Harmonics

Modbus interface

GridVis®
Analysis software

Measurement accuracy 0.5

UMG 103 – Universal measurement device for DIN rails

Communication
- Protocols: Modbus RTU / Slave

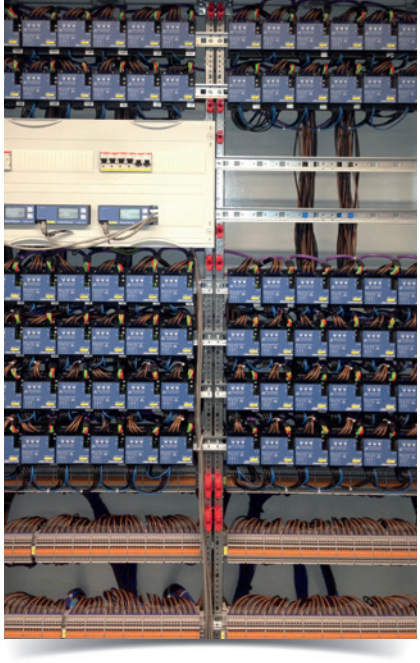
Interface
- RS485

Accuracy of measurement
- Energy: Class 0.5S (... / 5 A)
- Current: 0.5 %
- Voltage: 0.2 %

Power quality
- Harmonics up to 25th order, odd harmonics
- Unbalance
- Distortion factor THD-U
- Distortion factor THD-I

Networks
- TN, TT networks

Network visualisation software
- GridVis®-Basic (in the scope of supply)



Areas of application

- Measurement and checking of electrical characteristics and energy consumption in energy distribution systems
- Cost centre management
- Threshold value monitoring, measured value transducer for building management systems or PLC
- Monitoring of harmonics

Main features

Power quality

- Harmonics analysis up to 25th harmonic, odd harmonics
- Unbalance
- Distortion factor THD-U / THD-I
- Minimum and maximum values
- Measurement of positive, negative and zero sequence component

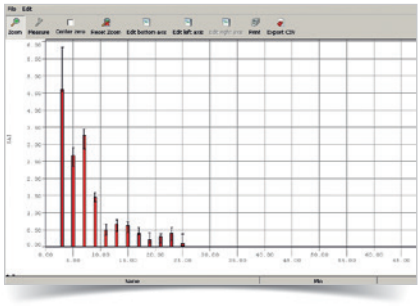


Fig.: GridVis® – Harmonics analysis (FFT)

Features

- 3 Voltage measurement inputs (300 V CATIII)
- 3 Current measurement inputs
- 3-Phase or 3 x Single-Phase-Measurement possible
- Continuous sampling of voltage and current measurement inputs
- Measurement of the reactive distortion power
- Sampling frequency 5.4 kHz
- Transfer of the measured values via a serial interface
- Supply voltage via measurement voltage L1-N, L2-N and L3-N

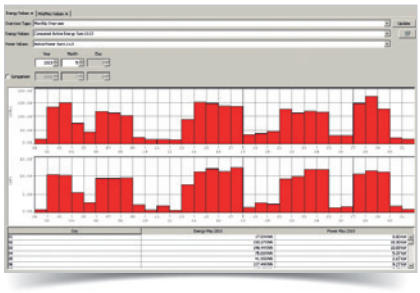
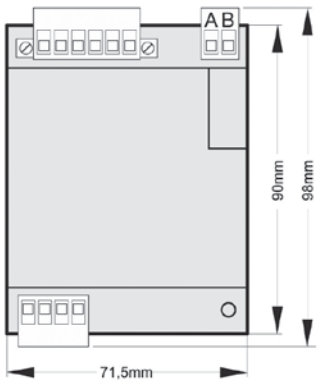


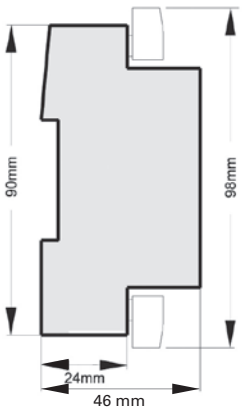
Fig.: GridVis® – Device dashboard with energy analysis

