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Deutsche Version: siehe Vorderseite

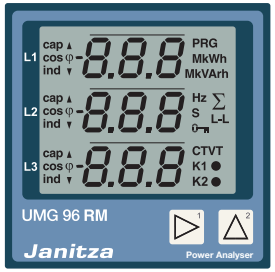
Power Analyser

UMG 96 RM-PN

Installation manual

Residual current monitoring (RCM)

- Installation
- Device settings



User manual:

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Janitza®

1 General

Disclaimer
The observance of the information products for the devices is a prerequisite for safe operation and to achieve the stipulated performance characteristics and product characteristics. Janitza electronics GmbH accepts no liability for injuries to personnel, property damage or financial losses arising due to a failure to comply with the information products. Ensure that your information products are accessible and legible.

Further information can be found on our website www.janitza.com at Support > Downloads.

Copyright notice

Subject to technical amendments
- Make sure that your device agrees with the installation manual.
- Read and understand first product-related documents.
- Keep product supporting documentation throughout the life available and, where appropriate, to pass on to subsequent users.
- Please inform yourself about device revisions and the associated adjustments to the product-related documentation on www.janitza.com.

Disposal
Please observe national regulations!
If disposing of individual parts, please dispose of them in accordance with their nature and existing country-specific regulations, for example as:
- Electrical scrap
- Plastics
- Metals

Or, task a certified disposal business with the scrapping.

Relevant laws, applied standards and directives
The laws, standards and directives for the device applied by Janitza electronic GmbH can be found in the declaration of conformity on our website.

2 Safety

Safety information
The "Installation manual" is not a complete directory of all safety measures required to operate the device.
Special operating conditions may require further measures. The "Installation manual" contains instructions that must be observed to ensure your personal safety and to prevent damage to property.

Symbols used:

	This symbol is an addition to the safety instructions and indicates an electrical hazard.
	This symbol is an addition to the safety instructions and indicates a potential hazard.
	This symbol with the word **NOTE!** describes: • Procedures that do not pose any risks of injures. • Important information, procedures or handling steps.

Safety information is highlighted by a warning triangle and is indicated as follows depending on the degree of danger:

 **DANGER!**	Indicates an imminent danger that causes severe or fatal injuries.
 **WARNING!**	Indicates a potentially hazardous situation that can cause severe injuries or death.
 **CAUTION!**	Indicates a potentially hazardous situation that can cause minor injuries or damage to property.

Safety measures
When operating electrical devices, certain parts of these devices are invariably subjected to hazardous voltage. Therefore, severe bodily injuries or damage to property can occur if they are not handled properly:
- Before connecting connections, earth the device at the ground wire connection if present.
- Hazardous voltages may be present in all switching parts that are connected to the power supply.
- Hazardous voltages may also be present in the device even after disconnecting the supply voltage (capacitor storage).
- Do not operate equipment with current transformer circuits while open.
- Do not exceed the threshold values specified in the user manual and on the rating plate. Also adhere to this when inspecting and commissioning.
- Observe the safety and warning instructions in the documents that belong to the device!

To protect your IT system, network, data communications and measurement devices:
- Notify your network administrator and/or IT manager.
- Always keep the measurement device firmware up to date and protect the communication to the measurement device with an external firewall. Close any unused ports.
- Take protective measures against viruses and cyber attacks from the Internet, e.g. through firewall solutions, security updates and antivirus programs.
- Eliminate security vulnerabilities and update or renew existing protection for your IT infrastructure.

Qualified staff
In order to prevent personal injuries and damage to property, only qualified staff with electrical training may work on the device, with knowledge of
- the national accident prevention regulations
- the safety engineering standards
- installing, commissioning and operating the device.

Proper use
The device is
- intended for installation in switch cabinets and small installation distributors (please observe step 3 "Installation").
- not intended for installation in vehicles! The use of the device in mobile equipment is considered to be non-standard environmental conditions and is therefore only permitted after separate agreement.
- not intended for installation in environments with hazardous oils, acids, gases, vapours, dusts, radiation, etc.

The prerequisites of faultless, safe operation of this device are proper transport and proper storage, set-up, installation, operation and maintenance.

