UMG 96RM-E

Multifunctional power analyzer

for panel mounting 96 x 96 mm

MÜLLER ZIEGLER Elektrische Messgeräte

Interfaces
- RS485
- Ethernet

Communication
- Modbus (RTU, TCP, Gateway)
- HTTP (configurable homepage)
- FTP (File-Transfer)
- SNMP, NTP (time synchronisation)
- SMTP (email function)
- DHCP, SNTP, TFTP
- BACnet (optional)

Power quality
- Harmonics up to 40th harmonic
- Rotary field components
- Distortion factor THD-U/THD-I

Measured data memory
- 256 MB flash

Thermistor input
- PT100, PT1000, KTY83, KTY84

Accuracy of measurement
- Energy: class 0,5S (.../5 A)
- Current and voltage: 0,2%

Inputs / outputs
- 3 digital inputs or outputs
- 2 analog inputs (temperature)
- 2 digital outputs

Networks
- TN-, TT-, IT-networks
- 3- and 4-phase networks
- up to 4 single-phase networks

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made in germany

Version 23.03.01 • Technical changes reserved.
The current status of the brochure is available at www.mueller-ziegler.de.

Application

The multifunctional power analyzer UMG 96RM-E is used to measure, monitor and control electrical parameters in energy distribution systems. The recording of load profiles (in energy management systems) are just as much a task of the device as the recording of energy consumption for cost center analysis. A residual current monitoring is integrated.

Special features

• Measurement, monitoring and checking of electrical characteristics in energy distribution systems	• Residual current monitoring (RCM)
• Recording of load profiles in energy management systems (e.g. ISO 50001)	• Monitoring of power quality characteristics, e.g. harmonics up to 40th harmonic
• Acquisition of the energy consumption for cost centre analysis	• Measured value transducer for building management systems or PLC (Modbus)

Main features

Universal meter

- Operating current monitoring for general electrical parameters
- High transparency through a multi-stage and scalable measurement system in the field of energy measurement
- Acquisition of events through continuous measurement with 200 ms high resolution

RCM device

- Continuous monitoring of residual currents (Residual Current Monitor, RCM)
- Alarming in case a preset threshold fault current reached
- Near-realtime reactions for triggering countermeasures
- Permanent RCM measurement for systems in permanent operation without the opportunity to switch off

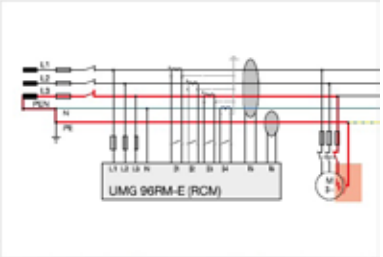

Fig.: UMG 96RM-E with residual current monitoring via measuring inputs I5 / I6

Energy measurement device

- Continuous acquisition of the energy data and load profiles
- Essential both in relation to energy efficiency and for the safe design of power distribution systems

Harmonics analyser / event recorder

- Analysis of individual harmonics for current and voltage
- Prevention of production downtimes
- Significantly longer service life for equipment
- Rapid identification and analysis of power quality fluctuations by means of user-friendly tools (GridVis®)

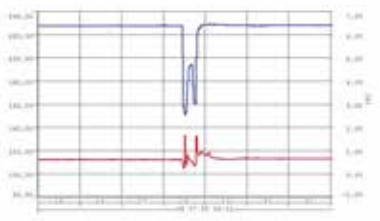

Fig.: Event logger: Voltage dip in the low voltage distribution system

Extensive selection of tariffs

- 7 tariffs each for effective energy (consumption, delivery and without backstop)
- 7 tariffs each for reactive energy (inductive, capacitive and without backstop)
- 7 tariffs for apparent energy
- L1, L2 and L3, for each phase

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Highest possible degree of reliability

