www.janitza.com

Multifunction module 800-MF8

Expansion module for basic devices of the 800 series

User manual and technical data



Doc. no. 2.053.311.1.b 10/2026

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

Janitza



Suitable basic devices and number of module slots:

Suitable basic devices / Number of free slots	Slot assignment for an 800-MF8 module on the basic device
UMG 801 (as of FW 1.8.0) / 12 slots + 1 slot for an additional 800-DI14 module	1 slot
UMG 800 (as of firmware 1.8.0) / 12 slots + 1 slot for an additional 800-DI14 module	1 slot
Further information on module slot combinations and JanBus system limits can be found in the respective user manual for the basic device.	

Tab. Suitable basic devices

Multifunction module 800-MF8

(Suitable for basic devices of the 800 series)

Doc. no.: 2.053.311.1.b
Date: 10/2026
The German version is the original edition of the documentation.

Subject to technical changes.

The contents of our documentation have been compiled with great care and reflect the current state of the information available to us. Nonetheless, we wish to point out that updates of this document are not always possible at the same time as technical refinements are implemented in our products. Please see our website under www.janitza.com for the current version.
Please see our website under www.janitza.com for the current version.

Information about the GridVis software

Janipedia: wiki.janitza.de

Tutorials: youtube.com/@gridvis

TABLE OF CONTENTS

1. Information on the devices and the user manual 8

1.1 Disclaimer 8
1.2 Copyright notice 8
1.3 Technical changes 8
1.4 About this user manual 8
1.5 Defective device/disposal 9

2. Safety 10

2.1 Display of warning notices and safety instructions 10
2.2 Hazard levels 10
2.3 Product safety 10
2.4 Hazards when handling the device, components and modules 11
2.5 Electrically qualified personnel 12
2.6 Warranty in the event of damage 12
2.7 Safety instructions for handling current transformers 12
2.8 Safety instructions for handling measurement devices with residual current measurement 13

3. Product description 14

3.1 Multifunction module 800-MF8 14
3.2 Incoming goods inspection 15
3.3 Intended use 15
3.4 Overview of module functions 15
3.5 EU conformity declaration 16
3.6 FCC Declaration of Conformity 16
3.7 Transformers 16
3.8 Scope of delivery 16
3.9 Operating concept 17
3.10 GridVis network analysis software 17
3.11 Measurement device homepage 17

4. Mounting 18

4.1 Mounting module 18
4.2 Checking the module's communication 21
4.3 Faulty module communication 21

5. Connections/controls 22

6. Module markings – nameplate 23

7. Installation 24

7.1 Terminal assignment - schematic diagrams 25
7.1.1 Terminal 1 - connections 1-4 25
7.1.2 Terminal 2 - connections 5-8 25
7.2 Low-power current measurement 26
7.3 Temperature measurement 26
7.4 Analog measurement 26
7.5 Residual current measurement 27
7.5.2 Current direction of the residual current transformers 28
7.5.1 Residual current transformer example 28
7.5.3 Connection examples - Residual current measurement 29
7.5.4 Residual current detection - limit value calculation 30
7.5.5 Static limit value calculation 30
7.5.6 Dynamic limit value calculation 31
7.5.7 Stepwise (gradual) threshold calculation 32
7.5.8 Example: Residual current limit value exceeded 33
7.6 Module identification / Diagnostics on the basic device 34
7.6.1 Identifying all modules 34
7.6.2 Identifying one module 35
7.6.3 Module identification - LED blink interval 35

8. Module communication / PC connection 36

8.1 Module communication 36
8.2 PC connection of the basic device to the module 36
8.2.1 Connection to a DHCP server and PC 36
8.2.2 Direct PC connection to the basic device with module or your module series via the Ethernet interface 36
8.3 Module communication options 37
8.3.1 Module handling in the GridVis software 37
8.3.2 Basic device homepage 37

9. Operation, display and button functions 38

9.1 Operation and button functions of the basic device with module 800-MF8 38
9.2 Module-relevant menu items of the UMG 801 basic device with 800-MF8 modules 38

10. Module-relevant configurations 42

10.1 LP current transformer configuration on the basic device 42
10.2 Configuring the multifunction channels using the measurement device homepage 43
10.2.1 Configuring LP current measurement using measurement device homepage 44
10.2.2 Configuring analog measurement using the measurement device homepage 44
10.2.3 Configuring temperature measurement using the measurement device homepage 44
10.2.4 Residual current measurement using the measurement device homepage 44
10.3 Multifunction channel configuration in the GridVis software 45

11. Module-relevant measuring displays 46

12. Device views 53

13. Technical data 54

13.1 Technical specifications 54
13.2 Performance characteristics of functions 56

14. Dismounting 57

15. Module exchange/error cases 58

15.1 Module replacement 58
15.2 Modules - Error cases 59

16. Service and maintenance 60

16.1 Repair 60
16.2 Service 60
16.3 Device adjustment 60
16.4 Calibration interval 60
16.5 Firmware update 60
16.6 Procedure in the event of a malfunction 60
16.7 Reset to factory settings 60
16.8 Information on saving measured values and configuration data 61

1. Information on the devices and the user manual

1.1 Disclaimer

Compliance with the usage information for the devices (modules/components) 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 the usage information for the products is legible and accessible.

1.2 Copyright notice

© 2026 - Janitza electronics GmbH - Lahnau.
All rights reserved.

Any reproduction, processing, distribution or other use of this usage information, in whole or in part, is prohibited.

All trademarks and the rights arising from them are the property of the respective owners of these rights.

1.3 Technical changes

- Make sure that your device (modules/components) matches the user manual.
- This user manual applies to the 800-MF8 module. Separate validities and distinctions are marked.
- First make sure you have read and understood the usage information accompanying the product.
- Keep the usage information associated with the product available for the entire service life and pass it on to any possible subsequent users.
- Find out about device revisions and the associated modifications of the usage information associated with your product at www.janitza.com.

1.4 About this user manual

If you have questions, suggestions or ideas for improvement of the user manual, please let us know via email at: info@janitza.com.

INFORMATION

This user manual describes the 800-MF8 module for use with a compatible basic device (see "Tab. Suitable basic devices" on p. 2) and provides information about operating the devices and modules.

Also consult the additional usage information relevant for this user manual, such as:
- the installation manual.
- the data sheet.
- the "Safety instructions" supplement.
- the supplement on mounting the modules.
- the usage information on the basic device and the integrated modules of your meter and module topology.

Furthermore, the **GridVis software** has an "online help" feature.

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.

1.5 Defective device/disposal

Before sending **defective devices, modules or components** back to the manufacturer for testing:
· Contact the manufacturer's Support department.
· Send devices, modules or components complete with all accessories.
· When doing so, please bear the terms for transportation in mind.

INFORMATION

Please return defective or damaged devices, modules or components to Janitza electronics GmbH in accordance with the shipping instructions for air or road freight (complete with accessories).
Observe special regulations for devices with built-in batteries or rechargeable batteries!

Do not attempt to open or repair the device (the module, the component) on your own because otherwise all warranty claims become invalid!

For the **disposal** of the device (the module, the component), please observe national regulations! Dispose of individual parts, as applicable, depending on their composition and existing country-specific regulations, for example, as

· Electronic waste,
· Batteries and rechargeable batteries,
· Plastics,
· Metals.

Engage a certified disposal company to handle scrapping as needed.

Information on "Service and maintenance" of your device can be found in Sect. "16. Service and maintenance" on p. 60.

2. Safety

The chapter on Safety contains information which must be observed to ensure your personal safety and avoid material damage.

2.1 Display of warning notices and safety instructions

The warning notices shown below
· are found throughout the usage information.
· can be found on the devices themselves.
· indicate potential risks and hazards,
· underscore aspects of the information provided that clarifies or simplifies procedures.



This additional symbol on the device (module/component) itself indicates an electrical hazard that can lead to severe injury 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.



2.2 Hazard levels

Warning and safety instructions are marked by a warning symbol, and the hazard levels are shown as follows, depending on the degree of hazard:

⚠ 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.

INFORMATION

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

2.3 Product safety

The devices, components and modules reflect current engineering practice and accepted safety standards, but hazards can arise nonetheless.

Observe the safety regulations and warning notices. If notices are disregarded, this can lead to personal injury and/or damage to the product.

Every type of tampering with or use of the devices and the modules,
· which goes beyond the mechanical, electrical or other operating limits can lead to personal injury and/or damage to the product;
· constitutes "misuse" and/or "negligence" under the product's warranty and thus voids the warranty for any possible resulting damage.

Read and understand the user manual and the usage information on the basic device before installing, operating, maintaining and using the devices, components and modules.

Only operate the devices, components and modules when they are in perfect condition and in compliance with this user manual and the usage information that is included. Send defective devices, components or modules back to the manufacturer in compliance with proper transport conditions.
Retain the user manual throughout the service life of your product and keep it at hand for consultation.

When using the device, component or module, also observe the legal and safety regulations for your system that are applicable for the respective use case.

2.4 Hazards when handling the device, components and modules

When operating electric devices, components or modules, 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.

Therefore, when handling our devices, components, or modules, always observe the following:

· Do not exceed the limit values specified in the user manual and on the nameplate! This must also be observed during testing and commissioning!
· Take note of the safety and warning notices in all usage information that belongs to the device, components or modules!

⚠ WARNING

Disregarding the connection conditions of the Janitza measurement devices, modules or components can lead to injuries or even death or to material damage!

· Do not use Janitza meters, modules or components for critical switching, control or protection applications where the safety of persons and property depends on this function.
· Do not carry out switching operations with the Janitza measurement devices, modules or components without prior inspection by your system manager with specialist knowledge! In particular, the safety of persons, material assets and the applicable standards must be taken into account!

