Power Analyser

UMG 806

Installation instructions

(from firmware version 2.0.26)

Deutsche Version siehe Vorderseite

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- Installation
- Device settings



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1 General

Disclaimer
Observing the usage information for the devices is a prerequisite for safe operation and for achieving the specified performance characteristics and product features. Janitza electronics GmbH assumes no liability for personal injuries, property damage and financial losses resulting from the failure to observe the usage information. Make sure that your information products are legible and accessible.

Further usage information, such as e.g. the user manual, can be found on our web site
www.janitza.com under Support > Downloads.

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Subject to technical changes.
- Make sure that the installation instructions match your device.
- Make sure you have first read and understood the usage information accompanying the product.
- Keep the usage information accompanying the product accessible through its service life and hand it over to the subsequent owner where applicable.
- Please refer to www.janitza.de for information concerning device revisions and the associated adjustments to the usage information accompanying the product.

Disposal
Please observe the national regulations. Dispose of individual parts, where necessary, depending on the properties and existing country-specific regulations, e.g. as:
- Electronic waste
- Batteries and accumulators
- Plastic
- Metals

or commission a certified disposal company with the scrapping.

Relevant laws, applied standards and directives
Please refer to the Declaration of Conformity on our web site (www.janitza.com) for the laws, standards and directives applied by Janitza electronics GmbH for the device.

2 Safety

Safety instructions
The installation instructions do not include a complete list of all safety measures necessary for operating the device.
Special operating conditions may require additional measures. The installation instructions contain notes that must be observed for your personal safety and to prevent property damage.

Symbols used on the device:

⚠	The additional symbol on the device itself indicates an electrical danger that can result in serious injuries or death.
⚠	The general warning symbol calls attention to possible risks of injury. Observe all the instructions listed under this symbol in order to prevent injuries or even death.

Safety instructions in the installation instructions are highlighted with a warning triangle and are presented as follows depending on the level of risk:

⚠ DANGER
Warns of an imminent danger that will result in serious or fatal injuries in the event of noncompliance.

⚠ WARNING
Warns of a potentially dangerous situation that can result in serious injuries or death in the event of noncompliance.

⚠ CAUTION
Warns of an imminently dangerous situation that can result in minor or moderate injuries in the event of noncompliance.

ATTENTION
Warns of an imminently dangerous situation that can result in property damage or environmental damage in the event of noncompliance.

ⓘ INFORMATION
Points out procedures in which there are **no** dangers of personal injuries or property damage.

Safety measures

When operating electrical devices, specific parts of these devices inevitably carry dangerous voltage. As a result, serious personal injuries or property damage can occur if they are not handled correctly:
- Before connecting the device, ground it at the ground wire connection if available.
- Dangerous voltages may be present in all circuit parts connected to the voltage supply.
- There may still be dangerous voltages present in the device even after it is disconnected from the supply voltage (capacitor storage).
- Do not operate equipment with open current transformer circuits.
- Do not exceed the threshold values specified in the user manual and on the rating plate. This must also be observed during inspections and commissioning.
- Observe the safety instructions and warning notices in the usage information that accompanies the devices and their components!

⚠ WARNING
Danger due to noncompliance with warning and safety instructions.
Noncompliance with warning and safety instructions on the device itself and in the information on using the device and its components can lead to injury or even death.
Observe safety instructions and warning notices on the device itself and in the usage information associated with the devices and their components, such as:
- Installation instructions.
- User manual.
- Safety instructions supplement.

Qualified personnel
To prevent personal injuries and property damage, only qualified personnel with electrical engineering training may work on the base unit and its components. They must also have knowledge
- of the national accident prevention regulations.
- of safety technology standards.
- in the installation, commissioning and operation of the device and the components.

⚠ WARNING
Risk of injury due to electric voltage or electrical current!
When handling electrical currents or voltages, serious personal injuries or death can occur due to:
- Touching live exposed or stripped cores.
- Device inputs that are dangerous to touch.