3 Device short description

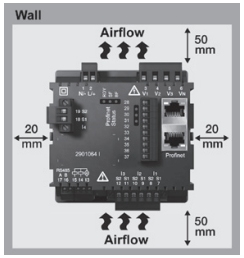
The UMG 96 RM-PN is a multi-functional network analyser, which

- measures residual currents (RCM) and currents at the central grounding point (CGP). The residual current monitoring is carried out via an external residual current transformer (30 mA rated current) on the current measurement inputs I5 and I6.
- measures and calculates electrical variables such as voltage, current, power, energy, harmonics, etc. in building installations, on distribution units, circuit breakers and busbar trunking systems.
- displays and saves measurement results and transmits them via interfaces.

NOTE!
The device
- possesses no monitoring function and does not send warning pulses!
- is designed to deliver measuring data to a PLC, which performs monitoring functions if necessary.

Assembly

Install the UMG 96 RM-PN in the weatherproof front panel of switch cabinets.



Cut-out size:
$92^{+0.8}$ x $92^{+0.8}$ mm

Ensure!
Adequate ventilation
- install the device vertically!
- adhere to clearances from neighbouring components!

Fig. Installation situation, rear view

CAUTION!
Damage to property due to disregard of the installation instructions

Failing to observe the installation instructions can damage or destroy your device.
Ensure that there is adequate air circulation in your installation environment; if the ambient temperatures are high, ensure there is adequate cooling if required.

NOTE!
For further information on device functions, data and assembly, see the user manual.

4 Connecting the supply voltage

The supply voltage level for your device is specified on the rating plate.
After connecting the supply voltage, an indication is shown on the display. If no indication appears, check whether the supply voltage is within the rated voltage range.

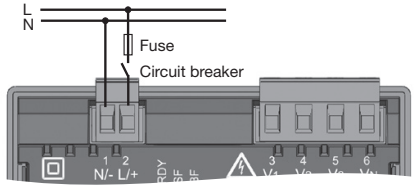


Fig. Connecting supply voltage.

WARNING!
Risk of injury due to electric voltage!

Serious bodily injury or death can result from:
- Contact with bare or stripped live wires.
- Device inputs that are dangerous to touch.

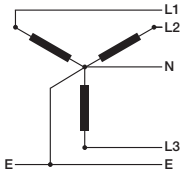
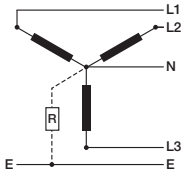
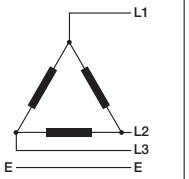
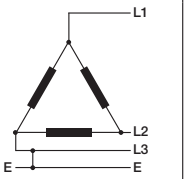
De-energise your device before starting work! Check that it is de-energised.

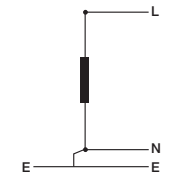
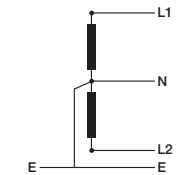
CAUTION!
Damage to property due to disregard of the connection conditions or impermissible voltage swells

Your device can be damaged or destroyed by a failure to comply with the connection conditions or by exceeding the permissible voltage range.
Before connecting the device to the supply voltage, please check:
- **Voltage and frequency correspond to the details on the ratings plate! Threshold values stipulated in the user manual have been complied with!**
- **In building installations, the supply voltage must be protected with a UL/IEC approved circuit breaker / a fuse!**
- **The circuit breaker**
  - **must be easily accessible for the user and be installed close to the device.**
  - **must be labelled for the relevant device.**
- **Do not connect the supply voltage to the voltage transformers.**
- **Provide a fuse for the neutral conductor if the source's neutral conductor connection is not earthed.**

5 Network systems

Suitable network systems and maximum rated voltages (DIN EN 61010-1/A1):

Three-phase four-conductor systems with earthed neutral conductor	Three-phase four-conductor systems with non-earthed neutral conductor (IT networks)	Three-phase, three-conductor systems Not earthed	Three-phase, three-conductor systems with earthed phase
			
U_{L-N} / U_{L-L} 277 VLN / 480 VLL	U_{L-N} / U_{L-L} 277 VLN / 480 VLL	U_{L-L} 480 VLL	U_{L-L} 240 VLL

Single-phase two-conductor systems with earthed neutral conductor	Separated single-phase, three-conductor systems with earthed neutral conductor
	
U_{L-N} 230 VLN	U_{L-N} / U_{L-L} 240 VLN / 480 VLL

The device can be used in
- 2, 3 and 4 conductor networks (TN, TT and IT networks)
- Industrial areas

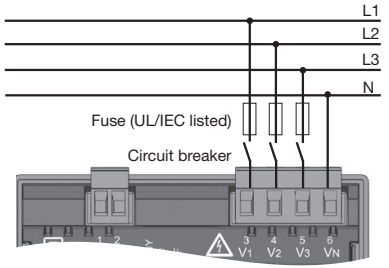
6 Voltage measurement

The UMG 96 RM-PN has 3 voltage measurement inputs and is suitable for various connection variants, with direct connection or via voltage transformer.