⚠ WARNING

Risk of injury due to electrical current and voltage! Severe bodily injury or death can result! Therefore please abide by the following:

· **Do not touch bare, stripped wires or device inputs that are dangerous to touch on the devices, components and modules.**
· **Switch off your installation before commencing work! Secure it against being switched on again! Check to be sure it is de-energized! Ground and short circuit! Cover or block off adjacent live parts!**
· **During operation and troubleshooting (especially with DIN rail devices), check the environment for dangerous voltages and switch these off if necessary!**
· **Wear protective clothing and protective equipment in accordance with applicable directives when working on electrical systems!**
· **Before making connections, ground the device / component / module by means of the ground wire connection, if present!**
· **Do not touching bare or stripped leads that are energized! Equip stranded conductors with wire ferrules!**
· **Hazardous voltages can be present in all circuitry parts that are connected to the power supply.**
· **Protect wires, cables and devices with a suitable line circuit breaker/fuse!**
· **Never switch off, remove or tamper with safety devices!**
· **There can still be hazardous voltages present in the device or in the component (module) even after it has been disconnected from the supply voltage (capacitor storage).**
· **Only connect screw terminals with the same number of poles and design!**
· **Do not exceed the thresholds specified in the user manual and on the nameplate! This must also be observed during testing and commissioning.**
· **Take note of the safety and warning notices in the usage information that belongs to the device, components or modules!**

2.5 Electrically qualified personnel

To avoid bodily injury and material damage, only electrically qualified personnel are permitted to work on the devices and their components, modules, assemblies, systems and current circuits who have knowledge of:

- The national and international accident prevention regulations.
- Safety technology standards.
- Installation, commissioning, operation, disconnection, grounding and marking of electrical equipment.
- The requirements concerning personal protective equipment.

Electrically qualified persons within the scope of the technical safety information of all usage information associated with the device and its components (modules) are persons who can furnish proof of qualification as an electrically skilled person.

⚠ WARNING

Warning against unauthorized manipulation or improper use of the device or its components (modules)!
Opening, dismantling or unauthorized manipulation of the device and its components (modules) which goes beyond the mechanical, electrical or other operating limits indicated can lead to material damage or injury, up to and including death.

- **Only electrically qualified personnel are permitted to work on the devices and their components (modules), assemblies, systems and current circuits.**
- **Always use your devices or components (modules) only in the manner described in the associated usage information.**
- **If there is discernible damage, send the device or the component (module) back to the manufacturer!**

2.6 Warranty in the event of damage

Any unauthorized tampering with or use of the device, component or module constitutes "misuse" and/or "negligence" under the product's warranty and thus voids the warranty for any possible resulting damage. Note in this regard Sect. "3.3 Intended use" on p. 15.

2.7 Safety instructions for handling current transformers

The field of transformer technology groups the totality of all devices that perform the function of a current, voltage or measuring transformer together as **sensors**.

In the usage information for our devices, modules and components, the terms **current transformer, voltage transformer or transformer** all refer to **sensors**.

A further distinction is drawn between the terms **current transformer (CT)** and **low-power current transformer (LP-CT** :
The term "current transformer" is used for special transformers for the primary-proportional conversion of currents of large magnitudes to directly measurable, smaller current values.
In contrast, the term "LP current transformer" (low-power current transformer) is used for special transformers for the primary-proportional conversion of currents of large magnitudes to directly measurable, smaller voltage values (low power).

Current transformers and **LP current transformers** provide safe galvanic isolation between the primary circuit and the measurement circuit due to their design and their physical operating principle.
For Janitza measurement devices, modules and components, use only **"transformers for measuring purposes"** which are suitable for the energy monitoring of your system! Observe the corresponding warning notices!

Basic devices use only the term **"current transformer"** in the display for the configuration of both **current transformers** and **LP current transformers**.

⚠ CAUTION

Risk of injury or damage to the meter due to high measured currents/measured voltages at the connections of the current transformers!
High measurement currents can cause temperatures of up to 80 °C (176 °F) on the connections of the current transformers
- **Use wiring that is designed for an operating temperature of at least 80 °C (176 °F)!**
- **Only use current transformers with basic insulation in accordance with IEC 61010-1!**
- **Make sure that screw terminals for the current transformer connection on the device are adequately tightened!**
- **Comply with the information and provisions in the documentation of your current transformers!**
- **Ground connections present on the secondary windings of the current transformers must be connected to ground!**
- **The current transformers can be hot even after the power supply has been switched off. Allow the connections of the current transformers and the connecting cables to cool down before touching them!**

⚠ CAUTION

Risk of injury or damage to the basic device (module) and/or your system due to a short circuit!
Inadequate insulation at the current measurement inputs of the modules with respect to the supply circuits of the basic device can cause dangerous voltages at the measurement input or damage to your device (module)/system.
- **Ensure reinforced or double insulation with respect to the supply circuits!**

2.8 Safety instructions for handling measurement devices with residual current measurement

⚠ WARNING

Risk of injury or damage to the meter due to improper use!
Meters with residual current measurement can trigger warning pulses if limit values are exceeded, and these are used exclusively for monitoring residual currents or failure monitoring. Use of the warning pulses as a stand-alone protective device against electrical shock can lead to injury and even death!
- **Do not use devices with residual current measurement as a stand-alone protective device. Employ suitable protective devices for your system!**

⚠ CAUTION

Risk of injury or damage to the meter/your system due to short circuit!
Inadequate insulation of the operating equipment at the residual current measurement input with respect to the supply circuits can cause voltages at the measurement input which represent a hazard when touched or damage to your device or system.
- **Ensure reinforced or double insulation with respect to the supply circuits!**
- **Ensure galvanic isolation of the residual current measurement inputs from each other!**

3. Product description

3.1 Multifunction module 800-MF8

The multifunction module
- is suitable for basic devices of the 800 series (see "Tab. Suitable basic devices" on p. 2).
- extends the functional range of the basic device to include additional current measurement channels (2 groups of 4 current measurement channels each);
- is suitable for low-power current transformers with a secondary voltage of 0 .. 400 mV.
- is suitable for residual current transformers with a secondary current of 0 .. 40 mA
- is suitable for analog sensors with an output signal of 0 to ... 20 mA
- is suitable for temperature sensors ("13.1 Technical specifications" on page 54)

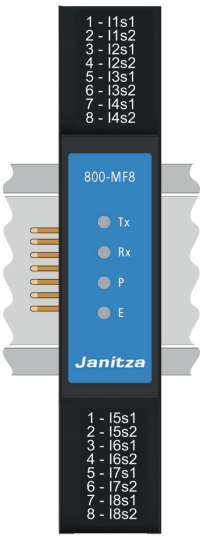


Fig.: Module 800-MF8 (view without terminals)

The basic device (see "Tab. Suitable basic devices" on p. 2) with a module measures current exclusively using low-power current transformers. The LP current transformers require double insulation in accordance with IEC 61010-1 for the current circuit's rated voltage.

Please refer to the definition of the terms "current sensors", "current transformers" and "low-power current transformers" on Page 12 in this user manual!

⚠ WARNING

Damage to the device/module or your installation even including life-threatening injuries due to a short circuit.
Insufficient insulation of the equipment (LP current transformers) at the current measurement inputs with respect to the circuits can lead to life-threatening voltages or damage to your device, module or system.
- **Observe the information and specifications for your LP current transformer concerning insulation and ensure end-to-end double insulation of your LP current transformers to mains and measuring circuits!**

INFORMATION

When setting up your meter and module topology, note the following:
- Do not exceed the permitted number of modules on a basic device (see usage information for the basic device and "Tab. Suitable basic devices" on p. 2).
- Check that the scope of delivery of the module includes the appropriate bus connector (JanBus interface) for connection to the basic device.
- In addition to the module, also read and understand the usage information for your basic device and the LP current transformers!
- Do not extend the connecting cables of the LP current transformers at the current measurement inputs of the device/module! Extended measuring leads can influence the measurement result!
- Do not exceed the maximum bus length of the JanBus (see Sect. "13. Technical data" on p. 54)!

3.2 Incoming goods inspection

The prerequisites for trouble-free and safe operation of the module 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 the following:
· the module by performing a visual inspection to ensure flawless mechanical condition.
· the scope of delivery (see Sect. "3.8 Scope of delivery" on p. 16) for completeness before beginning with assembly and installation.

If it must be assumed that safe operation of your basic device with module is not possible:
1. **Switch off the power to your system (your device)!**
2. **Secure it against being switched back on!**
3. **Check to be sure it is de-energized!**
4. **Ground and short circuit the system (device)!**
5. **Cover or block off adjacent live parts!**

Safe operation is impossible, if, for example, the basic device with module:
· 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 conditions without adaptation to the room climate, condensation, etc.) or transport stress (e.g. falling from an elevated position, even without visible external damage, etc.).

ATTENTION

Improper handling may cause damage to the module and result in material damage!
The contacts of the bus connectors (Janbus interface) can bend or break off and destroy the bus connector.
· Never touch or manipulate the contacts of the bus connector!
· Never force the bus connector into the module! Please note **Sect. "4. Mounting" on p. 18 in this regard.**
· **When handling, transporting and storing the module, protect the contacts of the bus connector!**

3.3 Intended use

The module / component
· is only for use in the industrial sector.
· is intended as an expansion module for a basic device (see "Tab. Suitable basic devices" on p. 2) in switchboard cabinets and small distribution boards.
· is intended for indoor use in a weather-protected, fixed location.
· must only be mounted with a basic device that is disconnected from the power supply (see "4. Mounting" on page 18).

INFORMATION

More information on certain functions of the basic device with modules can be found in the usage information of the basic device.

The basic device and the modules are not designed for installation
· In vehicles! Use of the basic device with modules in non-stationary equipment is considered an exceptional environmental condition and is only permissible by special agreement.
· In environments with harmful oils, acids, gases, vapors, dusts, radiation, etc.
· In potentially explosive environments.
· In critical switching, control, or protection applications (e.g., not for outputting safety-related signals).

3.4 Overview of module functions

Functions of the 800-MF8 module:
· 8 multifunction inputs (operating current, residual current, analog sensors, temperature measurement).
· Measuring category 300 V CAT II.
· Nominal input signal 0 .. 400 mV, 0 .. 40 mA (RCM) or 0 .. 20 mA (analog input), configurable.
· Occupies 1 slot (module slot) of a basic device.

3.5 EU conformity declaration

Information on the laws, standards, and directives applied by Janitza electronics GmbH for the devices, can be found in the EU Declarations of Conformity at www.janitza.com. The EU conformity of the device permits CE marking.