Before starting work on your system:
- **Disconnect it from the power supply!**
- **Secure it against being switched back on!**
- **Verify disconnection from power!**
- **Ground and short circuit!**
- **Cover or block off neighboring parts that are under voltage!**

Intended use
The device is
- intended for installation in switching cabinets and small installation distributors. The device can be installed in any mounting position (please observe section 3 “Assembly”).
- not intended for installation in vehicles! Using the device in mobile equipment is considered an unusual environmental condition and is only permissible by special agreement.
- not intended for installation in areas exposed to harmful oils, acids, gases, vapors, dust and radiation, etc.
- designed as an indoor meter.

Incoming goods inspection
The prerequisites for trouble-free and safe operation of the devices and their components include proper transport, storage, setup and assembly, as well as careful operation and maintenance.
Exercise caution when unpacking and packing the device, without using force and only using suitable tools.

Check:
- Devices and components by performing a visual inspection to ensure a flawless mechanical condition.
- The scope of delivery (see user manual) for completeness before beginning the installation of your devices and components.

If you assume that safe operation is no longer possible, shut down the device with components immediately and secure it from being unintentionally started back up again.

It can be assumed that safe operation is no longer possible, when, for example, the device with components:
- Has visible damage,
- No longer functions despite an intact power supply.
- Was subjected to extended periods of unfavorable conditions (e.g. storage outside of the permissible climate thresholds without adjustment to the room climate, condensation, etc.) or transport stress (e.g. falling from an elevated position, even without visible external damage, etc.).

3 Device short description and assembly

The device is a multifunctional power analyzer that
- measures and calculates electrical parameters, such as voltage, current, frequency, power, energy and harmonics, etc. in building installations, on distributors, circuit breakers and busbar trunking systems.
- displays and saves measurement results and transfers them via interfaces.

ATTENTION
Property damage due to noncompliance with the assembly instructions
Noncompliance with the assembly instructions can damage or destroy your device.
- **Ensure sufficient air circulation in your installation environment and, where applicable, sufficient cooling with high ambient temperatures.**
- **You can find more detailed information about the device functions, data, assembly in the device in the user manual.**

Mount the measurement device in switch cabinets or small distribution boards according to DIN 43880 (any installation position) on a 35 mm (1.38 in) DIN rail, as follows:

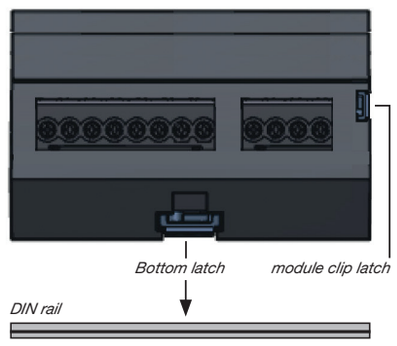


Fig. Device on DIN rail.

4 Connecting the supply voltage

The supply voltage level for your device can be found on the rating plate or in the technical data. After connecting the supply voltage, a display appears. If no display appears, check whether the supply voltage is within the rated voltage range.

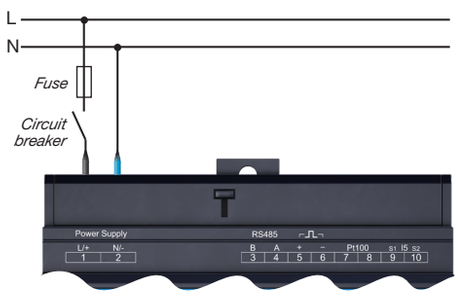
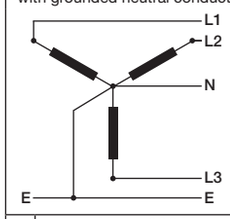
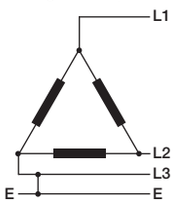