- Continuous leakage current measurement
- Historical data: Long-term monitoring of the residual current allows changes to be identified in good time, e.g. insulation faults
- Time characteristics: Recognition of time relationships
- Prevention of neutral conductor carryover
- RCM threshold values can be optimized for each individual case: Fixed, dynamic and stepped RCM threshold value
- Monitoring of the CGP (central ground point) and the subdistribution panels

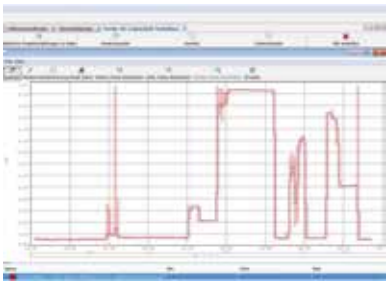


Fig.: Continuous leakage current measurement

Analysis of fault current events

- Event list with time stamp and values
- Presentation of fault currents with characteristic and duration
- Reproduction of phase currents during the fault current surge
- Presentation of the phase voltages during the fault current surge

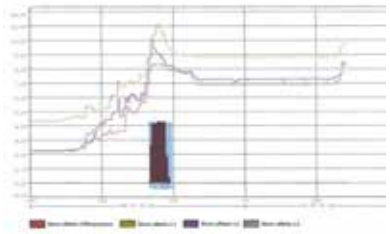


Fig.: Analysis of fault current events

Analysis of the harmonic fault current components

- Frequencies of the fault currents (fault type)
- Current peaks of the individual frequency components in A and %
- Harmonics analysis up to 40th harmonic
- Maximum values with real-time bar display

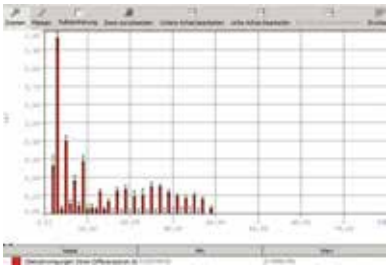


Fig.: Analysis of the harmonic fault current components

Digital IOs

- Extensive configuration of IOs for intelligent integration, alarm and control tasks

Ethernet (TCP/IP)- / Homepage- / Ethernet-Modbus gateway functionality

- Simple integration into the network
- More rapid and reliable data transfer
- Modern homepage
- World-wide access to measured values by means of standard web browsers via the device's inbuilt homepage
- Access to measurement data via various channels
- Reliable saving of measurement data possible over a very long periods of time in the 256 MByte measurement data memory
- Connection of Modbus slave devices via Ethernet-Modbus gateway

Fig.: Ethernet-Modbus gateway functionality

Measuring device homepage

- Webserver on the measuring device, i.e. device's own homepage
- Remote operation of the device display via the homepage
- Comprehensive measurement data incl. PQ
- Online data directly available via the homepage, historic data optional via the APP measured value monitor, 51.00.246