3.6 FCC Declaration of Conformity

The device:
- complies with Part 15 of the FCC Rules for Class B digital devices (limit values to protect against harmful interference in a residential installation).
- generates, uses and can radiate high-frequency energy
- can cause harmful interference to radio communications if not installed and used properly. There is no guarantee that interference will not occur in a particular installation.

If there is radio or television reception interference, which can be determined by turning the device on and off, proceed as follows:
- Align or reposition the receiving antenna.
- Increase the distance between the device and the radio/television receiver.
- Connect the device and the radio/television receiver in different current circuits.
- if necessary, contact Janitza support or a radio/television technician.

Code of Federal Regulations, Title 47, Part 15, Subpart B - Unintentional Radiators.

3.7 Transformers

It is not permitted to use the outputs of Janitza measurement devices, components and modules for switching protective devices or protective relays! Use only "Current transformers for measuring purposes" for Janitza measurement devices, components and modules!

3.8 Scope of delivery

Quantity	Part. no.	Designation
1	52312xx	Module 800-MF8 (multifunction module)
1	5238251	Accessory pack
1	3303918	Installation manual (DE/EN)
1	3303342	"Safety instructions" supplement

Table: Scope of delivery for Module 800-MF8

INFORMATION

- The modules are supplied with the necessary connection terminals and bus connectors (JanBus interface) for connection to a basic device or other modules (accessory pack).
- Please refer to the delivery note for all options and design variants supplied.
- The GridVis power system analysis software is available at www.janitza.com and can be used to configure the basic device with modules and read out data for analysis (prerequisite: PC connection to the basic device).

3.9 Operating concept

Options for configuring the basic device with a module or reading measured values:
· Display and buttons on the basic device
· GridVis network analysis software
· RS-485 interface or Ethernet interface
· Measurement device homepage

The modules can be used to realize meter and module topologies with a flexible arrangement of the DIN rails. For the operation of the devices, components and modules integrated in your meter and module topology, please refer to the respective additional usage information.

INFORMATION

This user manual describes modules and provides information on operating the modules via a basic device.

Please refer to the user manual for the basic device for information on operating, configuring and reading out expansion modules.

The GridVis software includes an online help feature with tutorials.

A list of parameters and Modbus addresses with data on your basic device with module is available as a download at www.janitza.com.

3.10 GridVis network analysis software

The GridVis software allows you to read out and configure devices as well as visualize measurement data. GridVis is available for download at www.janitza.com.

GridVis software performance characteristics
· Configuration of the basic device and the modules of your meter and module topology.
· Graphic display of measured values.
· Online help and tutorials.

Connections to the PC (GridVis software)
Information on connections for communication between the PC and the basic device (with modules) can be found in the usage information for the basic device.

3.11 Measurement device homepage

You can configure the module and view current measured values on the basic device's measurement device homepage. To open the measurement device homepage, enter the IP address of the basic device in your web browser.

4. Mounting

4.1 Mounting module

⚠ CAUTION

Property damage or personal injury due to disregard of the assembly instructions!
Disregard of the assembly 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 and warning information.**
- **Before installing modules**
  - **Disconnect the supply of power to the system!**
  - **Secure it against being switched on again!**
  - **Check to be sure it is de-energized!**
  - **Ground and short circuit!**
  - **Cover or block off adjacent live parts!**
- **Operate the basic device that belongs to the 800-MF8 module exclusively with a supply voltage of 24 V! Observe the technical specifications in the usage information for the basic device.**
- **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 available for download at www.janitza.com.**

ⓘ *INFORMATION*

System limits:

- The maximum bus length (JanBus) for the setup of measurement device and module topologies can be found in the "Technical data".
- If necessary, observe the installation manual for transfer modules when setting up decentralized measuring concepts.
- Before mounting, please check the number of suitable modules for your measurement device and module topology based on the respective usage information.
- When installing the device/module, ensure that there is sufficient space in the installation environment. Please also note the size of the connection terminals used!

The scope of delivery of the 800-MF8 module can be found in Sect. "3.8 Scope of delivery" on p. 16. More information on certain functions of the basic device with modules can be found in the usage information of the basic device.

Following the assembly instructions for your basic device (including checking the bus connector installation!), install the 800-MF8 module with the system de-energized as follows:

1. Press in the open bottom bolts on the rear of the module.

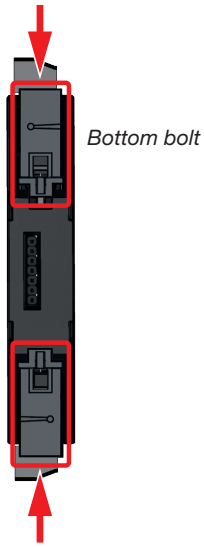


Fig.: Module rear view

ⓘ *INFORMATION*

- The following module assembly sequence must be observed!
- The illustrations may differ depending on the connection terminals used!

2. If this has not yet been done, press the bus connector (JanBus interface) included in the scope of delivery into the sockets on the rear of your module.

ATTENTION

Improper handling may cause damage to the module and result in material damage!
The contacts of the bus connectors (JanBus interface) can bend or break off and destroy the bus connector.
- **Never touch or manipulate the contacts of the bus connector!**
- **Never force the bus connector into the module!**
- **When handling, transporting and storing the module, protect the contacts of the bus connector!**

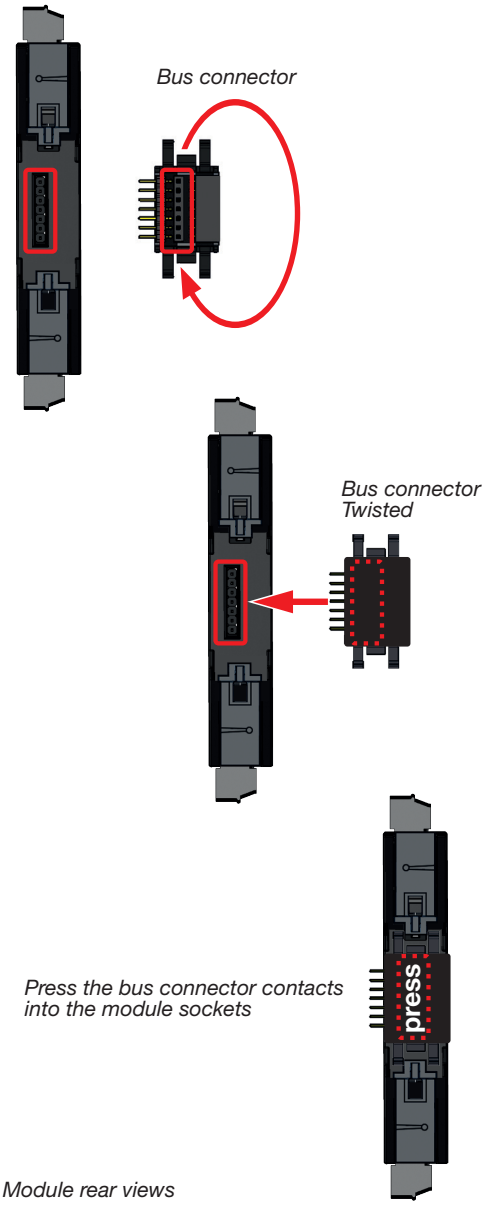


Fig.: Module rear views

3. Press the module with the bus connector onto the DIN rail (for suitable DIN rail types, see Sect. "13. Technical data" on p. 54) until the bottom bolts engage (click).

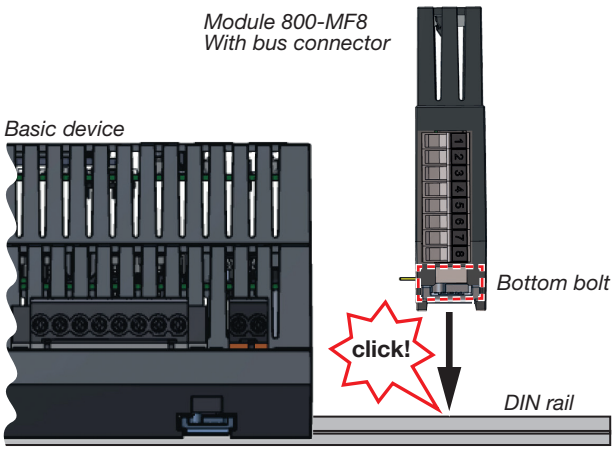


Fig.: Side view of basic device and 800-MF8 module

4. To couple the bus connectors (devices), push the contacts of your module bus connector into the sockets of the basic device bus connector (or into the sockets of the connected module).

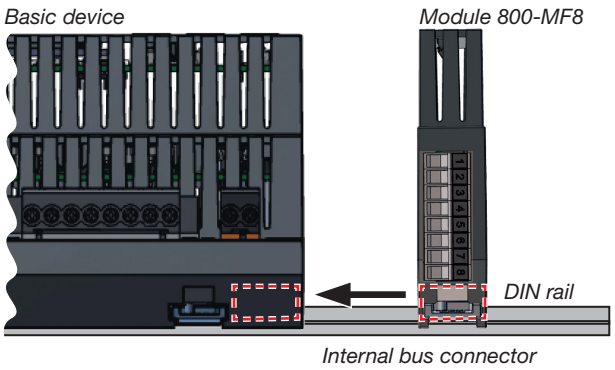


Fig.: Side view of basic device and 800-MF8 module



Fig.: Front view of the basic device; shown here is a UMG 801 with a coupled 800-MF8 module (mounting example – view without terminals)

5. After successfully coupling the bus connectors (of the devices), mount end brackets to the series of meters and modules.
6. Wire the module and apply power to the basic device (your system).
   The basic device automatically recognizes the module during the power-up procedure!

INFORMATION

Please note the structure and dimensioning of the measurement device and module topology:
- A type 800-MF8 module has 8 multifunction channels.
- Current is measured using low-power current transformers (../0-400 mV) and RCM current transformers (0-40 mA).
- Temperature is measured using temperature sensors (see Sect. "13. Technical data" on p. 54).
- If the measurement devices and modules are located in separate areas, observe the maximum JanBus bus length.
  Information on cable lengths can be found in the usage information for the transfer modules.
- Use end brackets to mount the measurement device and module series on the DIN rail.

