

Modular expandable energy analyzer UMG 800

Installation manual

- Installation
- Device settings



Measuring device -
front view

User Manual:



Janitza electronics GmbH
Vor dem Polstück 6
35633 Lahnau | Germany
Support +49 6441 9642-22
info@janitza.com | www.janitza.com

Janitza®

Relevant laws, standards and directive used

Please see the declaration of conformity on our website (www.janitza.com) for the laws, standards and directives applied for the device by Janitza electronics GmbH.

i INFORMATION

Our usage information uses the grammatical masculine form in a gender-neutral sense! This form always refers equally to women, men and diverse. In order to make the texts more readable, distinctions are not made. We ask for your understanding for these simplifications.

1

General

Disclaimer

Compliance with the usage information for the devices is a prerequisite for safe operation and attaining the stated performance characteristics and product features. Janitza electronics GmbH assumes no liability for bodily injury, material damage or financial losses which result from disregard of the usage information. Ensure that your informational products are readily accessible in a legible form.

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

Copyright notice

© 2024 - Janitza electronics GmbH - Lahnau.
All rights reserved. Any reproduction, processing, distribution or other use, in whole or in part, is prohibited.

Subject to technical alterations

- Make sure that your device matches the installation manual.
- First make sure you have read and understood the usage information accompanying the product.
- Device illustrations in this document may differ from the actual condition of the delivered device.

- Keep the usage information associated with the product available for the entire service life and pass it on to any possible subsequent users.
- Please find out about device revisions and the associated modifications of the usage information associated with your product at www.janitza.com.

Disposal

Please abide by national regulations! Dispose of individual parts, as applicable, depending on their composition and existing country-specific regulations, e.g. as:

- Electronic waste
- Batteries and rechargeable batteries
- Plastics
- Metals

or engage a certified disposal company to handle scrapping.

2

Safety

Safety information

The installation manual does not represent a complete set of all safety measures required for the operation of the device. Special operating conditions can require additional measures. The installation manual contains information which must be observed to ensure your personal safety and avoid material 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.
	This general warning symbol draws attention to a possible risk of injury. Be certain to observe all of the information listed under this symbol in order to avoid possible injury or even death.

Safety information in the installation manual is marked by a warning triangle and, in dependence on the degree of hazard, is displayed as follows:

⚠ DANGER

Warns of an imminent danger which, if not avoided, results in serious or fatal injury.

⚠ WARNING

Warns of a potentially hazardous situation which, if not avoided, could result in serious injury or death.

⚠ CAUTION

Warns of an immediately hazardous situation which, if not avoided, can result in minor or moderate injury.

ATTENTION

Warns of an immediately hazardous situation which, if not avoided, can result in material or environmental damage.

i INFORMATION

Indicates procedures in which there is **no** hazard of personal injury or material damage.

Safety measures

When operating electric devices, it is unavoidable for certain parts of these devices to conduct hazardous voltage. Consequently, severe bodily injury or material damage can occur if they are not handled properly:

- Before making connections to the device, ground the device by means of the ground wire connection, if present.
- Hazardous voltages can be present in all circuitry parts that are connected to the power supply.
- There can still be hazardous voltages present in the device even after it has been disconnected from the supply voltage (capacitor storage).
- Do not operate equipment with current transformer circuits when open.
- Do not exceed the limit values specified in the user manual and on the rating plate! This must also be observed during testing and commissioning!
- Observe the safety information and warning notices in the usage information associated with the device and its components!

⚠ WARNING

Hazard due to disregard of warning notices and safety information!

Disregard of warning notices and safety information on the device itself and in the usage information for the device and its components can lead to injuries or even death! Observe the safety information and warning notices on the device itself and in the usage information associated with the devices and their components, such as:

- Installation manual.
- User manual.
- Supplement Safety Information.

Qualified personnel

To avoid bodily injury and material damage, only qualified personnel with electrical training are permitted to work on the basic device and its components who have knowledge of:

- The national accident prevention regulations.
- Safety technology standards.
- Installation, commissioning and operation of the device and the components.

⚠ WARNING

Risk of injury due to electric voltage or electric current!

When handling electric currents or voltages, serious bodily injury or death can result from:

- Touching bare or stripped leads that are energized.
- Device inputs that pose a hazard when touched.

Before starting work on your system:

- **Disconnect the supply of power!**
- **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!**

Intended use

The device is

- only intended for use in industrial areas.
- intended for installation in switch cabinets and small distribution boards. They can be installed in any position (please refer to step 4 „Mounting“).
- designed as an indoor meter.