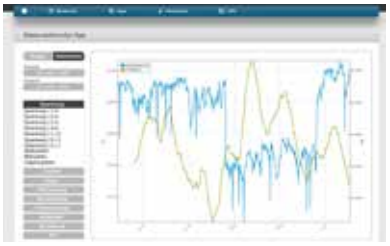


Fig.: Illustration of the online data via the device's inbuilt homepage

Typical connection variant

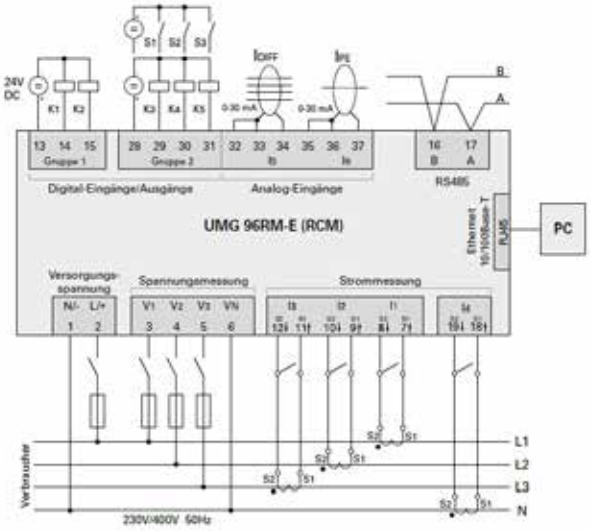


Fig.: Connection example with temperature and residual current measurement

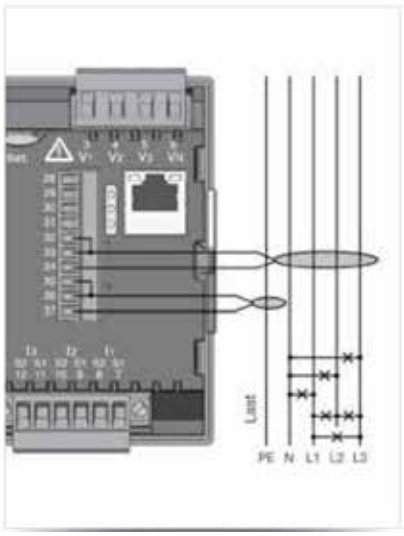
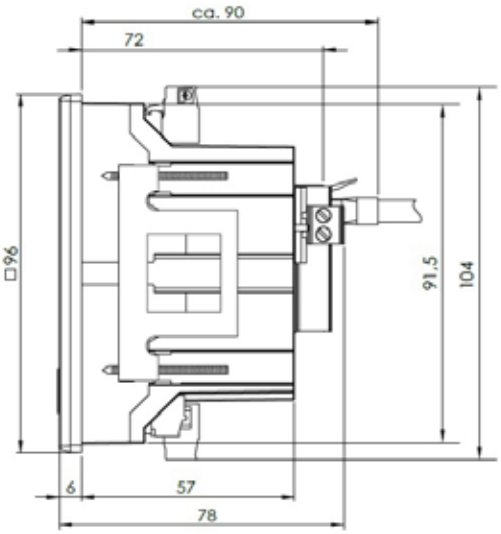
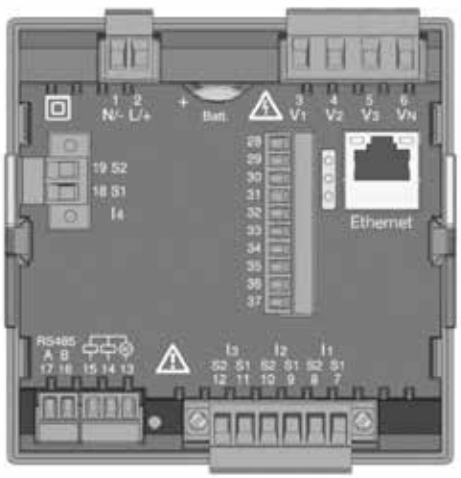


Fig.: Connection example residual current measurement and PE monitoring

Dimensions



Side view
Cut-out $92^{+0,8}$ mm x $92^{+0,8}$ mm



Rear view

General data

General	Service life of backlight	40000 h (50% of the initial brightness)
	Net weight (with attached connectors)	approx. 370 g (0.82 lb)
	Package weight (incl. accessories)	approx. 950 g (2.09 lb)
	Battery	Type Lithium CR2032, 3V (approvail in acc. with UL 1642)
Transport and storage	Free fall	1 m
	Temperature	K55 (-25° C to +70° C) (-13° F to 158° F)
	Relative humidity	0 to 90% RH
Ambient conditions during operation	Protection class	II acc. to IEC 60536 (VDE 0106, part 1)
	Rated temperature range	K55 (-10° C to +55° C) (14° F to 131° F)
	Relative humidity	0 to 75% RH
	Operating altitude	0 to 2000 m above sea level
	Pollution degree	2
	Installation position	upright
	upright	forced ventilation is not required
	Protection against ingress of solid foreign bodies and water	acc. to EN 60529
	- Front / - Rear / - Front with seal	IP40 / IP 20 / IP 54