4.2 Checking the module's communication

After installing your module, check the function of the communication between the basic device and the module using the display on the basic device (e.g. a UMG 801) as follows:

1. When you are in the *Home* measuring display of the basic device, pressing the button 1 *ESC* takes you to the *Menu* window.
2. Use buttons 2 (▲) and 5 (▼) to select the menu item *System information* and confirm with button 3 *Enter*.
3. The *System information* window with the items *Basic device* and *Module 1* appears.

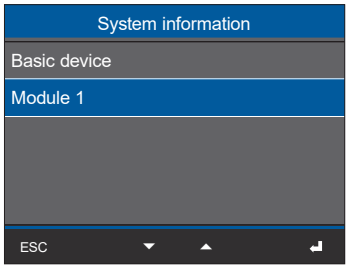


Fig.: System information window of a basic device with the entries "Basic device" and "Module 1".

The basic device has detected module 1.

4.3 Faulty module communication

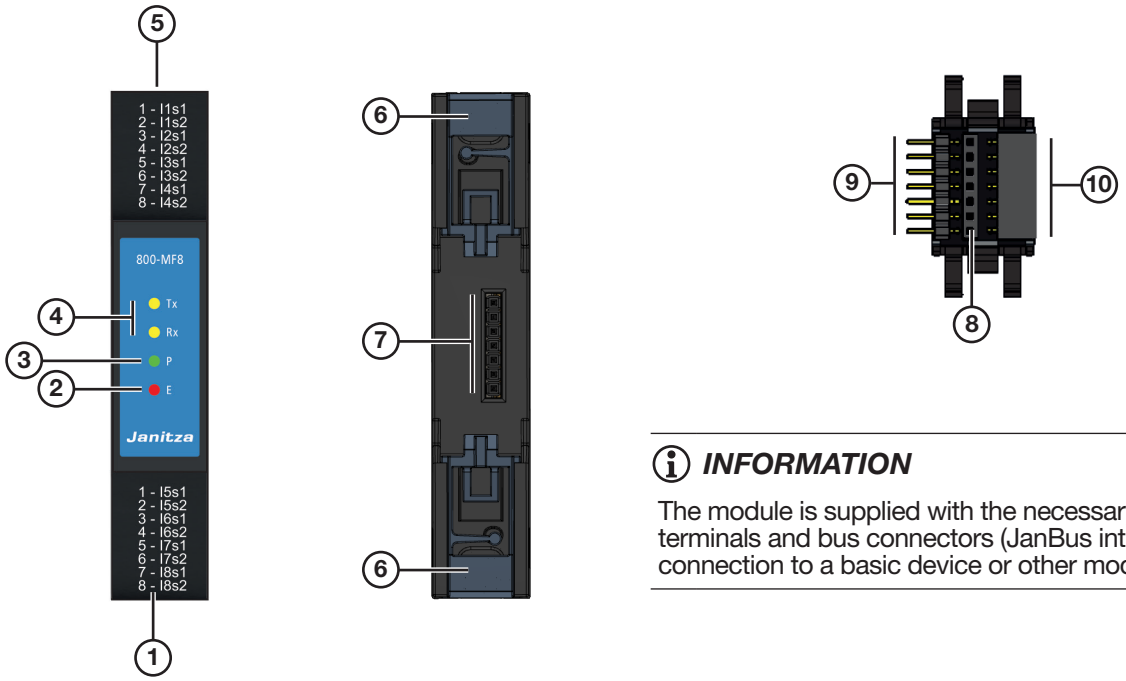
Error after starting the basic device with module:

INFORMATION

The basic device does not recognize modules during the power-up procedure!
If there is no communication to modules, the module functions are not supported (e.g. current measurements).

- **Disconnect your system from the power supply and check the condition of the bus connectors and the connections of your modules to the basic device (JanBus interface). If necessary, push the contacts of the module bus connectors into the sockets of the basic device bus connector or the attached modules so that the bus connectors (devices) are coupled.**
- **For remote module series, check the connection of the transfer modules.**
- **If necessary, restart the basic device.**
- **If these measures do not lead to the desired result, contact our Support – www.janitza.com**

5. Connections/controls



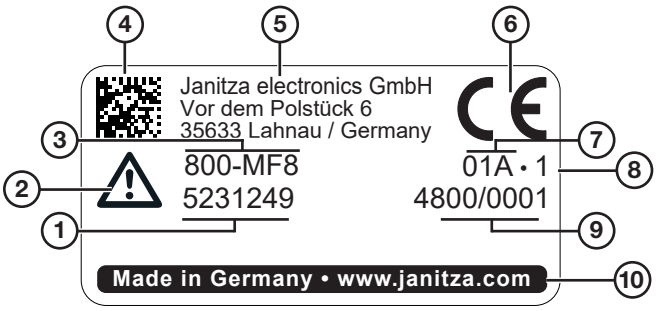
INFORMATION

The module is supplied with the necessary screw terminals and bus connectors (JanBus interface) for connection to a basic device or other modules.

Item	Designation	Description
1	4 multifunction channels, terminals 1-8	Multifunction channels I5, I6, I7, I8 (connection of LP current transformers, RCM current transformers, temperature and analog sensors).
2	LED	Lights up "red" at power-up and remains so until completion of initialization (module not yet initialized). Then there is a switchover to cyclic data exchange (pos. 4).
3	LED	Lights "green" when the power supply via the JanBus interface of the basic device is correct. The device is ready for operation.
4	2 LEDs	Blink "orange" during operation and indicate cyclic data exchange.
5	4 multifunction channels, terminals 1-8	Multifunction channels I1, I2, I3, I4 (connection of LP current transformers, RCM current transformers, temperature sensors, and analog sensors).
6	Bottom bolts	For mounting the module on the DIN rail.
7	JanBus interface	Connection contacts for the bus connector (item 8).
8	JanBus interface	Bus connector insert (sockets) into the module.
9	Bus connector contacts (JanBus)	Connection to a basic device (or connected modules).
10	Bus connector sockets (JanBus)	Connection of additional modules.

Tab. Connections/controls

6. Module markings – nameplate



Item	Designation	Description
1	Item number	Marking for traceability.
2	Symbol for "Danger sign"	General hazard symbol. Be certain to observe the warning notices applied to the device and shown in the documentation in order to avoid possible injury or even death.
3	Device type	Device designation
4	DataMatrix code	Coded manufacturer data
5	Manufacturer	Complete contact address of the manufacturer (company name, street, house number, postal code, city, country).
6	CE conformity marking	See Sect. "3.5 EU conformity declaration" on p. 16
7	Manufacturer-specific data	Manufacturer data
8	Hardware version	Hardware version of the module
9	Type/serial number	Number for identification of the device
10	Designation of origin/web address	Country of origin and manufacturer's web address

Tab. Identification of the module - nameplate

7. Installation

⚠ WARNING

Risk of injury due to high currents and high electrical voltages!
Severe bodily injury or death can result from:
· Touching bare or stripped leads that are energized.
· Inputs of devices, components and modules are dangerous to touch.
Therefore, please note for your system:
· **Disconnect the supply of power before starting work!**
· **Secure it against being switched on again!**
· **Check to be sure it is de-energized!**
· **Ground and short circuit! Use the ground connection points with the ground symbol for grounding!**
· **Cover or block off adjacent live parts!**

⚠ CAUTION

Risk of injury or damage to the device due to high measurement currents at the connections of the current transformers or the current measurement inputs of the device!
High measurement currents can cause temperatures of up to 80 °C (176 °F) on the connections of the current transformers
· **Use wiring that is designed for an operating temperature of at least 80 °C (176 °F)!**
· **The current transformers can be hot even after the power supply has been switched off. Allow the connections of the current transformers and the connecting cables to cool down before touching them!**
· **Make sure that screw terminals for the current transformer connection on the device are adequately tightened!**
· **Ground connections present on the secondary windings of the current transformers must be connected to ground!**
· **Observe the general safety instructions for handling current transformers in section Sect. "2.7 Safety instructions for handling current transformers" on p. 12.**
· **Comply with the information and provisions in the usage information of your current transformers!**

Your 800-MF8 module, when used in combination with a basic device, is suitable for low-power current measurement, residual current detection, temperature measurement, and analog measurement.

1. Connect the current transformers, temperature sensors, or analog sensors to the module's terminals.
   - Connect the current transformers using twisted-pair wires. Twisted-pair wires reduce electromagnetic interference and ensure reliable transmission of measurement signals.
   - Isolately connect the secondary sides of the power supplies (24 VDC) from active components - such as current transformers, analog sensors, or other current sources - from the power supply of the basic device. For each active component use a separate power supply with no ground reference to the basic device.
2. Configure the multifunction channels and connected current transformers and sensors via the measurement device display, the GridVis software, or the measurement device homepage of the basic device (see "10. Module-relevant configurations" on page 42).

⚠ CAUTION

Risk of injury or damage to the module or your system due to a short circuit!
Insufficient insulation of the operating equipment on the multifunction channels from the supply circuits can cause voltages at the measurement input which represent a hazard when touched or damage to your device or system.
· **Ensure reinforced or double insulation with respect to the supply circuits is used throughout!**
· **Isolate the measurement inputs from each other and from the supply voltage (24 V) galvanically!**

ATTENTION

Damage to the measurement device and/or your system due to a short circuit!
Inadequate insulation of the operating equipment (e.g. the temperature sensor) at the multifunction channels with respect to the supply circuits can cause damage to your measurement device and/or your system.

· **Ensure a reinforced or double insulation of your operating equipment with respect to the supply circuits!**
· **Use shielded cables to connect sensors!**
· **Do not exceed a total burden of 4 kΩ (sensor and cable)!**

7.1 Terminal assignment - schematic diagrams

INFORMATION

The device and module illustrations may vary depending on the basic device and connection terminals used!



Fig. Terminal assignment for module 800-MF8.