The device is **not** intended for

- installation in vehicles! Use of the device in non-stationary equipment is considered an exceptional environmental condition and is only permitted by special agreement.
- installation in environments with harmful oils, acids, gases, vapors, dusts, radiation, etc.
- installation in potentially explosive atmospheres.

Incoming goods inspection

The prerequisites for trouble-free and safe operation of the devices, modules and components include proper transport, storage, setup and assembly, as well as proper operation and maintenance.

Exercise due caution when unpacking and packing the device, do not use force and only use suitable tools. Check:

- Visually inspect the devices, modules and components for flawless mechanical condition.
- Check the scope of delivery (see user manual) for completeness before you begin installing your devices, modules and components.

If it can be assumed that safe operation is no longer possible, take your device, module or component out of operation immediately! Secure against unintentional startup.

It can be assumed that safe operation is impossible if the basic device, module or component, for example:

- 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.).

Self-resetting fuse of the measuring device:

ATTENTION

The measuring device and connected modules may lose data if the self-resetting fuse is triggered in the event of a short circuit or overload!

In the event of a short-circuit fault or overload of the measuring device with connected modules, the self-resetting fuse of the measuring device switches off the modules. Then proceed as follows:

- Disconnect the measuring device from the power supply and allow it to cool down (approx. 15 min., depending on the ambient temperature), observing the safety instructions.
- Eliminate the short-circuit fault or overload on the measuring device, e.g. by checking the bus connector installation or reducing the number of modules on the measuring device.
- Finally, supply the measuring device with power again.

3

Brief description of the device

The measuring device

- is a modular expandable multifunctional measuring device for recording power quality parameters.
- measures and calculates electrical quantities such as voltage, current, frequency, power, energy, harmonics, etc. in building installations, on distribution boards, circuit breakers and busbar trunking systems, in some cases via modules.
- stores and transmits measurement results for further processing via interfaces.
- is a DIN rail measuring device and shows measurement results on compatible external displays, e.g. the RD 96 on the USB interface.
- is suitable for connecting modules (e.g. expandable to up to 96 current measurement channels)
- provides a RS485 gateway functionality and serves as a buffer for measurement data.
- is predestined for energy monitoring and use in data centers.
- includes an integrated web server that displays a wide range of data in a clear format on a measuring device homepage.

Measuring device - 3D view



ⓘ INFORMATION

- Detailed descriptions of the basic device can be found in the user manual.
- Note other functions of the measuring device in combination with modules in the usage information for the modules.
- Descriptions of compatible external displays, in particular the RD 96, can be found in separate usage information in the download area at www.janitza.com.

Mounting

⚠ CAUTION

Disregard of the installation instructions may cause property damage or personal injury!

Non-observance of the installation instructions may cause damage to your basic device with module or destroy it and/or may also result in personal injury.

In addition to the installation instructions for your module, also observe the installation instructions for your basic device, in particular the safety information and warning notices.

Before installing modules

- **Disconnect the supply of power to the system!**

- **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!**

- Provide adequate air circulation in your installation environment and cooling, as needed, when the ambient temperatures are high.

- Return defective modules to Janitza electronics GmbH in accordance with the shipping instructions for air or road freight (complete with accessories).

- All usage information is also available as a download at www.janitza.com.

- Further information on device functions, data, mounting and the battery used in the device can be found in the user manual.

① INFORMATION

- To implement measuring device and module topologies, the scope of delivery of the measuring device includes a bus connector (2TE). Before you start mounting and wiring your DIN rail measuring device, make sure that the bus connector is mounted on the back of your measuring device. The bus connector serves as a JanBus interface via which you connect modules.
- When mounting the device on a DIN rail, observe the dimensions of the terminals used at the connections of the device! Provide sufficient free space for the wiring!

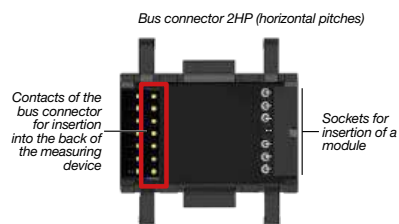


Fig.: Bus connector of the measuring device as a JanBus interface for connecting a module.

