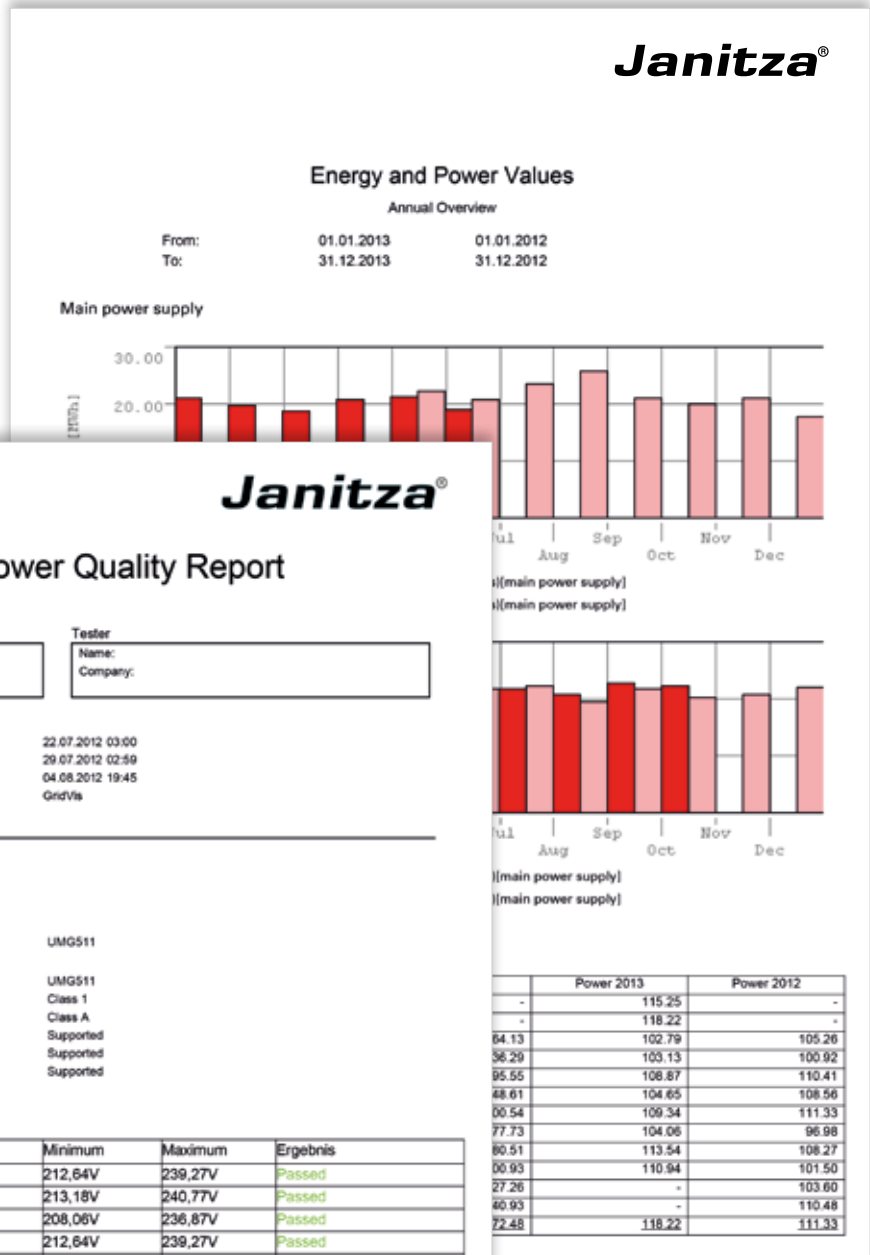


Fig.: Automatically generated power quality and energy report