7.1.1 Terminal 1 - connections 1-4

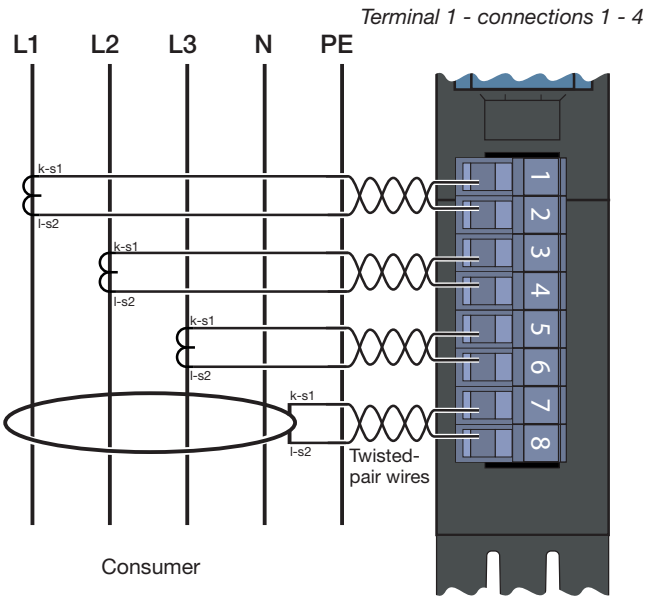


Fig. Connection example for LP current measurement (terminals 1-3) and residual current measurement (terminal 4).

7.1.2 Terminal 2 - connections 5-8

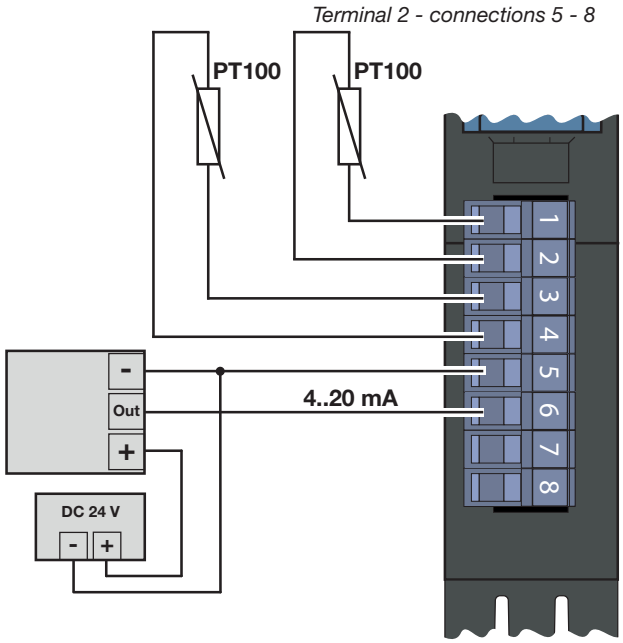


Fig. Connection example for temperature measurement (terminals 5 and 6) and analog measurement (terminal 7).

⚠ WARNING

Disregard of the connection conditions of the transformers to Janitza measurement devices or their components can lead to injuries or even death or to material damage!

- Do **not** use the outputs of the Janitza measurement devices or their components for switching protective devices or protective relays! **Do not** use **"transformers for protection purposes"**!
- For Janitza measurement devices and their components use **only "Transformers for measurement purposes"** which are suitable for the energy monitoring of your system.
- Observe the information, regulations and limit values in the usage information on **"Transformers for measuring purposes"**, including during testing and commissioning of the Janitza measurement device, the Janitza component and your system.

7.2 Low-power current measurement

Your 800-MF8 module in combination with a basic device:

- Measures current exclusively using low-power current transformers and small-signal current transformers.
- Allows the connection of LP current transformers with a secondary voltage of 0 .. 400 mV for the current measurement inputs I1 to I8.
- Has a default setting for the LP current transformer ratios of 5 A/333 mV (I1 to I8).
- Does not measure DC currents.

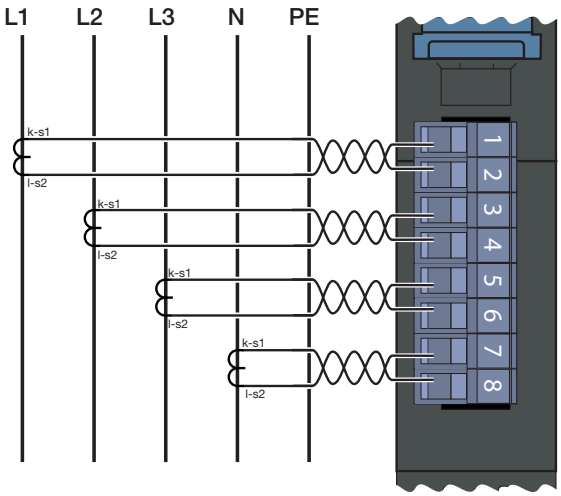


Fig. Connection example for "LP current measurement" using an LP current transformer.

You can correct the current direction for each phase individually via the serial interfaces provided. In the case of incorrect connection, no subsequent reconnection of the current transformers is necessary.

The ratios of the LP current transformers can be configured on the device display, using the GridVis software, or via the measurement device homepage of the basic device (see "10. Module-relevant configurations" on page 42).

7.3 Temperature measurement

Your 800-MF8 module, when used in combination with a basic device, measures temperatures via external temperature sensors (see Sect. "13. Technical data" on p. 54).

The measured values of the connections declared as temperature inputs are obtained by determining the average value from accumulated resistance values. The meter calculates the temperature value from the average value.

Connected temperature sensors can be configured in the GridVis software or via the measurement device homepage of the basic device (see"10. Module-relevant configurations" on page 42).

7.4 Analog measurement

When used in combination with a basic device, your 800-MF8 module measures analog milliampere signals from external sensors. These include, for example, humidity, fill-level, and torque sensors.

Information on the measurement signals can be found in Sect. "13. Technical data" on p. 54.

Connected sensors can be configured in the GridVis software or via the measurement device homepage of the basic device (see "10. Module-relevant configurations" on page 42).

7.5 Residual current measurement

Your 800-MF8 module in combination with a basic device:

- Measures residual currents exclusively using active and passive residual current transformers (RCM current transformers).
- Allows the connection of active residual current transformers with a secondary current of 0 .. 20 mA or 4 .. 20 mA.
- Allows the connection of passive residual current transformers with a secondary current of 0 .. 40 mA.

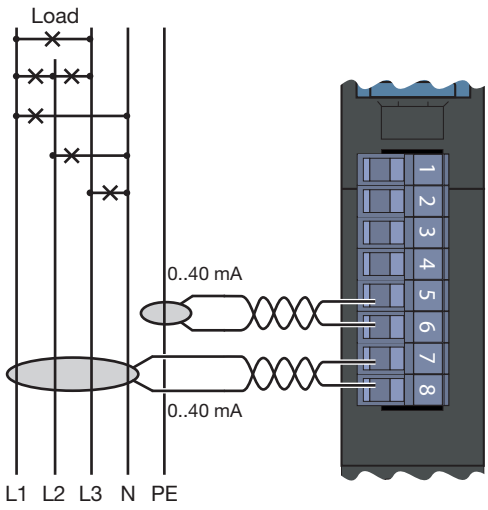


Fig. Connection example "Variant, residual current measurement" via current transformer (Type A).

The measurement device uses the module to measure residual currents in accordance with IEC/TR 60755 (2008-01) as of:

Type A

Type B and type B+
(via corresponding current transformers)

For residual current measurement, residual current transformers with a nominal current of [see section "13. Technical data" on page 54] are suitable.

ATTENTION

Faulty cross currents, incorrect measurements, and even damage to the device and/or your system due to lack of galvanic isolation!
A lack of galvanic isolation of active external current transformers (or other current sensors) on the multifunction channels from the supply voltage of the device can lead to faulty cross currents, incorrect measurements or even damage to your device and/or system.

- Do not take the auxiliary voltage supply of active external current transformers (or other current sensors) on the multifunction channels from the supply voltage of the device! For each active current transformer, use galvanically isolated power supplies (secondary side).
- Do not ground passive current transformers on the multifunction channels! Observe the usage information of the current transformer manufacturer.

Monitoring residual currents in an electrical system via the multifunction inputs of the modules allows an alarm management system to be set up with the GridVis software. This allows the system operator to be alerted before a protective device is triggered, for example.

Warning and alarm thresholds, as well as the ratios of the residual current transformers, can be configured in the GridVis software or via the measurement device homepage (see "10. Module-relevant configurations" on page 42).

INFORMATION

This module is not a standalone protective device against electric shock!

7.5.2 Current direction of the residual current transformers

For residual current measurement with current transformers in AC operation at the measurement inputs, the module does not distinguish between the current directions. Incorrect connection of the residual current transformers in AC operation does not require subsequent rewiring.

INFORMATION

AC operation:
The module does not distinguish between the current directions of the residual currents.
The residual currents of the grid side or load side are **not** directionally sensitive.
AC/DC operation:
Pay attention to the polarity when using current transformers in AC/DC operation!
See section "7.5.3 Connection examples - Residual current measurement" on page 29.

⚠ WARNING

Risk of injury due to large currents and high electrical voltage on the current transformers!
Current transformers operated while open on the secondary side (high voltage peaks pose a hazard when touched) can result in severe bodily injury or death.

- **Avoid operating the current transformers while open; short circuit the unloaded transformers!**
- **Before interrupting the current supply, short circuit the secondary connections of the current transformers. Switch any test switches that automatically short circuit the secondary lines of the current transformers to the "Test" status (Check the test switch/short circuiting connection beforehand)!**
- **Only use current transformers with basic insulation in accordance with IEC 61010-1!**
- **Caution, even current transformers rated as safe for open operation can pose a hazard when touched during operation while open!**
- **Make sure that screw terminals for the current transformer connection on the module are tightened sufficiently!**
- **Comply with the information and provisions in the documentation of your current transformers!**
- **Ground connections present on the secondary windings of the current transformers must be connected to ground!**
- **Observe the general safety instructions for handling current transformers and devices with residual current measurement.**

7.5.1 Residual current transformer example

Operating equipment must have reinforced or double insulation from supply circuits!