Dimension diagrams

All dimensions in mm

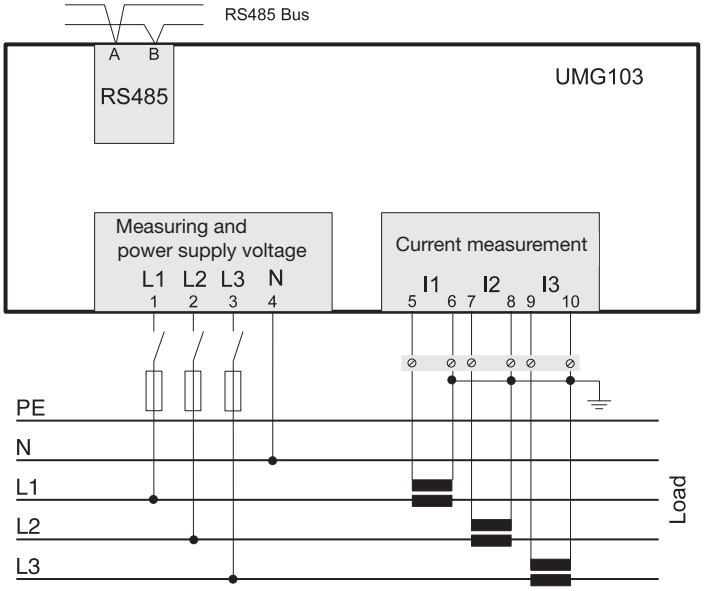


Front view



Side view

Typical connection



Device overview and technical data

	UMG 103
Item number	**52.18.001**
Item number (UL)	**52.18.011*1**
Measured voltage (L-N/L-L)	240 / 415 V AC *1
Operating voltage (from 3-phase network)	80 ... 240 V AC

General	
Use in low and medium voltage networks	•
Accuracy voltage measurement	0.2 %
Accuracy current measurement	0.5 %
Accuracy active energy (kWh, .../5 A)	Class 0.5S
Number of measurement points per period	108
Uninterrupted measurement	•
RMS - momentary value	
Current, voltage, frequency	•
Active, reactive and apparent power / total and per phase	•
Power factor / total and per phase	•
Energy measurement	
Active, reactive and apparent energy [L1,L2,L3, ∑ L1-L3]	•
Number of tariffs	4
Recording of the mean values	
Voltage, current / actual and maximum	•
Active, reactive and apparent power / actual and maximum	•
Frequency / actual and maximum	•
Demand calculation mode (bi-metallic function) / thermal	•

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

• = included - = not included

*1 UMG 103 (UL) item number 52.18.011: Rated voltage L-N 100 ... 127 V AC; Metering range L-N 25 ... 127 V AC; Metering range L-L 44 ... 240 V AC.

Other measurements	
Operating hours measurement	•
Power quality measurements	
Harmonics per order / current	1st – 25th
Harmonics per order / voltage	1st – 25th
Distortion factor THD-U in %	•
Distortion factor THD-I in %	•
Current and voltage, positive, zero and negative sequence component	•
Measured data recording	
Online readout with GridVis®	•
Average, minimum, maximum values	•
Voltage and current inputs	each 3
Communication	
Interfaces	
RS485: Autobaud, 9.6 – 115.22 kbps (Screw-type terminal)	•
Protocols	
Modbus RTU	•
Software GridVis®-Basic*2	
Online graphs	•
Databases (Janitza DB, Derby DB); MySQL, MS SQL with higher GridVis® versions)	•
Manual reports (energy, power quality)	•
Topology views	•
Manual read-out of the measuring devices	•
Graph sets	•
Programming / threshold values / alarm management	
Comparator (2 Groups with 3 comparators each)	•