CAUTION!
Risk of injuries or damage to the device

Disregard of the connection conditions for the voltage measurement inputs can result in injuries or to the device being damaged.
Therefore, note the following:
- **The voltage measurement inputs**
  - **must not be occupied with DC voltage.**
  - **must be provided with a suitable, labelled fuse that is positioned close by and a circuit breaker (alternatively: a line safety switch).**
  - **are dangerous to touch.**
- **Voltages that exceed the allowed network rated voltages must be connected via a voltage transformer.**
- **Measured voltages and measured currents must derive from the same network!**

NOTE!
As an alternative to the fuse and circuit breaker, you can use a line safety switch.



Voltage measurement connection variant ***3p 4w (Addr. 509 = 0, standard setting)***

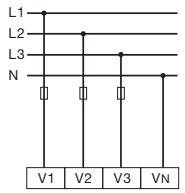
The voltage measurement inputs are designed for measurements in low voltage networks, in which rated voltages of up to
- 277 V phase to earth and 480 V phase to phase in the 4-conductor system or
- 480 V phase to phase in the 3-conductor system

occur.
The measurement and surge voltages meet overvoltage category 300 V CATIII.

NOTE!
With measurement range exceeding, the measurement device display shows "*EEE*". Further information on this can be found in the user manual.

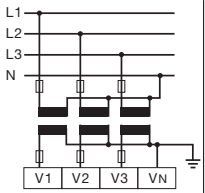
7 Voltage measurement connection variants

3p 4w
(Addr. 509 = 0, standard setting)



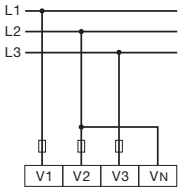
Measurement with 3 phase conductors and neutral conductor.

3p 4wu
(Addr. 509 = 1)



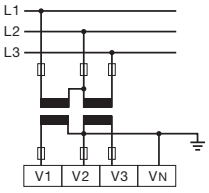
Measurement via voltage transformer with 3 phase conductors and a neutral conductor.

3p 4u
(Addr. 509 = 2)



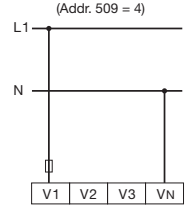
Measurement with 3 phase conductors without neutral conductor. Measured values which require an N, use a calculated N.

3p 2u
(Addr. 509 = 5)



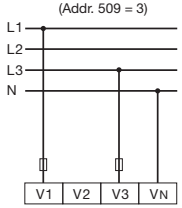
Measurement via voltage transformer with 3 phase conductors without neutral conductor. Measured values which require an N, use a calculated N.

1p 2w1
(Addr. 509 = 4)



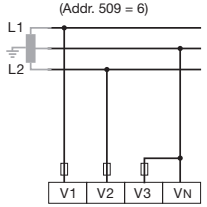
Measured values derived from voltage measurement inputs V2 and V3 are taken to be 0 and are not calculated.

2p 4w
(Addr. 509 = 3)



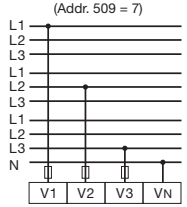
System with equal loading of the phases. The measured values of the voltage measurement input V2 are calculated.

1p 2w
(Addr. 509 = 6)



TN-C system with 1-phase, three-conductor connection. Measured values derived from voltage measurement input V3 are taken to be 0 and are not calculated.

3p 1w
(Addr. 509 = 7)



3 systems with equal loading of the phases. The measured values for the phases that are not created (L2/L3, L1/L3, L1/L2) for the relevant systems are calculated.

8 Current measurement I1, I2, I3

The UMG 96 RM-PN

- is only approved for measuring current with a current transformer.
- is intended for connecting current transformers with secondary currents of ../1 A and ../5 A.
- has the current transformer ratio 5/5 A set as standard.
- measures AC currents, does not measure DC currents!