3. Press your measuring device with bus connector frontally onto the DIN rail until the bottom bolts engage (click).

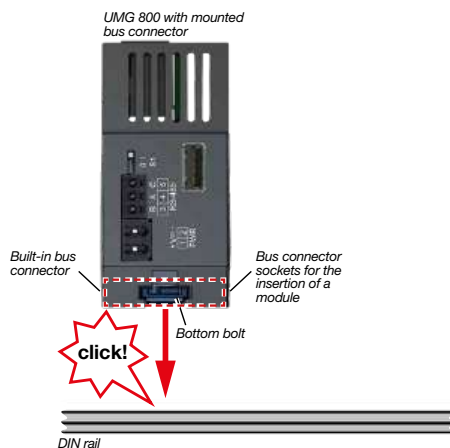


Fig. Measuring device view from below

4. Finally, wire up your measuring device. (For measuring device and module topologies, please note the usage information for all integrated devices and modules).
5. Install and couple additional modules, e.g. current measurement modules or digital input modules, by pushing their bus connector contacts into the sockets of the measuring device bus connector.

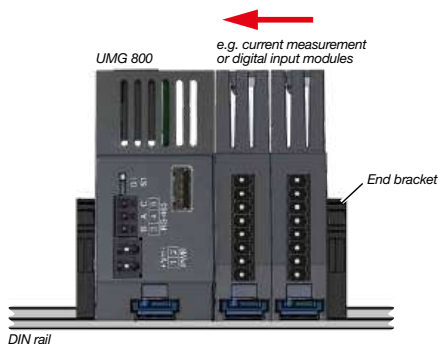


Fig. Example of a measuring device and module topology

Mount the measuring device in switch cabinets or small distribution boards in accordance with DIN 43880 on a 35 mm (1.38 in) DIN rail (for type, see technical data) as follows:

1. If not already done, plug the contacts of the bus connector (JanBus interface) into the sockets on the rear of the measuring device.

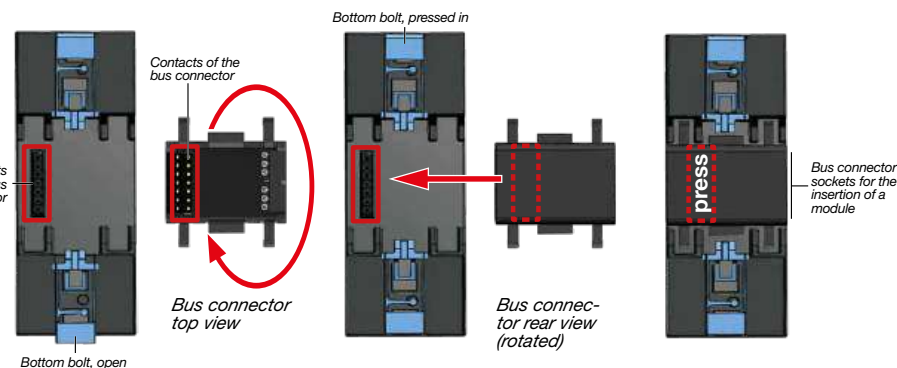


Fig.: Rear views of the measuring devices

Operating and display elements

Options for commissioning and configuring the measuring device and displaying measurement data are available via:

1. an IP address of the measuring device (see step „Ethernet communication“).
2. the USB interface with a USB storage medium (FAT32 formatted) or connected separately available display (e.g. the RD 96). For further information, see step „USB interface“.

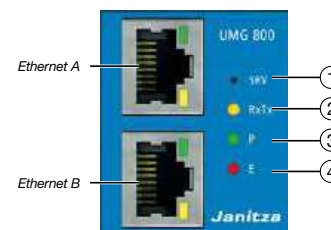


Fig. Measuring device front with operating and display elements

Item	Description
1	SRV - Service button - Press for 3 seconds - Measuring device restart. - Press for 10 seconds - Reset to factory settings with assignment of IP modes and measuring device restart: - Ethernet A = DHCP mode (Dedicated mode) - Ethernet B = Static IP address 10.10.10.200
2	RxTx (Receive data, Transmit data) - LED (Yellow) - Lights up (permanently) in the event of a module communication error. - Flashes during operation and signals cyclical data exchange. - Flashes slowly at startup (initialization). - Off - Measuring device in operation but no module connected (no data exchange).
3	P (Power) - LED (Green) - Lights up at start (initialization). - Lights up when the power supply is correct. The measuring device is ready for operation. - Flashes during communication at the USB interface. - Off - Measuring device without power supply.
4	E (Error) - LED (Red) - Lights up at start (initialization) and in case of an error. - Flashes in the event of an overvoltage greater than 520 Vrms (L-N). - Off - Measuring device is working correctly.