Example:
A residual current transformer is used to measure on insulated mains wiring in a 300 V CAT III network.
Solution:
Provide basic insulation for 300 V CAT III for the insulation of the network wiring and the insulation of the residual current transformer. This corresponds to a test voltage of 1500 V AC (1 min. duration) for the insulated network wiring and a test voltage of 1500 V AC (1 min. duration) for the residual current transformer.

7.5.3 Connection examples - Residual current measurement

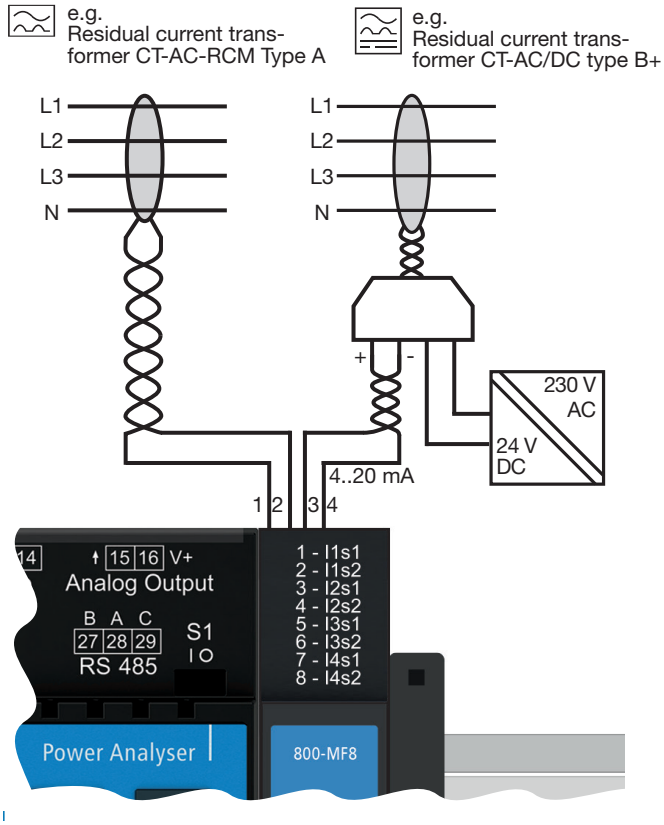


Fig. Connection variant, residual current measurement via current transformer Type A and Type B. (Power supply with U = 24 VDC, residual ripple < 5%, power = 24 W.

INFORMATION

Pay attention to the polarity when using type CT-AC/DC current transformers!

INFORMATION

Each residual current transformer in the CT-AC/DC Type B+ RCM series requires its own power supply.

Galvanically insulate the secondary sides of the power supplies (24 V DC) from each other!

7.5.4 Residual current detection - limit value calculation

To set and calculate residual current limit values, the module requires parameters that can be set in the GridVis software or via the measurement device homepage of the basic device (see "10. Module-relevant configurations" on page 42).

Three methods for calculating residual current limit values:

1. **Static limit value calculation**
   A constant limit value is defined. If this limit value is exceeded, a limit violation occurs.

2. **Dynamic threshold calculation**
   Depending on a reference value, the threshold for violations changes continuously, and with it, the respective warning.
   The respective threshold is calculated from the reference value multiplied by a multiplier, plus a static offset.

3. **Stepwise threshold calculation (gradual)**
   In dependence on a reference value, the threshold for violations changes stepwise and with it the respective warning. Limit values can be defined for up to 10 ascending thresholds of the reference value (power levels). The respective limit values are calculated based on the static limit value plus the limit value offset of the highest power level that the reference value exceeds.

7.5.5 Static limit value calculation

Required parameters:
· Static residual current limit value.
· Minimum time for which the residual current limit value is exceeded (RCM alarm).
· Warning before the static residual current limit value is reached (warning level in %).

Residual current limit value X warning level = warning limit value

Percentage value of the residual current limit value

Example graph
The following example graph explains the residual current measurement with a static limit value calculation:
· Residual current limit value: 300 mA.
· Warning level (in %)

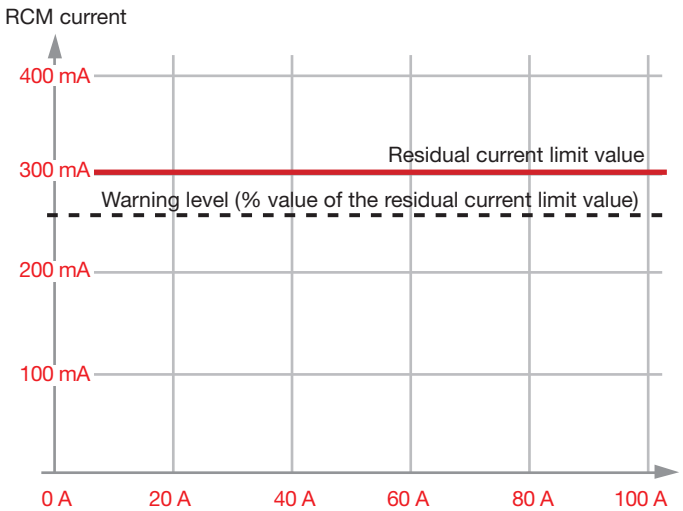


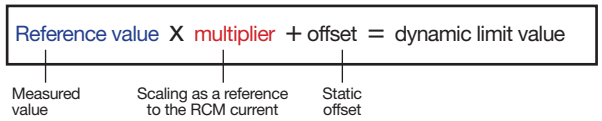
Fig. Example graph "Calculation of the static residual current limit value".

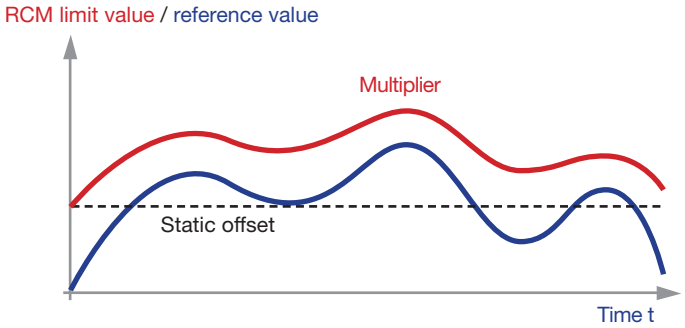
Explanation:
· The static limit value calculation (constant value) is active.
· If a **measured residual current** exceeds the warning level, the device displays a warning.
· If a **measured residual current** exceeds the residual current limit value, the device indicates an overcurrent violation.
· If the **measured residual current** exceeds the residual current threshold for longer than the **minimum exceedance time** (configurable in the GridVis software or on the measurement device homepage), the device triggers an alarm.

7.5.6 Dynamic limit value calculation

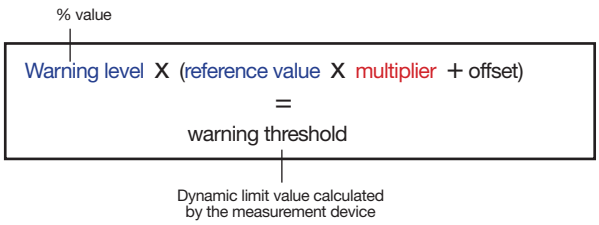
Required parameters:
· Minimum time for which the residual current limit value is exceeded (RCM alarm).
· Warning level (percentage value, warning before the limit value is reached).
· Reference value - measured value (selectable from the multifunction channels, the current channels of the basic device or the modules).
· Offset (static component) of the limit value.

Dynamic limit value
· Is a function of a reference value (measured value).
· Adjusts the limit value for violations dynamically.
The dynamic limit value is calculated from:





Warning limit value
The dynamic warning limit value is therefore calculated using the following formula:



Example graph
The example graph for the dynamic limit value shows the relationship between the residual current limit value and the reference value (e.g. "Power") with the following settings:
· Reference value: Power in kW
· Scaling (multiplier): 10 mA / kW
· Offset for residual current measurement: 20 mA

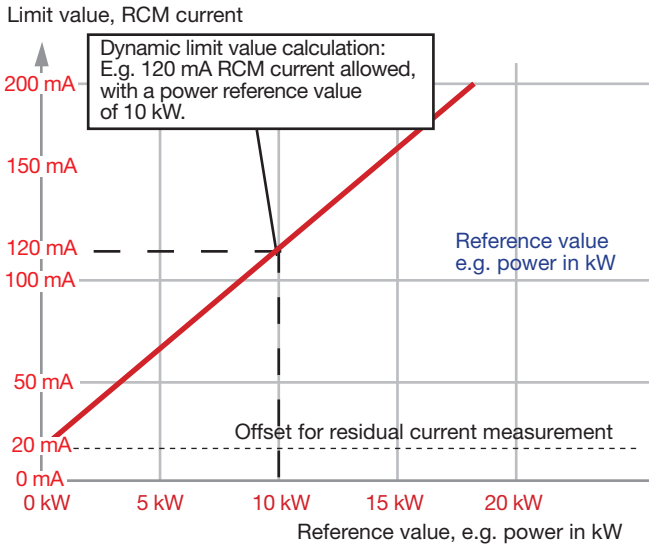


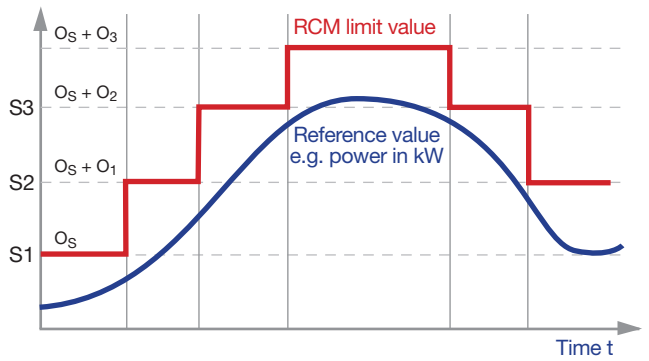
Fig. Example graph, "Calculation of the dynamic residual current limit value".

7.5.7 Stepwise (gradual) threshold calculation

Required parameters:
· Reference value (e.g. power in kW).
· Minimum time for which the residual current limit value is exceeded (RCM alarm).
· Warning level (percentage value, warning before the limit value is reached).
· Residual current limit values for the respective power levels (steps).
· Offset (static component) of the limit value.

