UMG 96RM
Multifunction power analyser

Communication (device-specific)
- Modbus (RTU)
- Profinet
- TCP/IP
- M-Bus

Interfaces
- RS485 (UMG 96RM, UMG 96RM-P, UMG 96RM-CBM)
- Profinet (UMG 96RM-P)
- M-Bus (UMG 96RM-M)
- Ethernet (UMG 96RM-EL)
- USB (UMG 96RM-P, UMG 96RM-CBM)

Power quality
- Harmonics up to 40th harmonic
- Rotary field components
- Distortion factor THD-U / THD-I
- Waveform display (UMG 96RM-EL) via GridVis®-Basic software

Up to 4 digital inputs
- Pulse input
- Logic input
- State monitoring

Up to 6 digital outputs
- Pulse output kWh / kvarh
- Switch output
- Threshold value output
- Logic output
- Remote via Modbus / Profinet

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

Measured data memory
(UMG 96RM-CBM, UMG 96RM-P)
(UMG 96RM, UMG 96RM-M und UMG 96RM-EL
without measurement data memory, energy, minimum and maximum values will be saved in the EEPROM)
- 256 MB Flash

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

Network visualisation software
- Free GridVis®-Basic

Network visualisation software
Free GridVis®-Basic
Areas of application

- Measurement, monitoring and checking of electrical characteristics in energy distribution systems
- Recording of load profiles for energy management systems (e.g. ISO 50001)
- Acquisition of the energy consumption for cost centre analysis
- Measured value transducer for building management systems or PLC (Modbus)

Main features

Particular advantages

- Compact construction saves space and costs during installation
- Seamless and sustained recording thanks to large measured data memory or via the online data acquisition (e.g. GridVis®-Service)
- High data security and redundancy
- Comprehensive communications options and protocols
- Multifaceted, pre-defined reports for power quality and energy consumption analysis (via GridVis®-Service)
- Simple report generation at the press of a button or automatically in accordance with defined time plans
- Precision measurement results provide an effective infrastructure as well as high production availability
- Generic Modbus profile: Arbitrary Modbus-capable devices and systems from other manufacturers can be incorporated and visualised in the monitoring solutions
- Long-term availability of the measurement devices guarantees simple retrofitting with system expansions

Energy data acquisition & load profile

- Detailed acquisition of the energy data and the load profile
- More transparency in energy supply through energy analyses
- Safer design of the power distribution systems

Fig.: Load profiles are the basis for energy management
Cost centre analysis

- Determination of energy costs
- Breakdown and allocation of energy consumers

Energy management systems (ISO 50001)

- Continuous increase in energy efficiency
- Cost reduction
- UMG 96RM series multifunctional power analysers are an important part of energy management systems

Transparency of energy supply

- More transparency through a multi-stage, scalable measurement system
- Acquisition of individual events through continuous measurement with high resolution

Power quality monitoring

- Notification of inadequate power quality
- Introduction of measures to address network problems
- Prevention of production downtimes
- Significantly longer service life for equipment
- Improved sustainability

Measurement accuracy of 0.2 % (V), kWh class = 0.5S

- High sampling rate at 21.3 kHz
- Reliable measurement accuracy of 0.2 % (V)
- Effective energy class (kWh): 0.5S

Energy meter with 8 tariffs, effective and reactive energy

- Energy measurement in 4 quadrants, each with 8 tariffs for effective and reactive energy
- Safe and precise acquisition of operational values for individual electrical loads

Communications options:

- Ethernet, Profibus, Modbus, M-Bus, ...