① INFORMATION

- After a successful start (initialization), the user can recognize a correctly functioning measuring device by the green LED (P) lighting up and the yellow LED (RxTx - cyclical data exchange) flashing.
- For more information on operation, commissioning and in the case of an error, see the user manual!

6

Applying the supply voltage

Only operate the measuring device with a supply voltage of 24 V DC (PELV - Note the polarity!) (see rating plate and technical data). After connecting the supply voltage and after the „boot process“, the green LED (P) lights up. If no LED appears, check whether the supply voltage is within the nominal voltage range.

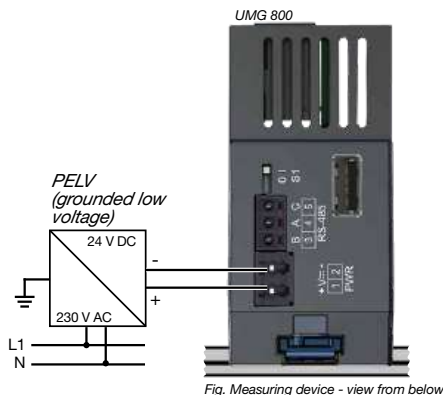


Fig. Measuring device - view from below

ATTENTION

Material damage due to disregard of the connection conditions or impermissible overvoltages!

Disregard of the connection instructions or exceeding the permissible voltage range can damage or destroy your device.

Before connecting the device to the supply voltage, please note:

- Voltage and frequency must correspond to the specifications on the rating plate! Observe limit values as described in the user manual!
- In the building installation, secure the supply voltage with a UL/IEC listed line circuit breaker/fuse!
- Observe the following for the isolation device:
 - Install it close to the device and easily accessible for the user.
 - Mark it for the respective device.
- Do not remove the supply voltage from the voltage transformers.
- Provide a fuse for the neutral conductor if the neutral conductor terminal of the source is not grounded.

INFORMATION

Use a separate, grounded power supply unit (PELV) for the power supply for each measuring device!

7

Grid systems

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

	Three-phase 4-conductor systems with grounded neutral conductor	Three-phase 4-conductor systems with non-grounded neutral conductor (IT networks)	Three-phase 3-conductor systems ungrounded	Three-phase 3-conductor systems with grounded phase
IEC	U _{L-N} / U _{L-L} : 270 V _{L-N} / 480 V _{LL}	U _{L-L} : 480 V _{LL}		U _{L-L} : 480 V _{LL}
UL	U _{L-N} / U _{L-L} : 270 V _{L-N} / 480 V _{LL}	U _{L-L} : 480 V _{LL}		U _{L-L} : 480 V _{LL}

Application areas for the device

- 3 and 4-conductor networks (TN, TT and IT networks).
- Residential and industrial areas.

8

Voltage measurement

The device has 4 voltage measurement inputs and is suitable for various connection variants.

WARNING

Risk of injury or damage to the device due to electrical voltage and improper connection!

Failure to comply with the connection conditions for the voltage measurement inputs can result in damage to the device or serious injury, including death. Therefore, please observe 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!**
- 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.

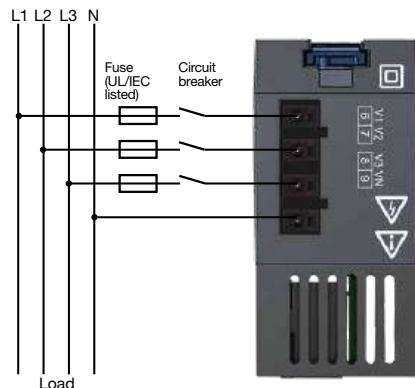
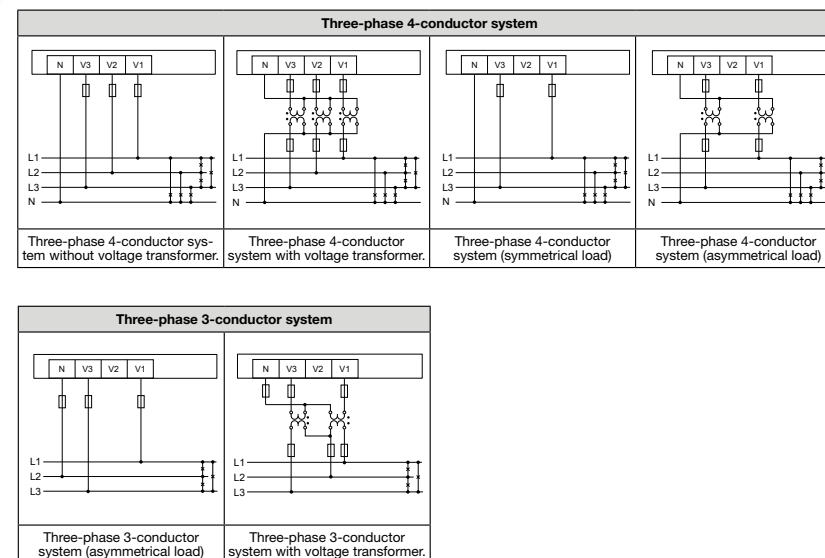