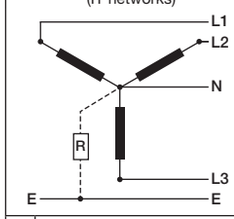
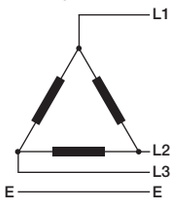
Fig. Example connection supply voltage

ATTENTION
Property damage due to noncompliance with the connection conditions or impermissible overvoltages
Noncompliance of the connection conditions or exceeding the permissible voltage range can damage or destroy your device.
Before you connect the device to the supply voltage, please observe the following:
- The voltage and frequency must comply with the specifications on the rating plate. Observe the limit values as described in the user manual.
- In building installations, secure the supply voltage with a UL/IEC-listed circuit breaker/fuse.
- The circuit breaker
  - must be easily accessible for the user and located in the vicinity of the device.
  - must be labeled for the respective device.
- Do not tap the supply voltage at the voltage transformers.
- Provide a fuse for the neutral conductor if the neutral conductor connection is not grounded to the source.

5 Network systems

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

Three-phase 4-conductor systems with grounded neutral conductor	Three-phase 3-conductor systems with grounded phase
	
IEC: U_{L-N}: 230 V, U_{L-L}: 400 V	U_{L-L}: 400 V

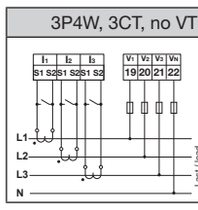
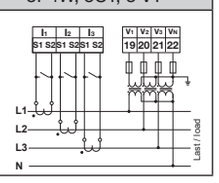
Three-phase 4-conductor systems with ungrounded neutral conductor (IT networks)	Three-phase 3-conductor systems ungrounded
	
IEC: U_{L-N}: 230 V, U_{L-L}: 400 V	U_{L-L}: 400 V

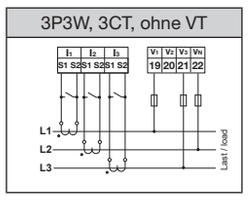
Application areas of the device:
- 3 and 4 conductor networks (TN, TT and IT networks).
- Residential and industrial sectors.

6 Voltage / Current measurement

The device
- has 4 voltage inputs
- measures current exclusively via a current transformer.
- permits connection of current transformers with a transformer ratio of ../1 A and ../5 A
- does not measure DC currents.

The current transformers require basic insulation according to IEC 61010-1:2010 for the rated voltage of the circuit.

3P4W, 3CT, no VT	3P4W, 3CT, 3 VT
	

3P3W, 3CT, ohne VT


⚠ WARNING
Risk of injury or damage to the device due to electrical voltage and improper connection!
Disregard of the conditions for the connections of the voltage and current measurement inputs may damage the device or cause serious injury or death. Connecting the voltage lines to the current measurement inputs also poses a fire hazard!
Therefore please abide by the following:
- **Switch off your installation before commencing work! Secure it against being switched on! Check to be sure it is de-energized! Ground and short circuit! Cover or block off adjacent live parts!**
- **Check the condition of the connections, including the cabling, especially the connection of the voltage and current measurement.**
- **Do not apply a DC voltage**
  - **to the voltage measurement inputs.**
  - **Equip the voltage measurement inputs with a suitable, marked fuse and isolation device (alternatively: line circuit breaker) located nearby.**
  - **The voltage measurement inputs are dangerous to touch.**
- **Connect voltages that exceed the permissible nominal network voltages via a voltage transformer.**
- **Measured voltages and currents must originate from the same network.**

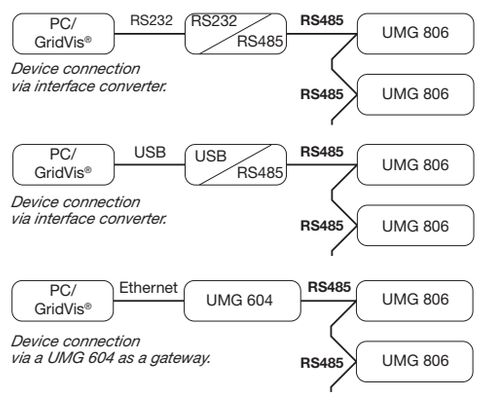
⚠ WARNING
Risk of injury due to high currents and high electrical voltages!
Serious personal injuries or death can occur due to:
- Touching live exposed or stripped cores.
- Device inputs that are dangerous to touch.