Stepwise limit value
· Is a function of a reference value.
· Adjusts the residual current limit value stepwise in accordance with the power levels and the associated limit value offsets.
· Is calculated from a static offset and the respective limit value offset (the highest threshold value exceeded by the reference value).
· If no power level is configured, the static offset applies.

RCM limit value / reference value



Abbreviation	Description
S1, S2, S3	Thresholds of the stepwise residual current limit values
O_S	Static offset
O_1, O_2, O_3	Limit value offsets assigned to the residual current thresholds

Example graph
The example graph shows the stepwise increase of the residual current limit values as a function of the reference value "power" (of the system) with the following power levels (steps):
· Reference value: Power in kW.
· Variable residual current limit value per power level.

Limit value, RCM current

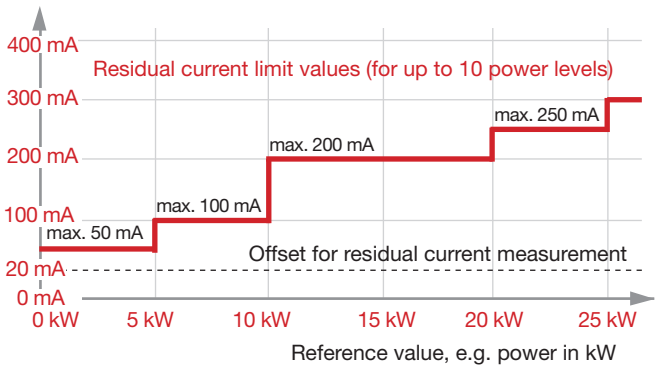
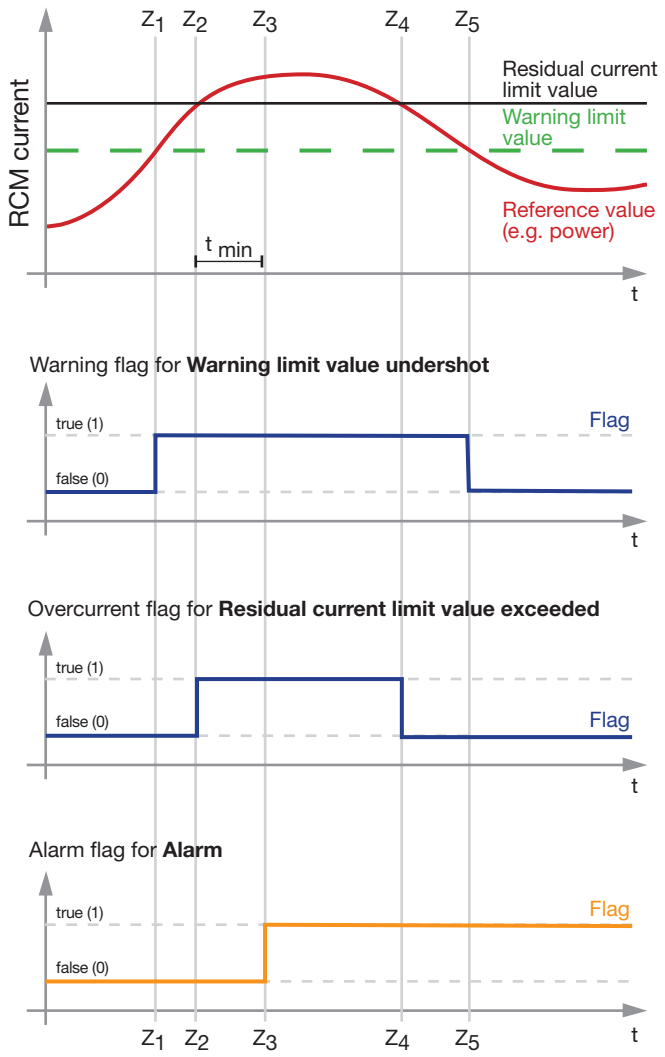


Fig. Example graph, "Calculation of the stepwise residual current limit value"

INFORMATION

This limit value calculation allows a non-linear configuration of the levels. These nonlinear steps make it possible, for example, to configure a lower limit value when reference values are higher. This allows machines that have a comparatively low residual current with high power to be configured optimally, for example.

7.5.8 Example: Residual current limit value exceeded



t_{min} ... minimum time exceeded

The adjacent graphs explain the 3 events **Warning limit exceeded**, **Residual current limit value exceeded** and **Alarm flag** with the states:

- Warning limit value exceeded at time instant Z_1: Warning flag =1.
- Residual current limit value undershot at time instant Z_2: Overcurrent flag =1.
- Residual current limit value exceeded beyond the **minimum duration of exceedance t_{min}** at time instant Z_3: Alarm flag = 1.
- Residual current limit value undershot at time Z_4: Overcurrent flag = 0.
- Warning limit value undershot at time Z_5: Warning flag = 0.
- The alarm flag remains set until manual acknowledgment.

INFORMATION

The device has an alarm lead time which is used to ensure that the device does **not** trigger an alarm in the case of minor (short) violations of the residual current limit value.

7.6 Module identification / Diagnostics on the basic device

INFORMATION

Before you start the module identification function (*Diagnostics* menu item) on the basic device, please make sure that the modules are mounted and connected correctly. Only modules that are properly installed and connected to the basic device can guarantee power supply and data transmission.

The following descriptions are based on the example of the UMG 801 as the basic device. The illustrations and descriptions may differ for other basic devices.

The basic device provides the option of extending the range of functions using modules. The basic device automatically recognizes the module during the power-up procedure.

The menu item *Diagnostics* on the basic device is used to identify modules connected to the basic device. After starting the module identification, the LEDs of the modules being searched for blink at an interval (see Sect. "7.6.3 Module identification - LED blink interval" on p. 35).

The module identification can be configured using the menu item *Diagnostics* of the basic device. Then proceed as follows:

1. Press function button 1 *ESC* to open the menu.
2. Use buttons 2 (▲) and 5 (▼) to select the menu item *Diagnostics* and confirm with button 3 *Enter*.
3. The *Diagnostics* window appears.

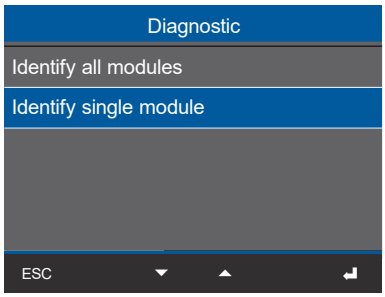


Fig. Window: Diagnostics with entries

4. In the *Diagnostics* window, use buttons 2 (▲) and 5 (▼) to select the item *Identify all modules* or *Identify one module.* These mean:

Identify all modules	Simultaneously identifies **all** modules connected to a basic device.
Identify one module	Identifies **one** module from the module topology of your basic device.

7.6.1 Identifying all modules

1. In the *Diagnostics* window, use buttons 2 (▲) and 5 (▼) to select the menu item *Identify all modules* and confirm with button 3 *Enter*.
2. The window *Identify all modules* appears.

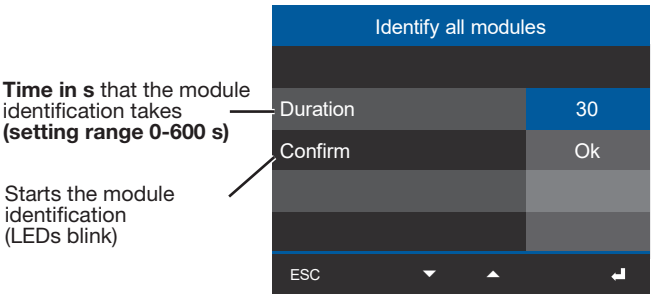


Fig. Window, Identify all modules

3. In the *Identify all modules* window, use buttons 2 (▲) and 5 (▼) to select the menu item *Duration* and confirm with button 3 *Enter*.
4. The first digit of the entry *Duration* blinks.
5. Use buttons 4 (◀) and 6 (▶) to change the position of the digit to be set and buttons 2 (▲) and 5 (▼) to change the digit (-1/+1).
6. Confirm your entries with key 3 *Enter*.
7. Use button 1 *ESC* and button 5 (▼) to access the item *Confirm*.
8. Press button 3 *Enter.*
9. In the entry *Confirm*, *OK* blinks.
10. Pressing button 3 *Enter* starts the identification of all modules using a blink interval of the LEDs (see Sect. "7.6.3 Module identification - LED blink interval" on p. 35).

7.6.2 Identifying one module

1. In the *Diagnostics* window, use buttons 2 (▲) and 5 (▼) to select the menu item *Identify one module* and confirm with button 3 *Enter*.
2. The *Identify one module* window appears.

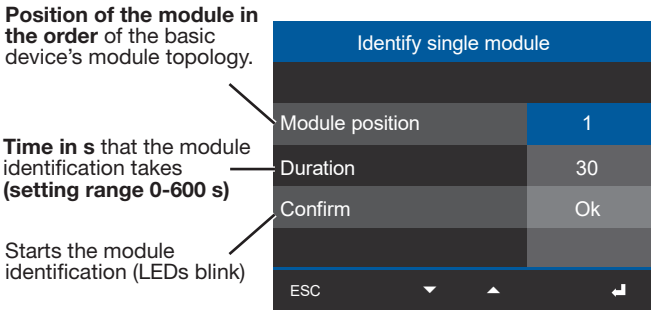


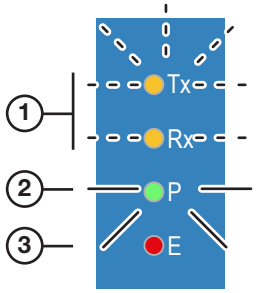
Fig. Window: Identify one module

1. In the *Identify one module* window, use buttons 2 (▲) and 5 (▼) to select the menu item *Module position* and confirm with button 3 *Enter*.
2. The entry *Module position* blinks.
3. Use the buttons 2 (▲) and 5 (▼) to enter the position number of the module to be identified (the position number depends on the number of modules connected in series to the basic device).
4. Confirm the entry with key 3 *Enter*.
5. Use button 1 *ESC* and button 5 (▼) to access the item *Duration*.
6. Press button 3 *Enter.*
7. The first digit of the entry *Duration* blinks.
8. Use buttons 4 (◀) and 6 (▶) to change the position of the digit to be set and buttons 2 (▲) and 5 (▼) to change the digit (-1/+1).
9. Confirm your entries with key 3 *Enter*.
10. Use button 1 *ESC* and button 5 (▼) to access the item *Confirm*.
11. Press button 3 *Enter.*
12. In the entry *Confirm*, *OK* blinks.
13. Pressing button 3 *Enter* starts the module identification with a blink interval of the LEDs on the corresponding module (see Sect. "7.6.3 Module identification - LED blink interval" on p. 35).