Fig. Connection example for "voltage measurement".
Measuring device - view from above.

The voltage measurement inputs are designed for measurements in low-voltage networks in which nominal voltages occur as described in the "Technical data".

9

Connection variants for voltage measurement



10

Ethernet communication

ATTENTION

Material damage due to security vulnerabilities in programs, IT networks and protocols.

Security vulnerabilities can lead to data misuse and faults and even the standstill of your IT infrastructure. To protect your IT system, network, data communications and measurement devices:

- Inform your network administrator and/or IT representative.
- Always keep the meter firmware up to date and protect the communication to the meter with an external firewall. Close unused ports.
- Take protective measures against viruses and cyber attacks from the Internet, e.g. through firewall solutions, security updates and virus protection programs.
- Eliminate security vulnerabilities and update or renew existing protection for your IT infrastructure.

ATTENTION

Material 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.

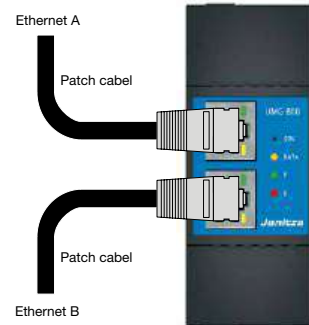
Your measurement device has two Ethernet interfaces (A and B) for communication in Ethernet networks. When the measuring device is delivered, the Ethernet interfaces are configured as follows:

Ethernet interface A:

DHCP mode (Dedicated mode) - the measuring device is assigned an IP address by a DHCP server in a network.

Ethernet interface B:

Static mode with IP address 10.10.10.200



Recommendation:

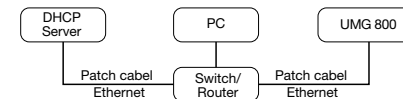
Use at least CAT5 cable!

11

PC connections

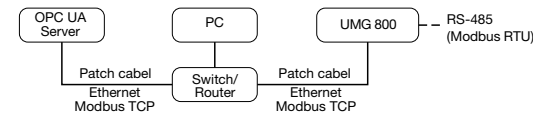
The most common connection methods for communication of the measurement device with a PC (with GridVis® software installed) are described below.

1. Connection to a DHCP server and PC. The DHCP server automatically assigns IP addresses to the device (Ethernet A) and the PC.



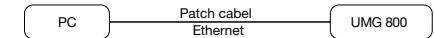
The DHCP server automatically assigns IP addresses to device and PC.

2. Connection as master device with an RS-485 bus structure (Modbus RTU) to a PC and OPC UA server.



Connection of the device with a patch cable (Ethernet interface) via a switch/router to the OPC UA server and the PC.

3. PC direct connection to the device. PC and device require a fixed IP address.



PC and device require a fixed IP address.

INFORMATION

- Ask your network administrator about the Ethernet network settings for your measuring device.
- Descriptions of the communication interfaces can be found in the user manual.

12

USB interface

The measuring device has a USB interface (type A) for connecting a USB storage medium (type FAT32 formatted) or an external display, e.g. the RD 96 (available separately).

USB storage medium

With a USB storage medium and the corresponding files on the USB interface of the measuring device, the following options are available:

1. Execute a measuring device firmware update (read firmware update file).
2. Transfer (read and/or write) a network configuration file for the Ethernet interfaces (A and B).

INFORMATION

- When **updating the measuring device firmware or configuring the network**, only insert the USB storage medium with the corresponding files into the USB interface **after** the measuring device has been started! Otherwise the measuring device will not perform any action!
- Detailed information on firmware updates and network configuration via the USB interface can be found in the user manual.