Therefore, please observe the following for your system:
- **Before starting work, disconnect it from the power supply!**
- **Secure it against being switched back on!**
- **Verify disconnection from power!**
- **Ground and short circuit! Use the ground connection points with the ground symbol for grounding!**
- **Cover or block off neighboring parts that are under voltage!**

⚠ WARNING
Electrical currents and voltages!
Open current transformers that are operated on the secondary side (high voltage spikes) can result in serious personal injuries or even death.
Avoid the open operation of the current transformers and short-circuit unloaded transformers.

7 Establishing the connection to the PC

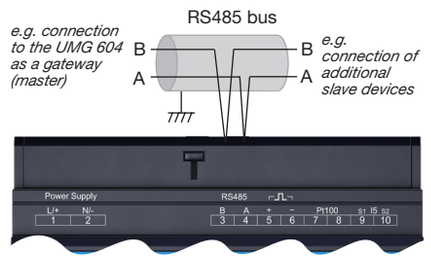
The most common connections for the communication between the PC and device:

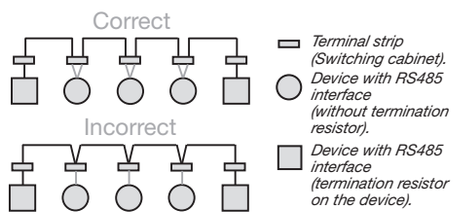


⚠ CAUTION
Property damage due to incorrect network settings.
Incorrect network settings can cause faults in the IT network!
Consult your network administrator for the correct network settings for your device.

Example: PC connection via RS485 interface and UMG 604 as the gateway
The PC connection to the device via the RS485 serial interface with, e.g. a UMG 604 as the gateway (see section “Establishing the connection to the PC”) is a method for configuring the device(s)/and reading out data.

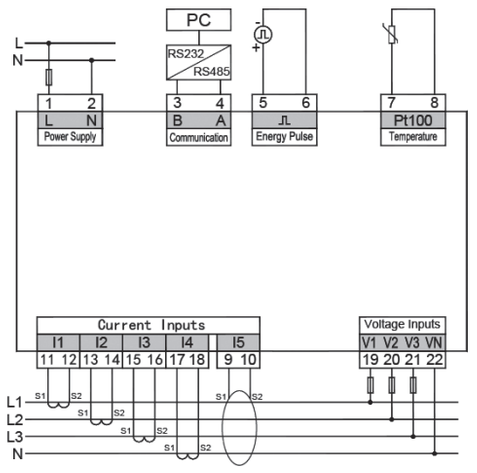
RS485 bus structure
- Connect all devices in the RS485 bus structure (line) according to the master/slave principle.
- A segment of a RS485 bus structure can contain up to 32 participants/devices.
- Terminate the cable with termination resistors (120 Ω, 0.25 W) at the beginning and end of a segment. The device does not contain a termination resistor.
- With more that 32 participants, use repeaters to connect segments.
- Further information, e.g. Cable type, refer to the user manual.