Technical data	
Type of measurement	Constant true RMS up to 25th harmonic
Nominal voltage, three-phase, 4-conductor (L-N, L-L)	240 / 415 V AC *3
Measurement in quadrants	4
Networks	TN, TT
Measured voltage input	
Overvoltage category	300 V CAT III or 150 V CAT III (UL)
Measured range, voltage L-N, AC (without potential transformer)	80 ... 240 Vrms
Measured range, voltage L-L, AC (without potential transformer)	80 ... 415 Vrms
Resolution	0.01 V
Frequency measuring range	45 ... 65 Hz
Power consumption	max. 4 VA
Sampling frequency	5.4 kHz / phase
Measured current input	
Rated current	1 / 5 A
Resolution	0.1 mA
Measurement range	0.001 ... 6 Amps
Overvoltage category	300 V CAT III
Measurement surge voltage	4 kV
Power consumption	approx. 0.2 VA (Ri = 5 MOhm)
Overload for 1 sec.	60 A (sinusoidal)
Sampling frequency	5.4 kHz / phase
Mechanical properties	
Weight	150 g
Device dimensions in mm (H x W x D)	approx. 98 x 71.5 x 46
Protection class per EN 60529	IP20
Assembly per IEC EN 60999-1 / DIN EN 50022	35-mm DIN rail
Connecting phase (U / I), Single core, multi-core, fine-stranded Terminal pins, core end sheath	 0.08 to 2.5 mm² 1.5 mm²
Environmental conditions	
Temperature range	Operation: K55 (-10 ... +55 °C)
Relative humidity	Operation: 5 to 95 % (at 25 °C)
Operating height	0 ... 2,000 m above sea level
Degree of pollution	2
Installation position	user-defined

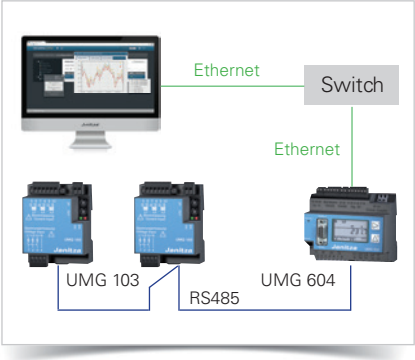


Fig.: Connection of multiple UMG 103s to a PC via a UMG 604 (with Ethernet option)

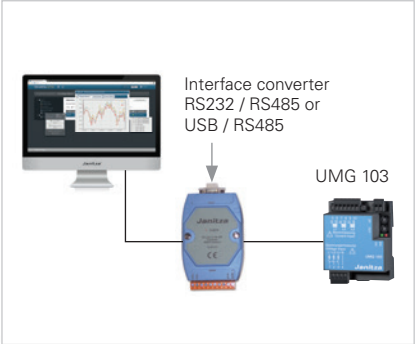


Fig.: Connection of a UMG 103 to a PC via an interface converter

*2 Optional additional functions with the packages GridVis®-Professional, GridVis®-Enterprise and GridVis®-Service.
*3 UMG 103UL Item number 52.18.011: Nominal voltage, three-phase, 4-conductor (L-N, L-L): 127 / 220 V AC

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

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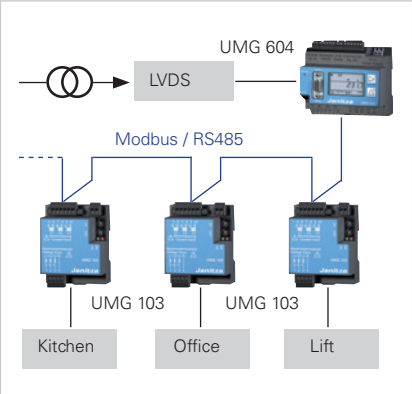

Fig.: Topology example UMG 604 (Master) – UMG 103 (Slave)

Electromagnetic compatibility	
Electromagnetic compatibility of electrical equipment	Directive 2004/108/EC
Electrical appliances for application within particular voltage limits	Directive 2006/95/EC
Equipment safety	
Safety requirements for electrical equipment for measurement, regulation, control and laboratory use – Part 1: General requirements	IEC/EN 61010-1
Part 2-030: Particular requirements for testing and measuring circuits	IEC/EN 61010-2-030
Noise immunity	
Industrial environment	IEC/EN 61326-1
Electrostatic discharge	IEC/EN 61000-4-2
Voltage dips	IEC/EN 61000-4-11
Emissions	
Class A: Residential environment	IEC/EN 61326-1
RFI Field Strength 30 – 1,000 MHz	IEC/CISPR11/EN 55011
Radiated interference voltage 0.15 – 30 MHz	IEC/CISPR11/EN 55011
Safety	
Europe	CE labelling
USA and Canada	UL variants available
Firmware	
Firmware update	Update via GridVis® software. Firmware download (free of charge) from the website: http://www.janitza.com/downloads/