Fig. Measuring device - view from below

13

External display RD 96 - Optional

With an optionally available RD 96 display on the USB interface of the measuring device, you can configure the following functions of the measuring device:

- Ethernet A
- Ethernet B
- Fieldbus (RS485 interface)
- Current transformer (only with connected current measurement modules)
- Voltage transformer
- Display functions (language, standby and brightness)

- System functions (PIN, restart, time and date)
- Reset/restore (factory settings, configuration, min/max/avg. values, energy values and historical data)

INFORMATION

Descriptions of the RD 96 can be found in the usage information for the display.



USB cable (USB type A plug to type B plug, included with the RD 96) for connection to the USB interface of the measuring device.

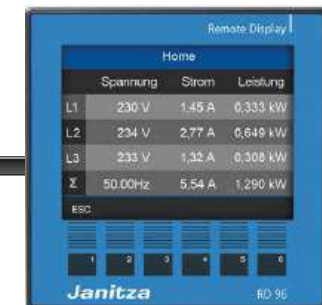


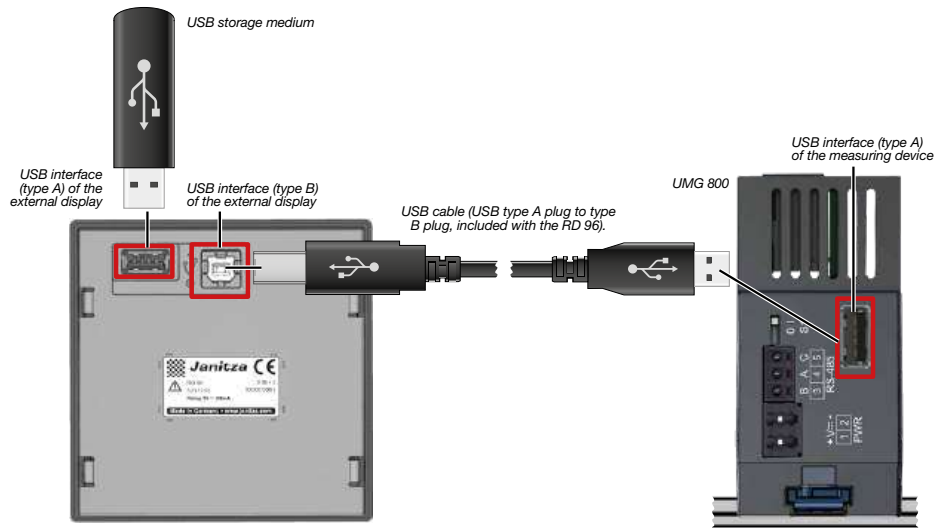
Fig. External display RD96

14

Using a USB storage medium on the RD 96

Another option for a firmware update or a network configuration for the measuring device is

via the USB interface 2.0 (type A) of a connected external display (e.g. RD 96):



15

Communication via OPC UA

Data is transferred using the OPC UA protocol via the Ethernet interfaces of your measuring device.

The Ethernet interface and the data transfer using the OPC UA protocol can be configured conveniently in the GridVis® software.

❗ INFORMATION

- Consult your network administrator for the correct Ethernet network settings for your measuring device.
- Descriptions of the communication interfaces can be found in the user manual.
- Information on the connection and communication of your measuring device with the software can be found in the corresponding help formats (e.g. online help for the software).
- The standardized data exchange procedure OPC UA requires advanced knowledge of its architecture! Only persons with proven specialist knowledge may work on the interfaces with OPC UA architecture!

16

Configure voltage transformers and configure current transformers of the connected current measurement modules

The measuring device has the following options for configuring voltage transformers and current transformers of the current measurement modules connected to the UMG 800:

- Voltage transformer and current transformer settings are loaded with the commissioning file via the USB interface.
- Configuration via the function keys of an external display (e.g. RD 96) under Menu > Configuration > Voltage transformer (or current transformer for the connected modules).
- Configuration via the integrated web server on the measuring device homepage.
- Configuration in the GridVis software.

❗ INFORMATION

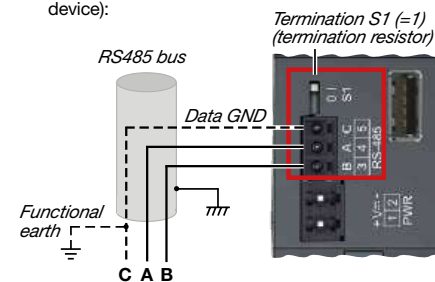
- Connect measuring transformers in accordance with their specifications on the device rating plate and the technical data!
- The factory settings for the voltage transformers on the measuring device are 400 V (primary) / 400 V (secondary).
- Descriptions on safety, handling and configuration of the voltage transformer ratios can be found in the user manual for the device.
- Descriptions of the configuration of the current transformer ratios of the connected current measurement modules can be found in the usage information for the current measurement modules.