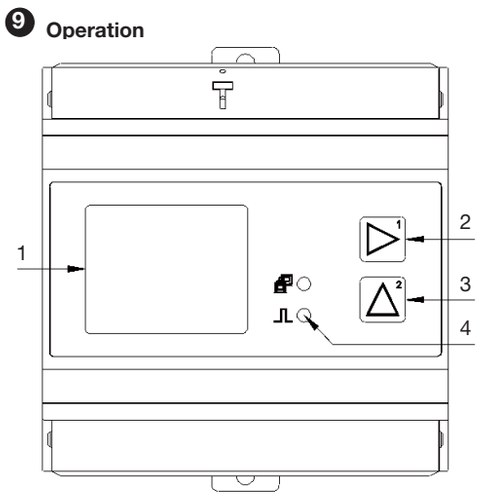


ATTENTION
Using the corresponding menu items, assign the slave devices in the RS485 bus structure
- Different device addresses.
- Different device addresses compared to the master device (UMG 604).
- The same transmission rate (baud rate).
- The same data frame.

8 Wiring of UMG 806



9 Operation



(1) Display
(2) Button 1
(3) Button 2
(4) Indicator lights

Configure device:
- Press and hold buttons 1 and 2 simultaneously for 1 s to switch between display and configuration mode.
- Enter the password with button 1 (confirm / change digit position) and 2 (increase digit) in the display CodE (factory setting: 0000 - no password).
- The 1st parameter address 000 appears for the configuration of the primary current transformers I1-I3. Configure with buttons 1 and 2, if necessary, additional parameters (see table „Basic parameters“).

  A parameter list for further configuration can also be found in the user manual (www.janitza.de).

- To complete and save your configuration, press buttons 1 and 2 simultaneously.
- The device switches to display mode.

ⓘ INFORMATION
- A detailed description of the configuration of the device and the parameters can be found in the user manual.
- Other usage information, such as the user manual or a Modbus address list can be found on our homepage www.janitza.de under Support> Download.

Basic parameters

Adress	Description
000	Current transformer, primary, I1..I3
001	Current transformer, secondary, I1..I3
002	Voltage transformer, primary, V1..V3 (L1..L3).
003	Voltage transformer, secondary, V1..V3 (L1..L3)
010	Current transformer, primary, I4
011	Current transformer, secondary, I4
020	Residual current transformer, primary, I5
021	Residual current transformer, secondary, I5
110	Network system / wiring 0: 3P4W (default setting) 1: 3P3W 2: 1P2W
200	Device address (1 .. 247)
201	Baud rate, RS485 0 = 9600 bit/s 1 = 19200 bit/s 2 = 38400 bit/s 3 = 57600 bit/s 4 = 115200 bit/s
202	RS485, parity 0 = N.8.1 1 = E.8.1 2 = O.8.1 3 = N.8.2
203	RS485, mode 0 = Modbus RTU / slave 1 = gateway

10 Technical data

General information	
Net weight	300 g (0.66 lb)
Device dimensions	approx. w = 90 mm (3.54 in), h = 90 mm (3.54 in), d = 63.5 mm (2.50 in)
Horizontal pitches	5 HP
Battery	Type CR2032, 3 V, Li-Mn
Service life of the backlight	45000 h (50 % of the starting brightness)
Installation position	discretionary
Impact resistance	IK04 according to IEC 62262

Transport and storage The following information applies to devices which are transported and stored in the original packaging.	
Free fall	1 m (39.37 in)
Temperature	-30 °C (-22 °F) up to +80 °C (176 °F)
Relative humidity	5 to 95 % at 25 °C (77 °F) without condensation

Ambient conditions during operation	
The device • must be used in a weather-protected, stationary application. • fulfills the operating conditions according to DIN IEC 60721-3-3. • possesses protection class II according to IEC 60536 (VDE 0106, Part 1), a ground wire connection is not required!	
Measurement temperature range	-25 °C (-13 °F) .. +70 °C (158 °F)
Relative humidity	5 to 95 % at 25 °C (77 °F) without condensation
Operating height	< 2500 m (1.55 mi) above sea level
Pollution degree	2
Ventilation	No external ventilation required.
Protection against foreign bodies and water	IP20 i.a.w. EN60529