- Numerous interfaces and protocols, guaranteeing an easy system connection (energy management system, PLC, SCADA, BMS)
**Large measurement data memory**
- Saving of measurement data possible over very long periods of time
- Recording freely user configurable

**Harmonics analyser**
- Harmonics analysis up to 40th harmonic
- Information about power quality, grid disturbances and possible “network polluters”

**Pluggable screw terminals**
- Convenient installation even where spaces are tight

**Backlight**
- Large, high-contrast LCD display with backlighting
- Very good readability and intuitive operation, even in poor lighting conditions

**Basic device**
- RS485 interface with Modbus protocol and 2 digital outputs enable quick and low-cost monitoring of power quality and energy consumption

**Profibus and digital IOs**
- The Profibus connection is used in systems where the UMG 96RM-P is to be incorporated into the automation environment (PLC controllers)

**M-Bus**
- The UMG 96RM-M can be simply and cost-effectively integrated into consumption data acquisition systems via the M-Bus connection.
- The M-Bus is primarily used for the acquisition of consumption data collection from various different consumption meters, such as water, gas, heat or electrical current.
Ethernet (TCP/IP) with the UMG 96RM-EL

- Simple integration into the Ethernet (LAN) network
- Fast and reliable data communication

4th current transformer input

- Continuous monitoring of the N-conductor by means of the 4th current input
- Available with variants UMG 96RM-P and UMG 96RM-CBM

Dimension diagrams

All dimensions in mm

The illustrations shown here are examples. Further dimensional drawings and connection diagrams are available on request or can be viewed on our homepage.
Typical connection

The illustration shown here is an example. Further connection diagrams are available on request or can be viewed on our homepage.

Fig.: Battery insertion on the rear (UMG 96RM-CBM and UMG 96RM-P)

Fig.: UMG 96RM-PN with Profinet interface
Device overview and technical data

<table>
<thead>
<tr>
<th>Item no. (90–277 V AC/90–250 V DC)</th>
<th>UMG 96RM*1</th>
<th>UMG 96RM-M*1</th>
<th>UMG 96RM-EL*1</th>
<th>UMG 96RM-CBM*1</th>
<th>UMG 96RM-P*1</th>
<th>UMG 96RM-PN*1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item no. (24–90 V AC/24–90 V DC)</td>
<td>52.22.070</td>
<td>52.22.073</td>
<td>52.22.072</td>
<td>52.22.067</td>
<td>52.22.065</td>
<td>52.22.091</td>
</tr>
<tr>
<td>Interfaces</td>
<td>RS485</td>
<td>M-Bus</td>
<td>Ethernet</td>
<td>RS485, USB</td>
<td>RS485, Profibus, USB</td>
<td>RS485, Ethernet, Profinet</td>
</tr>
</tbody>
</table>

| Protocols                        | Modbus RTU| -            | -            | -              | -            | -            |
|                                  | Modbus TCP| -            | -            | -              | -            | -            |
|                                  | Profibus DP V0 | - | - | - | - | - |
|                                  | Profinet   | -            | -            | -              | -            | -            |
|                                  | M-Bus      | -            | -            | -              | -            | -            |
|                                  | DHCP or DCP| -            | -            | -              | -            | -            |
|                                  | ICMP (Ping)| -            | -            | -              | -            | -            |

| Measurement data recording       | Current measurement channels | 3 | 3 | 3 | 4 | 4 | 4 (+2) |
|                                  | Memory (Flash) | - | - | - | 256 MB | 256 MB | - |
|                                  | Battery | - | - | - | Type CR2032 | 3 V, Li-Mn | Type CR2032 | 3 V, Li-Mn | - |
|                                  | Clock | - | - | - | - | - | - |

| Digital inputs and outputs       | Digital inputs | - | - | - | 4 | 4 | 3*3 |
|                                  | Digital outputs (as switch or pulse output) | 2 | 2 | - | 6 | 6 | 2 (+3)*3 |

| Mechanical properties            | Device dimensions in mm (W xH x D) | 96 x 96 x approx. 48 | 96 x 96 x approx. 48 | 96 x 96 x approx. 48 | 96 x 96 x approx. 78 | 96 x 96 x approx. 78 | 96 x 96 x approx. 78 |

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

• = included   - = not included
*1 UL certification included.
*2 Accurate device dimensions can be found in the operation manual.
*3 Optional 3 digital inputs or outputs (no pulse output)

General
Service life of backlight 40000 h (50% of the initial brightness)

Transport and storage
The following information applies to devices which are transported or stored in the original packaging.
Free fall 1 m
Temperature K55 (-25°C to +70°C)
Relative humidity 0 to 90% RH

Ambient conditions during operation
The UMG 96RM is intended for weather-protected, stationary use.
Protection class II in acc. with IEC 60536 (VDE 0106, Part 1).
Rated temperature range K55 (~10°C to +55°C)
Relative humidity 0 to 75% RH
Operating altitude 0 to 2000 m above sea level
Pollution degree 2
Installation position any
Ventilation forced ventilation is not required.