17

RS485 interface

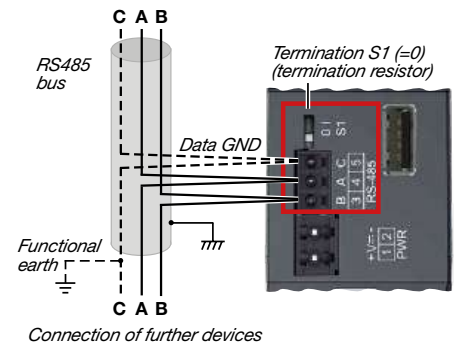
The measuring device has a 3-pin RS485 interface (serial) for communication via the Modbus RTU protocol.

Connection example at the beginning or end of a bus topology as a client device (formerly master device):



Connection example in the middle of a bus topology as a server device (formerly slave device):

Connection of further devices



❗ INFORMATION

- If you use the measuring device as a client device (formerly master device), always position it at the beginning or end of a bus segment! Terminate the integrated termination resistor - S1 to switch position „I“ (on). Use Unitronic Li2YCY(TP) 2x2x0.22 cables (Lapp cables) for bus wiring.
- An RS485 bus structure contains up to 32 participants/devices. Use repeaters for more than 32 participants/devices!
- To prevent the addition of leakage currents when using several devices, install the Data GND as a functional earth (see illustrations above)!
- Detailed information on the RS485 interface can be found in the user manual.

Technical data

General	
Net weight (with plug-in terminals)	approx. 120 g (0.265 lb)
Device dimensions	approx. B = 36 mm (1.42 in), H = 90 mm (3.54 in), D = 76 mm (2.99 in)
Width of the device in horizontal pitches	2 HP (1 HP = 18 mm)
Battery	Type Lithium CR1632, 3 V not changeable (UL1642 approval)
Integrated memory	4 GB
Mounting orientation	As desired
Fastening/mounting - Suitable DIN rails - 35 mm (1.38 in)	· TS 35/7.5 according to EN 60715 · TS 35/10 · TS 35/15 x 1.5
Clock error - in the temperature range from 18 °C (64 °F) .. 28 °C (82 °F)	± 5 ppm (corresponds to 3 min./year)
Impact resistance	IK07 according to IEC 62262
Transport and storage	
The following specifications apply for devices transported and stored in the original packaging.	
Free fall	1 m (39.37 in)
Temperature	-25 °C (-13 °F) to +70 °C (158 °F)
Relative humidity	5 to 95% at 25 °C (77 °F), no condensation

Environmental conditions during operation	
The device: · Is for weather-protected and stationary use. · Fulfills operating conditions according to DIN IEC 60721-3-3. · Has protection class II according to IEC 60536 (VDE 0106, part 1), a ground wire connection is not required!	
Rated temperature range	-10 °C (14 °F) to +55 °C (131 °F)
Relative humidity	5 to 95% at 25 °C (77 °F) no condensation
Operating elevation	0 ... 2000 m (0 ... 1.24 mi) above sea level
Pollution degree	2
Ventilation	No forced ventilation required.
Protection against foreign matter and water	IP20 according to EN60529
Supply voltage	
Nominal range	DC: 24 V, PELV (grounded power supply unit)
Operating range	+/-10% of nominal range
Power consumption	2.5 W
Maximum power consumption with modules and external display	14 W
Recommended overcurrent protective device for line protection	2-6 A, (Char. B), IEC/UL approval