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Technical data

Supply voltage	***Option 230 V***	
	Nominal range	90 V - 277 V (50/60 Hz) or DC 90 V - 250 V, 300 V CAT III
	Power consumption	max. 4,5 VA / 2 W
	Option 24 V	
	Nominal range	24 V - 90 V AC/DC, 300 V CAT III
	Power consumption	max. 7,5 VA / 5 W
	Operating range	+/- 10% of nominal range
	Internal fuse (not replaceable)	Type T1A / 250 VDC / 227 VAC acc. to IEC 60127
	Recommended overcurrent protection device for line protection (certified under UL)	Option 230 V: 6-16 A Option 24 V: 1 - 6 A (Char. B)

Recommendation for the maximum number of devices on a miniature circuit breaker:
230 V option: Miniature circuit breaker B6A: max. 4 devices /miniature circuit breaker B16A: max. 11 devices
24 V option: Miniature circuit breaker B6A: max. 3 devices /miniature circuit breaker B16A: max. 9 devices

Voltage measurement	3-phase 4-wire systems with rated voltages up to	277/480 V (+/- 10%)
	3-phase 3-wire systems, unearthed, with rated voltages up to	IT 480 V (+/1 10%)
	Overvoltage category	300 V CAT III
	Measurement voltage surge	4 kV
	Metering range L-N	0[1] - 300 Vrms (max. overvoltage 520 Vrms)
	Metering range L-L	0[1] - 520 Vrms (max. overvoltage 900 Vrms)
	Resolution	0,01 V
	Crest factor	2,45 (realted to the measurement range)
	Impedance	3 MΩ / phase
	Power consumption	ca. 0,1 VA
	Sampling rate	21,33 kHz (50 Hz), 25,6 kHz (60 Hz) for each measurem. channel
	Frequency of the fundamental oscillation	45 Hz ... 65 Hz, resolution 0,01 Hz

[1] The UMG 96RM-E can only determine measured values if a voltage L1-N greater than 20 Veff (4-wire measurement) or a voltage L1-L2 greater than 34 Veff (3-wire measurement) is applied at the voltage measurement input V1.

Current measurement I1-I4	Rated current	5 A
	Metering range	0 - 6 A rms
	Crest factor	1,98
	Resolution	0,1 mA (display 0,01 A)
	Overvoltage category	300 V CAT II
	Measurement voltage surge	2 KV
	Power consumption	approx. 0,2 VA (Ri = 5 m Ω)
	Overload for 1 sec.	120 A (sinusoidal))
	Sampling rate	20 kHz

Residual current monitoring I5 / I6	Rated current	5 A
	Metering range	0 - 40 mA rms
	Triggering current	50 µA
	Resolution	1 µA
	Crest factor	1,414 (related to 40 mA)
	Burden	4 Ohm
	Overload for 1 sec.	5 A
	Sustained overload	1 A
	Overload for 20 ms	50 A
	Residual current monitoring	as per IEC/TR 60755 (2008-01), type A and type B

Digital outputs	2 and 3 optional additional digital outputs	semiconductor relay, not short-circuit proof
	Switching voltage	max. 33 V AC, 60 V DC
	Switching current	max. 50 mAeff AC/DC
	Response time	10/12 periods + 10 ms *
	Pulse output (energy pulses)	max. 50 Hz

* Response time, e.g. at 50 Hz: 200 ms + 10 ms = 210 ms

Digital inputs	3 optional additional digital outputs	semiconductor relay, not short-circuit proof
	Maximum counter frequency	20 Hz
	Input signal present	18 V to 28 V DC (typical 4 mA)
	Input signal not present	0 to 5 V DC, current less than0,5 mA