Protection against ingress of solid foreign bodies and water
- Front IP40 in acc. with EN60529
- Rear IP20 in acc. with EN60529
- Front with seal IP54 in acc. with EN60529

Janitza®
## Supply voltage

<table>
<thead>
<tr>
<th>Option</th>
<th>Nominal range</th>
<th>Power consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>230 V option</td>
<td>90 V - 277 V (50/60 Hz) or DC 90 V - 250 V; 300 V CAT III</td>
<td>max. 4.5 VA / 2 W (RM-M) max. 5.5 VA / 3 W (RM) max. 5 VA / 2 W (RM-EL) max. 6 VA / 3 W (RM-CBM) max. 7.5 VA / 4 W (RM-P) max. 8.5 VA / 5 W (RM-PN)</td>
</tr>
<tr>
<td>24 V option</td>
<td>24 V - 90 V AC / DC; 150 V CAT III</td>
<td>max. 2.5 VA / 2 W (RM-M) max. 3.5 VA / 2 W (RM-EL) max. 4.5 VA / 3 W (RM) max. 5 VA / 3 W (RM-CBM) max. 6.5 VA / 5 W (RM-P) max. 7 VA / 5 W (RM-PN)</td>
</tr>
</tbody>
</table>

**Operating range:** ±10% of nominal range

**Internal fuse:** Type T1A / 250 V/277 V according to IEC 60127

**Recommended overcurrent protection device for line protection (certified under UL):**

- 230 V option: 6 - 16 A
- 24 V option: 1 - 6 A

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## 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 mm², AWG 26 - 12
- Terminal pins, core end sheath: 0.2 - 2.5 mm²
- Tightening torque: 0.4 - 0.5 Nm
- Stripping length: 7 mm

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## Voltage measurement

- **Three-phase 4-conductor systems with rated voltages up to 277 V/480 V (±10%):**
- **Three-phase 3-conductor systems, unearthed, with rated voltages up to IT 480 V (±10%):**
- **Overvoltage category:** 300 V CAT III
- **Measurement voltage surge:** 4 kV
- **Metering range L-N:**
  - 0 V to 300 V<sub>min</sub> (max. overvoltage 520 V<sub>max</sub>)
- **Metering range L-L:**
  - 0 V to 520 V<sub>min</sub> (max. overvoltage 900 V<sub>max</sub>)
- **Resolution:** 0.01 V
- **Crest factor:** 2.45 (related to the measurement range)
- **Impedance:** 3 MΩ-phase
- **Power consumption:** approx. 0.1 VA
- **Sampling rate:** 21.33 kHz (50 Hz), 25.6 kHz (60 Hz) for each measurement channel
- **Frequency of the fundamental oscillation:**
  - Resolution: 46 Hz to 65 Hz
  - 0.01 Hz

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## Current measurement

- **Rated current:** 5 A
- **Metering range:** 0 to 6 A<sub>max</sub>
- **Crest factor:** 1.96
- **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 (R<sub>i</sub> = 5 mΩ/m)
- **Overload for 1 sec.:** 120 A (sinusoidal)
- **Sampling rate:** 21.33 kHz (50 Hz), 25.6 kHz (60 Hz) for each measurement channel

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*The UMG 96RM can only determine measured values if a voltage L1-N greater than 20 V<sub>eff</sub> (4-wire measurement) or a voltage L1-L2 greater than 34 V<sub>eff</sub> (3-wire measurement) is applied at the voltage measurement input V1.*