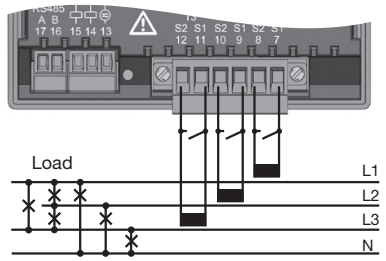
WARNING! **Risk of injury due to electric voltage!**

Serious bodily injury or death can result from:

- Contact with bare or stripped live wires.
- Current measurement inputs that are dangerous to touch on the device and on the current transformers.

De-energise your device before starting work! Check that it is de-energised.
Earth your system! Use the earth connection points with earthing symbols for this!

Connection variant **3p 4w current measurement** *(I1, I2, I3) via current transformer* ***(Addr. 510 = 0, standard setting).***



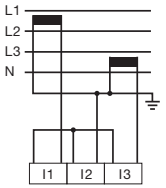
NOTE!
With measurement range exceeding, the measurement device display shows "*EEE*". Further information on this can be found in the user manual.

WARNING! **Risk of injury due to large currents and high electric voltages!**

Current transformers operating with an open secondary circuit (high voltage peaks) can result in serious or even fatal injuries.
Avoid open operation of the current transformers - short-circuit unloaded transformers!

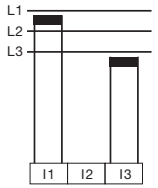
9 Connection variants for current measurement I1, I2, I3

3p 2i
(Addr. 510 = 1)



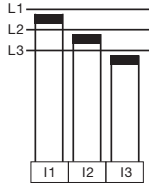
System with equal loading of the phases. The measured values for current measurement input I2 are measured.

3p 2i0
(Addr. 510 = 2)



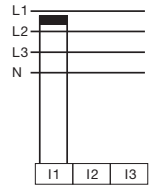
The measured values for current measurement input I2 are calculated.

3p 3w3
(Addr. 510 = 3)



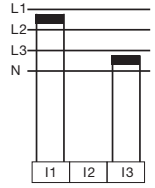
Measurement in the 3-phase network with unequal loading.

3p 3w
(Addr. 510 = 4)



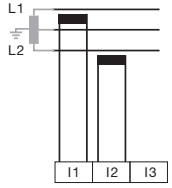
Measurement in the 3-phase network with equal loading. The measured values for current measurement inputs I2 and I3 are calculated.

2p 4w
(Addr. 510 = 5)



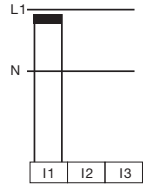
System with equal loading of the phases. The measured values for current measurement input I2 are calculated.

1p 2i
(Addr. 510 = 6)



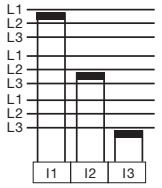
Measured values derived from current measurement input I3 are taken to be 0 and are not calculated.

1p 2w
(Addr. 510 = 7)



Measured values derived from current measurement inputs I2 and I3 are taken to be 0 and are not calculated.

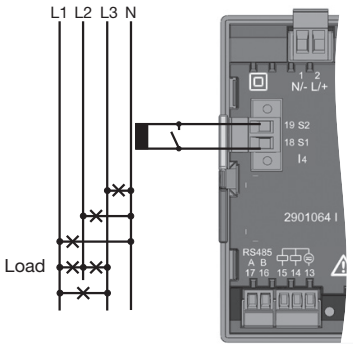
3p 1w
(Addr. 510 = 8)



3 systems with equal loading of the phases. The measured values for the phases that are not created (L2/L3, L1/L3, L1/L2) for the relevant systems are calculated.

10 Current measurement I4

Connection variant for current measurement (I4) via current transformer:



Via the current input I4:

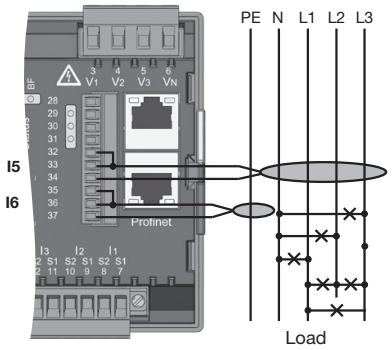
- an apparent current measurement is carried out with the voltage due to the lack of a multiplier.
- no power measurement is carried out!