Temperature measurement	2 optional inputs			
	Update time		1 second	
	Connectable sensors		Pt100, Pt1000, KTY83, KTY 84	
	Total burden (sensor + cable)		max. 4 kOhm	
	Sensor type	Temperature range	Resistor range	Measurem. uncertainty
	KTY83	-55° C ... +175° C (-67° F .. to 347° F)	500 Ohm ... 2,6 kOhm	+/- 1,5% rng
	KTY84	-40° C ... +300° C (-40° F .. to 572° F)	350 Ohm ... 2,6 kOhm	+/- 1,5% rng
	Pt100	-99° C ... +500° C (-146,2° F .. to 932° F)	60 Ohm ... 180 Ohm	+/- 1,5% rng
	Pt1000	-99° C ... +500° C (-146,2° F .. to 932° F)	600 Ohm ... 1,8 kOhm	+/- 1,5% rng

Serial interface	RS485 to Modbus RTU/Slave	9,6 kbps, 19,2 kbps, 38,4 kbps, 57,6 kbps, 115,2 kbps
	Stripping length	7 mm

Cable length (digital IOs)	Up to 30 m	not shielded
	Longer than 30 m	shielded

Ethernet connection	Connection	RJ45
	Functions	Modbus, Gateway, Embedded Webserver (HTTP)
	Protocols	TCP/IP, DHCP-Client (BootP), Modbus/TCP (Port 502), ICMP (Ping), NTP, Modbus RTU over Ethernet (Post 8000) FTP, SNMP

Terminal connection capacity	Supply voltage	Connectable conductors (only one conductor can be connected per terminal!)
	Single core, multi-core, fine-stranded	0,2 - 4,0 mm², AWG 26-12
	Terminal pins, core end sheath	0,2 - 2,5 mm²
	Tightening torque	0,4 - 0,5 Nm (3.54 - 4.43 lbf in)
	Stripping length	7 mm (0.2756 in)

Terminal connection capacity	Voltage measurement	Connectable conductors (only one conductor can be connected per terminal!)
	Single core, multi-core, fine-stranded	0,08 - 4,0 mm², AWG 28-12
	Terminal pins, core end sheath	0,2 - 2,5 mm²
	Tightening torque	0,4 - 0,5 Nm (3.54 - 4.43 lbf in)
	Stripping length	7 mm (0.2756 in)

Terminal connection capacity	Current measurement	Connectable conductors (only one conductor can be connected per terminal!)
	Single core, multi-core, fine-stranded	0,2 - 2,5 mm², AWG 26-12
	Terminal pins, core end sheath	0,2 - 2,5 mm²
	Tightening torque	0,4 - 0,5 Nm (3.54 - 4.43 lbf in)
	Stripping length	7 mm (0.2756 in)

Terminal connection capacity	Residual current and temperature measurement inputs and digital IOs	Connectable conductors
	Rigid/flexible	0,14 - 1,5 mm², AWG 28-16
	Flexible with core end sheath without plastic sleeve	0,20 - 1,5 mm²
	Flexible with core end sheath with plastic sleeve	0,20 - 1,5 mm²
	Tightening torque	0,20 - 0,25 Nm (1.77 - 2,21 lbf in)