Voltage measurement	
Three-phase 4-conductor systems with rated voltages up to	277 V _{LN} / 480 V _{LL} (+/-10%) according to IEC 277 V _{LN} / 480 V _{LL} (+/-10%) according to UL
Three-phase 3-conductor systems (grounded) with rated voltages up to	480 V _{L-L} (+/-10%) according to IEC 480 V _{L-L} (+/-10%) according to UL
Three-phase 3-conductor systems (non-grounded) with rated voltages up to	480 V _{L-L} (+/-10%) according to IEC 480 V _{L-L} (+/-10%) according to UL
Overvoltage category	300 V CAT III according to IEC 300 V CAT III according to UL
Rated surge voltage	4 kV
Protection of the voltage measurement	1 - 10 A tripping characteristic B (with IEC/UL approval)
Measuring range L-N	0 ... 300 V _{rms} (max. overvoltage 520 V _{rms}) The device only measures if a voltage L-N greater than 20 V _{rms} is applied to L1.
Measuring range L-L	0 ... 520 V _{rms} (max. overvoltage 900 V _{rms}) The device only measures if a voltage L-N of greater than 34 V _{rms} is applied to L1-L2 or L1-L3.
Measuring range N-PE	0 ... 300 V _{rms}
Resolution	0.01 V
Crest factor	2 (referred to measuring range)
Impedance	3 MΩ/phase
Power consumption	approx. 0.1 VA
Sampling frequency	51.2 kHz
Frequency of fundamental oscillation - Resolution	40 Hz ... 70 Hz 0.01 Hz
Harmonics	1 ... 63.

Periphery

RS-485 interface	
3-wire connection with A, B, GND.	
Protocol	Modbus RTU/Server (formerly Slave) Modbus RTU/Gateway
Transmission rate	9.6 kbps, 19.2 kbps, 38.4 kbps, 57.6 kbps, 115.2 kbps
Termination	DIP switches (S1)

Ethernet interfaces	
Connection	2 x RJ45
Function	Modbus Gateway, Embedded Web-server (HTTP)
Protocols	TCP/IP, DHCP-Client (BootP), Modbus/TCP (Port 502), ICMP (Ping), NTP, FTP

USB interface	
Connection	USB 2.0, Type A
Function	Connection for · external Display. · USB storage medium (FAT32 formatted) with the firmware update file and/or network configuration file.

Connection capacity of the terminals - Supply voltage	
Connectible conductors: Only connect one conductor per terminal point!	
Single core, multi-core, fine-stranded	0.2 - 4 mm ² , AWG 28-12
Wire ferrules (insulated/non-insulated)	0.2 - 2.5 mm ² , AWG 26-14
Tightening torque	0.4 - 0.5 Nm (3.54 - 4.43 lbf in)
Strip length	7 mm (0.2756 in)

Connection capacity of the terminals - Voltage measurement	
Connectible conductors: Only connect one conductor per terminal point!	
Single core	0.5 - 1.5 mm ² , AWG 21-16
Fine-stranded	0.5 - 2.5 mm ² , AWG 21-14
Wire ferrules (insulated/non-insulated)	0.5 - 2.5 mm ² , AWG 21-14
Strip length	10 mm (0.3937 in)

Connection capacity of the terminals - RS485	
Single core, multi-core, fine-stranded	0.2 - 1.5 mm ² , AWG 28-16
Wire ferrules (insulated/non-insulated)	0.2 - 1.5 mm ² , AWG 28-16
Tightening torque	0.2 - 0.25 Nm (1.77 - 2.21 lbf in)
Strip length	7 mm (0.2756 in)

Potential isolation and electrical safety of the interfaces
The interfaces (RS485, Ethernet und USB) have: · a double insulation to the voltage measurement inputs. · a functional insulation against each other, to the supply voltage, to the measuring inputs. The interfaces of the connected devices require double or reinforced insulation against mains voltages (according to IEC 61010-1).

INFORMATION

Detailed technical data can be found in the user manual for the measuring device at www.janitza.com.

Procedure in the event of a malfunction

Failure mode	Cause	Remedy
No display (LED)	External fuse for the supply voltage has tripped.	Replace fuse.
No voltage measurement	No measured voltage connected.	Connect measured voltage.
Voltage is too high (Red LED flashes)	Measuring range exceeded.	Check connection and correct if necessary and use a voltage transformer.
	Voltage transformer programmed incorrectly.	Read and program the voltage transformer ratio on the voltage transformer.
Measuring device switches off connected modules (module LEDs are off)	The self-resetting fuse of the measuring device has tripped and switched off a series of modules (short circuit or overload).	· Disconnect the measuring device from the power supply and allow to cool down (approx. 15 min.), observing the safety instructions. · Check/replace bus connector installation (eliminate short circuit) or reduce number of modules (overload).
Despite the above measures the device does not function.	Device defective.	Send the device and error description to the manufacturer for inspection.

UK Represented by:
Authorised Rep Compliance Ltd., ARC House, Thurnham,
Lancaster, LA2 0DT, UK.

Janitza[®]