NOTE!
The current measurement input I4 does not require a connection variant on the device.

NOTE!
Further information on current transformers can be found in the user manual.

11 Residual current monitoring (RCM) via I5 and I6

Connection variant of residual current monitoring via current transformer



NOTE!
The device
- possesses no monitoring function and does not send warnings itself!
- is designed to deliver measuring data to a PLC, which performs monitoring functions if necessary.

The UMG 96 RM-PN measures AC currents and pulsing direct currents.
The UMG 96 RM-PN measures residual currents in accordance with IEC/TR 60755 (2008-01), of

type A

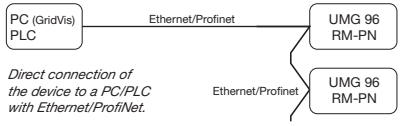
Suitable residual current transformers with a rated current of 30 mA are connected to terminals 32 to 34 (**I5**) and terminals 35 to 37 (**I6**).

NOTE!
- The transformation ratios for the residual current transformer inputs can be individually configured via the GridVis® software (included).
- A connection variant **"UMG 96 RM-PN with residual current measurement via measurement inputs I5/I6"** can be found in the user manual.
- Measurement inputs I5 and I6 do not require connection variants on the device.

12 Establish the connection to the PC

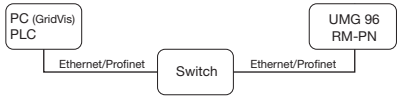
Communication connections:

1.



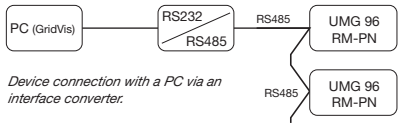
Direct connection of the device to a PC/PLC with Ethernet/ProfiNet.

2.



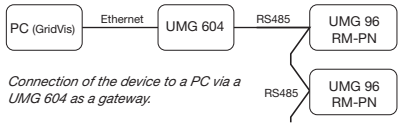
Connection of the device to a PC/PLC with Ethernet/ProfiNet via a switch (fieldbus level).

3.



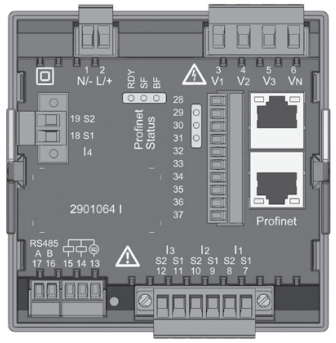
Device connection with a PC via an interface converter.

4.



Connection of the device to a PC via a UMG 604 as a gateway.

More information on device configuration and communication is provided as of step 14.



Recommendation for the Ethernet connection:
Use at least a CAT5 cable!

CAUTION! **Damage to property due to incorrect network settings**
Incorrect network settings can cause faults in the IT network!
Obtain information from your network administrator about the correct Ethernet network settings for your device(s).

13 Ethernet/ProfiNet interface

The device is equipped with **2 equivalent** Ethernet interfaces, via which further Ethernet/ProfiNet end devices can be connected for example.

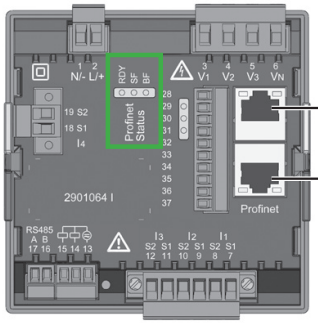


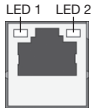
Fig.: Example connection

- PC
- Switch
- PLC

Ethernet / ProfiNet device

ProfiNet status LED bar

LED	Status	Function
RDY	Off	Device is not powered.
RDY	Flashing	Device is being initialised.
RDY	On	Device is ready for operation.
SF	On	Configuration error or system error.
BF	On	No connection.
BF	Flashing	No ProfiNet connection, physical connection available.
BF	Off	Connection to the PLC active.



LED	Colour	Function
1	Green	Lights up when connection (link) is active.
2	Yellow	Flashes with network activity.

NOTE! The device master data file (GSDML file):
Describes the ProfiNet characteristics of the UMG96RM-PN and is required by the configuration program of the PLC for example. The device master file (XML) for the UMG96RM-PN **has the file name "GSDML-V2.31-JanitzaelectronicsGmbH-UMG96RM-PN-xxxxxxxx.xml"** and can be found on a separate data carrier (included).