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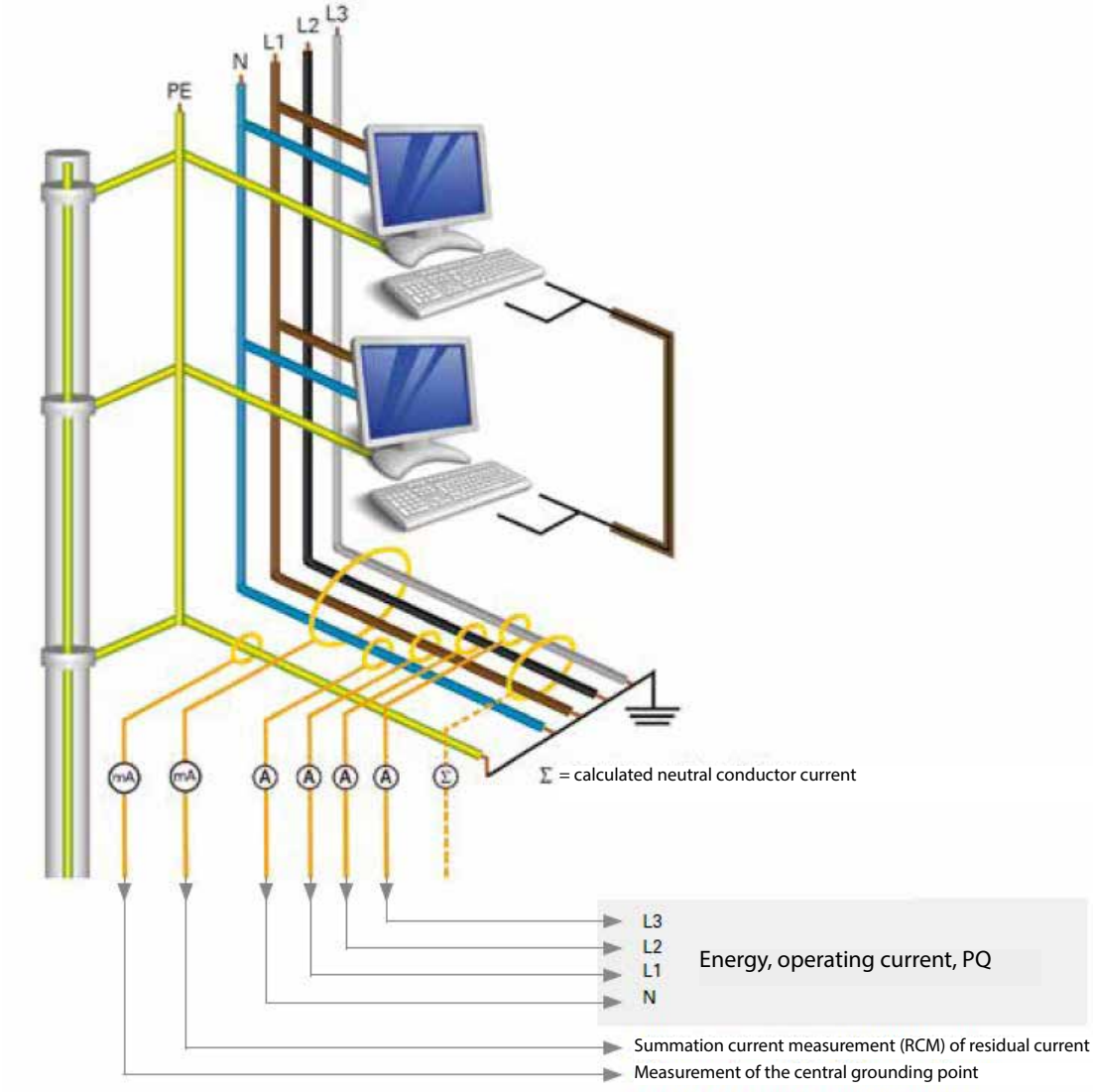
Terminal connection capacity	Serial interface	Connectable conductors
	Single core, multi-core, fine-stranded	0,2 - 1,5 mm², AWG 28-16
	Terminal pins, core end sheath	0,2 - 1,5 mm²
	Tightening torque	0,2 - 0,25 Nm (1.77 - 2,21 lbf in)
	Stripping length	7 mm (0.2756 in)

Firmware	Firmware Update	Update via GridVis® Power Grid monitoring software Firmware download (free of charge)

Schematic measurement setup



Prices

Type	UMG 96RM-E
Version UH 230 V	52.22.062
Price	***on request***
Version UH 24 V	52.22.063
Price	***on request***

BACnet communication
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