Supply voltage	
Nominal range	AC/DC: 80 V - 270 V
Operating range	+/-10% of the nominal range
Power consumption	max. 7 VA
Recommended overcurrent protection device for the line protection	5 A (char. B), IEC-/UL approval

Voltage measurement	
3-phase 4-conductor systems with rated voltages up to	230 V_{LN} / 400 V_{LL} (+/-10%) acc. IEC
3-phase 3-conductor systems with rated voltages up to	400 V_{L-L} (+/-10%) acc. IEC
Overvoltage category	300 V CAT III acc. IEC
Rated surge voltage	4 kV
Fuse for the voltage measurement	1 - 10 A tripping characteristic B (with IEC/UL approval)
Metering range L-N	0 .. 230 V_{rms} (max. overvoltage 277 V_{rms})
Metering range L-L	0 .. 400 Vrms (max. overvoltage 480 V_{rms})
Resolution	0.1 V
Crest factor	2 (based on the metering range 230 V L-N)
Impedance	≥ 1.7 MΩ/phase
Power consumption	approx. 0.1 VA / phase
Sampling frequency	8 kHz / phase
Frequency of the basic oscillation - resolution	45 Hz .. 65 Hz 0.01 Hz
Harmonics	1 .. 31.

Current measurement (../1A) (../5A)	
Rated current	5 A
Channels	4
Metering range	0.005 .. 6 A_{rms}
Crest factor (based on the rated current)	2
Overload for 1 sec.	100 A (sinusoidal)
Resolution	1 mA
Overvoltage category	300 V CATII
Rated surge voltage	4 kV
Power consumption	approx. 0.2 VA
Sampling frequency	8 kHz
Harmonics	1 .. 31.

Current measurement (0 .. 40 mA, AC)	
Channel (I5)	1

Digital output Energy pulse output	
Switching voltage	max. 35 V DC
Switching current	max. 10 mA_{eff} DC
Response time	approx. 500 ms
Pulse width	80 ms ±20 %
Pulse output (energy pulse)	max. 10 Hz

Temperature measurement	
Update time	1 s
Total burden (sensor and lead)	max. 0.35 kΩ
Suitable sensor types	PT100

Line length (digital output; temp. measurement)	
Up to 30 m (32.81 yd.)	Unshielded
Greater than 30 m (32.81 yd.)	Shielded

RS485 interface 2-wire connection.	
Protocol	Modbus RTU
Transmission rate	up to 115.2 kbps

Terminal connection capacity (supply voltage) Connectable conductors. Only one conductor can be connected per terminal.	
Single core, multi-core, fine-stranded	0.14 - 2.5 mm², AWG 26-14
Cable end sleeve (not insulated)	0.25 - 2.5 mm², AWG 23-14
Cable end sleeve (insulated)	0.25 - 1.5 mm², AWG 23-16
Tightening torque	0.5 - 0.6 Nm (4.4 - 5.3 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 - 4 mm², AWG 24-12
Cable end sleeve (not insulated)	0.25- 2.5 mm², AWG 23-14
Cable end sleeve (insulated)	0.25 - 1.5 mm², AWG 23-16
Tightening torque	0.5 - 0.6 Nm (4.4 - 5.3 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	0.2 - 4 mm², AWG 24-12
Cable end sleeve (insulated/not insulated)	0.25- 2.5 mm², AWG 23-14
Stripping length	7 mm (0.2756 in)

Terminal connection capacity (RS485, digital output, temp. measurement)	
Single core, multi-core, fine-stranded	0.2 - 4 mm², AWG 24-12
Cable end sleeve (not insulated)	0.25- 2.5 mm², AWG 23-14
Cable end sleeve (insulated)	0.25 - 1.5 mm², AWG 23-16
Tightening torque	0.5 - 0.6 Nm (4.4 - 5.3 lbf in)
Stripping length	7 mm (0.2756 in)

ⓘ INFORMATION
Additional technical data can be found in the user manual for the device at *www.janitza.com*

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