PROFIenergy/Entity Class 2 certification

PROFIenergy is a profile for energy management in production systems, which is based on ProfiNet.

The UMG 96 RM-PN
- is certified as *Entity Class 2* for use of the *PROFIenergy Profile V1.1*.
- provides a defined set of functions and information.

The configuration and installation effort are thereby standardised and reduced.

NOTE!
Dynamic Configuration Protocol (DCP)
This function assigns unique addresses and names to the subscribers of a ProfiNet system, and is prioritised by the UMG 96 RM-PN.

NOTE!
ProfiNet configuration
Due to the reduced installation effort in the ProfiNet system, the TCP/IP settings for the UMG 96 RM-PN are omitted (from step 17).

NOTE!
For further information on the Ethernet/Profinet interface see the user manual.

14 Operation and button functions

The device is operated with buttons 1 and 2, whereby the following distinctions are made:

- Short press (button 1 or 2):
  Next step (+1).
- Long press (button 1 or 2):
  previous step (-1).

The device differentiates between display and programming mode.

Measured values are arranged in measured value display profiles and can be adjusted easily in the GridVis® software (included). Measured value display profile 1 is configured in the factory.

Display mode

- You can use buttons 1 and 2 to scroll between the measured value indications.
- The measured value indication shows up to 3 measured values.
- A time for an automatic indication change between the measured value indications can be configured in the GridVis® software.

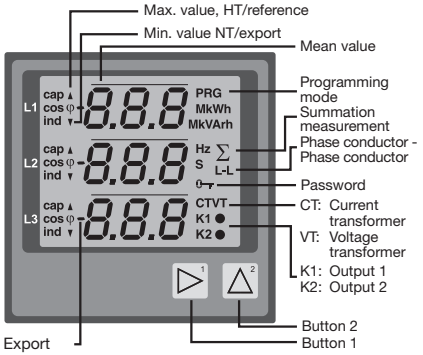


Fig. Display UMG 96 RM-PN

NOTE!
More detailed information on operation, display and button functions for your device can be found in the user manual.

15 Programming mode

- Press and hold buttons 1 and 2 simultaneously for 1 second to switch between **display mode** and **programming mode**. The text **PRG** appears in the display.
- Configure the necessary settings for the operation of the device in programming mode.
- The programming mode can be protected with a user password.
- Button 2 switches between the programming menus:
  1. Current transformer
  2. Voltage transformer
  3. Parameter list
  4. TCP/IP device address
  5. Subnet mask
  6. Gateway address

The device switches from **programming mode** to **display mode** if

- no buttons are pressed for 60 seconds.
- buttons 1 and 2 are pressed simultaneously for 1 second.

NOTE!
Changes are only applied after exiting programming mode.

NOTE!
The TCP/IP device address is configured directly on the device (see step 17).
The device is also equipped with **dynamic TCP/IP addressing (DCP) for ProfiNet systems!**

NOTE!
The following section explains the programming menus for the current transformer (1.), TCP/IP device address, subnet mask and gateway address (4., 5., 6.) via the Ethernet interface, which are most important for a installation manual.
The Dynamic Configuration Protocol (DCP) distributes the addresses and names within ProfiNet systems!
The UMG 96 RM-PN prioritises DCP.

In order to make the following settings, sample settings for the device and the PC are selected:
Device IP address: 192.168.1.116
Subnet mask: 255.255.255.0
PC IP address: 192.168.1.117
Subnet mask: 255.255.255.0

16 Programming the current transformer

1. Switch to programming mode.
2. The symbols for programming mode **PRG** and for the current transformer **CT** appear.
3. Press button 1 - the first digit of the input field for the primary current flashes.
4. Use button 2 to select the value for the 1st digit.
5. Use button 1 to move to the 2nd. digit.
6. Use button 2 to select the value of the 2nd digit.
7. Use button 1 to move to the 3rd digit.
8. Use button 2 to select the value of the 3rd digit.
9. Confirm with button 1.
10. The complete number flashes.
11. Use button 2 to select the decimal place and thus the unit of the primary current.
12. Confirm with button 1.
13. The input range of the secondary current flashes.
14. Use button 2 to set the secondary current (value 1 A or 5 A).
15. Confirm with button 1.
16. Pressing buttons 1 and 2 simultaneously (1. sec.) exits the programming mode.
    Use button 2 to change to the input field for the voltage transformer.