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

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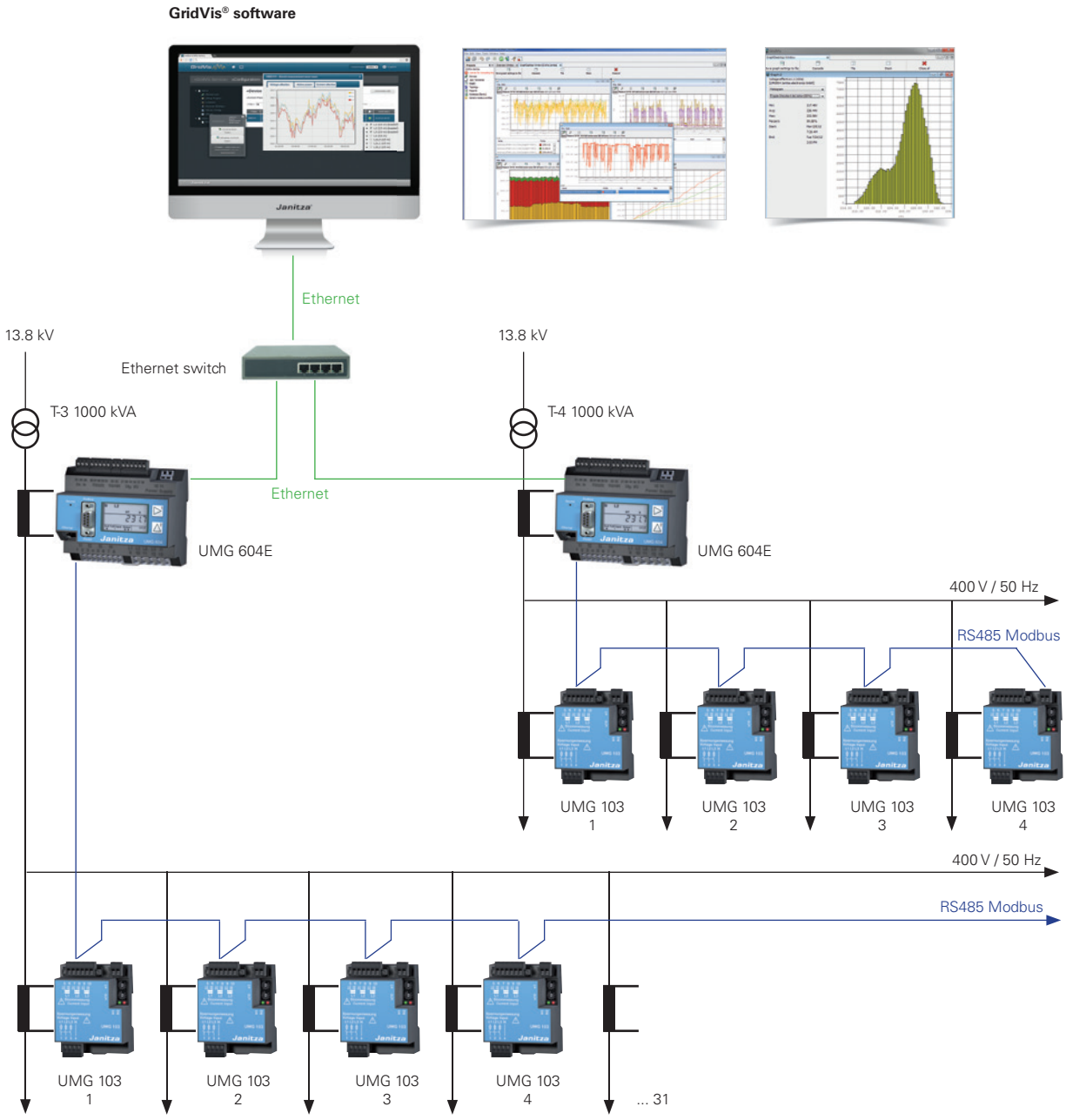

Fig.: Typical application illustration with 2 supplies, UMG 604 as master measurement device in the main power supply and UMG 103 for measuring the low voltage feeder.

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