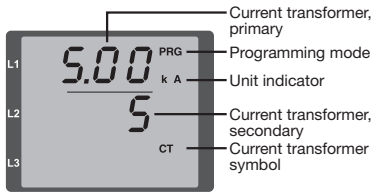


Fig. "Current transformer" input area

NOTE!
- Changes are only applied after exiting programming mode.
- For further information on current transformers and current transformer ratios, see the user manual.

NOTE!
Programming voltage transformers:
- Change to programming mode for the voltage transformer.
- The symbols **PRG** and **VT** appear in the display.
- The procedure for the **voltage transformer programming** is analogous to that of the current transformer.

Further information on voltage transformers and voltage transformer ratios can be found in the user manual.

17 Manual TCP/IP configuration via the Ethernet interface

NOTE!
The following steps are omitted with configuration of the device in a ProfiNet system (with DCP).

Each device within an Ethernet network has a unique TCP/IP address. The TCP/IP address is assigned **manually** on the device.
The 4-byte-long device address (Byte 0 to 3) is appended within the TCP/IP configuration with the subnet mask and gateway details.
Manual configuration (example) of the TCP/IP device address (Addr):

1. Switch to programming mode.
2. The symbols for programming mode **PRG** and for the current transformer **CT** appear.
3. Pressing button 2 3 times takes you to the TCP/IP settings.
   (Press the subnet mask **4x** and the gateway **5x**)
4. Use button 1 to select the 1st digit of byte 0 (selection flashes).
5. Use button 2 to select the value.
6. Use button 1 to move to the 2nd. digit / 3rd. digit.
7. Use button 2 to select the corresponding value.
8. Use button 1 to move to byte 1.
9. Select bytes 1 to 3 in the same way.
10. Configure the subnet mask (display **SUb)** and gateway address (display **GAt**) in the same way.

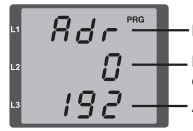


Fig. TCP/IP address, Byte 1, value 168.

A TCP/IP address consists of 4 bytes with the following structure (example):

Byte 0	Byte 1	Byte 2	Byte 3
XXX.	XXX.	XXX.	XXX

192,168,001,116

Fig. TCP/IP address, Byte 2, value 001.

Fig. TCP/IP address, Byte 3, value 116.

Technical data

General information	
Net weight (with attached connectors)	approx. 380 g
Packaging weight (including accessories)	approx. 780 g
Battery	Lithium battery CR2032, 3 V (approval i.a.w. UL 1642)
Service life of background lighting	40000 h (after this period of time the background lighting efficiency will reduce by approx. 50%)

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 coditions during operation	
The UMG 96RM is intended for weather-protected, stationary use. Protection class II i.a.w. IEC 60536 (VDE 0106, Part 1).	
Operating temperature range	K55 (-10° C .. +55° C)
Relative humidity	0 to 75% RH
Operating altitude	0 .. 2000 m above sea level
Degree of pollution	2
Mounting position	vertical
Ventilation	Forced ventilation is not required.
Protection against ingress of solid foreign bodies and water - Front side - Rear side - Front with seal	 IP40 i.a.w. EN60529 IP20 i.a.w. EN60529 IP54 i.a.w. EN60529

Supply voltage	
Nominal range	**Option 230 V**: AC 90 V - 277 V (50/60 Hz) or DC 90 V - 250 V, 300 V CATIII
	Option 24 V: AC 24 V - 90 V (50/60 Hz) or DC 24 V - 90 V, 150 V CATIII
Operating range	+-10% of the nominal range
Power consumption	**Option 230 V**: max. 8,5 VA / 5 W **Option 24 V**: max. 7 VA / 5 W
Internal fuse, not replaceable	Type T1A / 250 VDC / 277 VAC according to IEC 60127
Recommended over-current protection device for the line protection	**Option 230 V**: 6-16 A **Option 24 V**: 1-6 A (Char. B) (IEC/UL approval)

Voltage measurement	
3-phase 4-conductor systems with rated voltages of up to	277 V/480 V (+-10%)
3-phase 3-conductor systems, not earthed, with rated voltages of up to	IT 480 V (+-10%)
Overvoltage category	300 V CAT III
Rated surge voltage	4 kV
Protection of voltage measurement	1 - 10 A (with IEC-/UL approval)
Metering range L-N	0[1)] to 300 Vrms (max. overvoltage 520 Vrms)
Metering range L-L	0[1)] to 520 Vrms (max. overvoltage 900 Vrms)
Resolution	0.01 V
Crest factor	2.45 (based on metering range)
Impedance	4 MOhm / phase
Power consumption	approx. 0.1 VA
Sampling rate	21.33 kHz (50 Hz), 25.6 kHz (60 Hz) for each measurement channel
Frequency range of the fundamental oscillation - resolution	45 Hz to 65 Hz 0.01 Hz

1) ... The device determines measured values only if the Voltage measurement input V1 voltage L1-N greater than 20 Vrms (4-wire measurement) or a voltage L1-L2 of larger 34 Vrms (3-wire measurement) is applied.

Current measurement I1 - I4	
Nominal current	5 A
Metering range	0 to 6 Arms
Crest factor	1.98
Resolution	0.1 mA (display 0.01 A)
Overvoltage category	300 V CAT II
Rated surge voltage	2 kV
Power consumption	approx. 0.2 VA (Ri = 5 mΩ)
Overload for 1 sec.	120 A (sinusoidal)
Sampling rate	21.33 kHz (50 Hz), 25.6 kHz (60 Hz) for each measurement channel

Residual current monitoring I5 / I6	
Nominal current	30 mArms
Metering range	0 to 40 mArms
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

Digital outputs 2 and 3 optional digital outputs, semiconductor relays, 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 pulse)	max. 50 Hz

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

Digital inputs 3 optional digital inputs, semiconductor relays, not short-circuit proof.	
Maximum counter frequency	20 Hz
Input signal present	18V .. 28 V DC (typical 4 mA)
Input signal not present	0 .. 5 V DC, current less than 0.5 mA

Temperature measurement input 2 optional inputs.	
Update time	1 second
Connectable sensors	PT100, PT1000, KTY83, KTY84
Total burden (sensor + cable)	max. 4 kOhm

Serial interface	
RS485 - Modbus RTU/Slave	9.6 kbps, 19.2 kbps, 38.4 kbps, 57.6 kbps, 115.2 kbps
Stripping length	7 mm

Ethernet connection	
Connection	RJ45
Conformance Class	B - Switch class (IRT)
ProfiNet-Version	2.2
ProfiNet-Profile	PROFIenergy V1.1, Entity Class 2

Cable length (digital inputs and outputs, temperature measurement input)	
Up to 30 m	Unshielded
More than 30 m	Shielded

Terminal connection capacity (power supply voltage) Conductors to be connected. 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

Terminal connection capacity (residual current or temperature measurement inputs and digital inputs / outputs)	
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
Stripping length	7 mm

Terminal connection capacity (serial interface)	
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
Stripping length	7 mm

Terminal connection capacity (current measurement) Conductors to be connected. 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

Terminal connection capacity (voltage measurement) Conductors to be connected. 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
Stripping length	7 mm

NOTE!
Further technical data can be found in the user manual for the device.

19

Procedure in the event of faults

Possible fault	Cause	Remedy
No display	External fusing for the power supply voltage has tripped.	Replace fuse.
No current display	Measurement voltage is not connected.	Connect the measuring-circuit voltage.
	Measurement current is not connected.	Connect measuring-circuit current.
Current displayed is too large or too small.	Current measurement in the wrong phase.	Check connection and correct if necessary.
	Current transformer factor is incorrectly programmed.	Read out and program the current transformer transformation ratio at the current transformer.
	The current peak value at the measurement input was exceeded by harmonic components.	Install current transformer with a larger transformation ratio.
	The current at the measurement input fell short of.	Install current transformer with a suitable transformation ratio.
Voltage displayed is too large or too small.	Measurement in the wrong phase.	Check connection and correct if necessary.
	Voltage transformer incorrectly programmed.	Read out and program the voltage transformer transformation ratio at the voltage transformer.
Voltage displayed is too small.	Overrange.	Install voltage transformers.
	The peak voltage value at the measurement input has been exceeded by harmonic components.	**Caution!** Ensure the measurement inputs are not overloaded.
"EEE" in the display	See „error messages“ in the user manual.	
Device still does not work despite the above measures.	Device defective.	Send the device to the manufacturer for inspection and testing along with an accurate fault description.

Janitza®