7.6.3 Module identification - LED blink interval

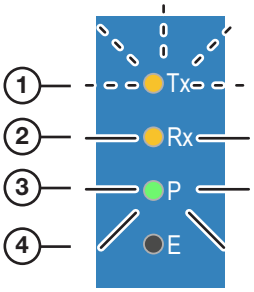
The module identification (diagnostics) procedure started on the basic device triggers a blink interval of the LEDs on the modules. The blink interval of the functions ***Identify one module*** and ***Identify all modules*** works the same way for a single module or for all modules!

LED status of the module in operation:



Item	Description
1	Blink *orange* during operation, signaling cyclic data exchange (Tx ... Transmit data, Rx ... Receive data).
2	Lights *green* if the power supply via the JanBus interface of the basic device is correct, the device is ready for operation (P ... Power).
3	Lights *red* during initialization/startup and in the event of a fault (error). Note in this regard Sect. "15.2 Modules - Error cases" on p. 59.

LED status of the module during module identification:



Item	Description
1	Blinks *orange* for the *Duration* of the module identification.
2	Lights *orange* for the *Duration* of the module identification.
3	Lights *green*
4	Off.

INFORMATION

During the **Duration of individual module identification**, the blink intervals of all other modules connected to the basic device are paused.

8. Module communication / PC connection

8.1 Module communication

The basic device connected to your module uses a built-in **Ethernet interface** to communicate with a PC.

The basic device with module can be configured via the measurement device display, using the GridVis software, or on the measurement device homepage. Further information on configuration can be found in the chapter "10. Module-relevant configurations" on page 42.

INFORMATION

Further information on PC connections can be found in the respective user manual for the basic device.

8.2 PC connection of the basic device to the module

The PC connections of the basic device or your module series via the Ethernet interface are shown below using the UMG 801 as an example for other basic devices.

8.2.1 Connection to a DHCP server and PC

The DHCP server automatically assigns IP addresses to the basic device (with modules) and the PC.

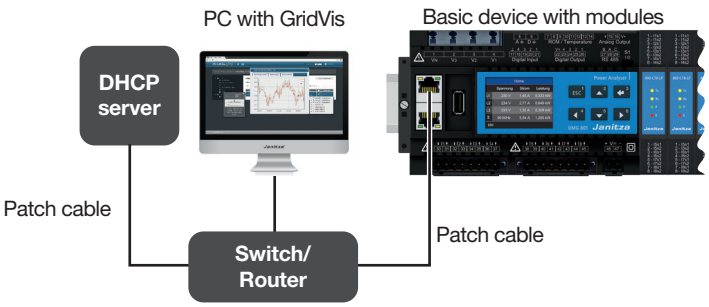


Fig. example: PC connection with DHCP server and PC

8.2.2 Direct PC connection to the basic device with module or your module series via the Ethernet interface

The PC and basic device require a fixed IP address.

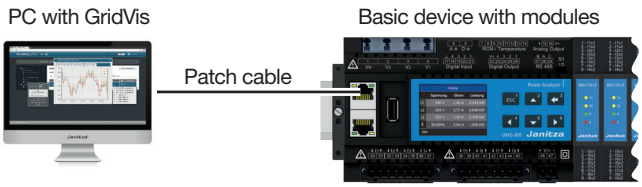


Fig. example: PC direct connection

INFORMATION

The figures described are examples. In conjunction with the basic device, there are numerous variants of topologies for devices and modules. Please refer to the usage information for the basic device and the modules of your devices and module topology.

8.3 Module communication options

8.3.1 Module handling in the GridVis software

The interface of the GridVis Power Grid Monitoring Software graphically displays the modules connected to the basic device.

A user can configure various types of module handling in the GridVis software, including:

· Automatic module recognition
· Module addition at the end of the module topology of a basic device.
· Module addition within the module topology of a basic device.
· Module removal at the end of the module topology of a basic device.
· Module removal within the module topology of a basic device.
· Module swap.
· Module configuration swap (measurement).
· Data storage and data transfer.
· Swap out basic device.

INFORMATION

A description of how to configure the modules in the GridVis software can be found in the online help or the tutorials for the software.

8.3.2 Basic device homepage

Another option for configuring modules or reading out measured values is available via the measurement device homepage of the basic device. You can access the measurement device homepage by entering the basic device's IP address in your web browser.

All further descriptions of the measurement device homepage can be found in the usage information for the basic device.

9. Operation, display and button functions

9.1 Operation and button functions of the basic device with module 800-MF8

The UMG 801 basic device with module features a display and function buttons for installation, commissioning, and configuration without a PC.

INFORMATION

- The configuration of your module and the display of module-relevant measurement data is carried out via the basic device.
- Information on operation, the display and the button functions can be found in the usage information for the basic device.

9.2 Module-relevant menu items of the UMG 801 basic device with 800-MF8 modules

The following illustrations and descriptions show module-relevant menu items in the measurement device display using the example of the UMG 801 as a basic device with 800-MF8 modules.

The menu items in the measurement device display of the basic device

- include, for example with the UMG 801 as the basic device, up to 12 module entries with the respective position number, depending on the slot assignment. For additional basic devices, please refer to the maximum number of modules in "Tab. Suitable basic devices" on p. 2.
- Can be configured with your own measurement group name in the GridVis software (max. 255 characters).
- Appear in the title line as scrolling text depending on the text length.

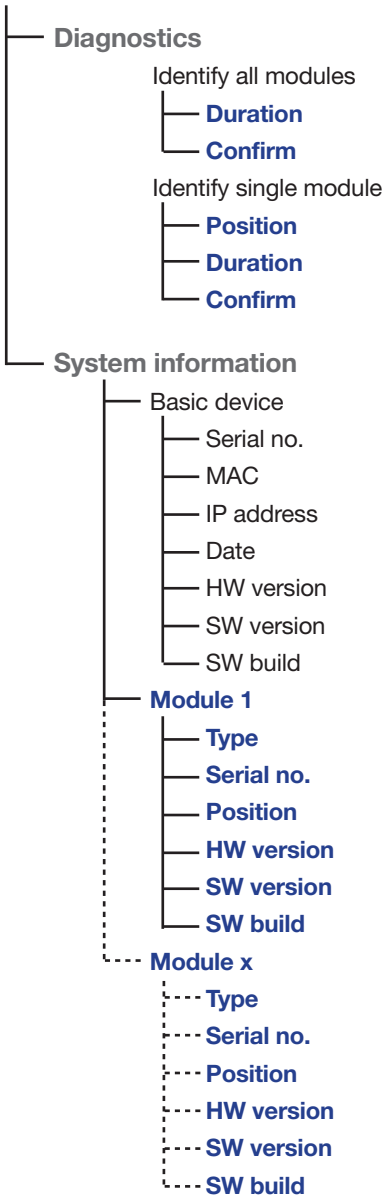
INFORMATION

In the *Current* menu, depending on the configuration of the inputs, measured values for temperature, RCM, and analog measurements are also displayed.

- **Menu**
  - **Home (start screen, 1st measuring display)**
  - **Phasor diagram**
    - Basic device 1-4
    - Basic device 5-8
    - **1. Modules 1-4**
    - **1. Modules 5-8**
    - ⋮
    - **12. Modules 1-4**
    - **12. Modules 5-8**
  - **Voltage**
    - L-N
    - L-L
    - THD
  - **Current**
    - Current
      - Basic device 1-4
      - Basic device 5-8
      - **1. Modules 1-4**
      - **1. Modules 5-8**
      - ⋮
      - **12. Modules 1-4**
      - **12. Modules 5-8**
    - THD-I
      - Basic device 1-4
      - Basic device 5-8
      - **1. Modules 1-4**
      - **1. Modules 5-8**
      - ⋮
      - **12. Modules 1-4**
      - **12. Modules 5-8**
  - **Power**
    - Power summary
      - Basic device 1-4
      - Basic device 5-8
      - **1. Modules 1-4**
      - **1. Modules 5-8**
      - ⋮
      - **12. Modules 1-4**
      - **12. Modules 5-8**
    - Active power
      - Basic device 1-4
      - Basic device 5-8
      - **1. Modules 1-4**
      - **1. Modules 5-8**
      - ⋮
      - **12. Modules 1-4**
      - **12. Modules 5-8**
    - Reactive power
      - Basic device 1-4
      - Basic device 5-8
      - **1. Modules 1-4**
      - **1. Modules 5-8**
      - ⋮
      - **12. Modules 1-4**
      - **12. Modules 5-8**
    - Apparent power
      - Basic device 1-4
      - Basic device 5-8
      - **1. Modules 1-4**
      - **1. Modules 5-8**
      - ⋮
      - **12. Modules 1-4**
      - **12. Modules 5-8**
    - Power factor
      - Basic device 1-4
      - Basic device 5-8
      - **1. Modules 1-4**
      - **1. Modules 5-8**
      - ⋮
      - **12. Modules 1-4**
      - **12. Modules 5-8**

- **Energy**
  - Active energy
    - Basic device 1-4
    - Basic device 5-8
    - **1. Modules 1-4**
    - **1. Modules 5-8**
    - ⋮
    - **12. Modules 1-4**
    - **12. Modules 5-8**
  - Reactive energy
    - Basic device 1-4
    - Basic device 5-8
    - **1. Modules 1-4**
    - **1. Modules 5-8**
    - ⋮
    - **12. Modules 1-4**
    - **12. Modules 5-8**
  - Apparent energy
    - Basic device 1-4
    - Basic device 5-8
    - **1. Modules 1-4**
    - **1. Modules 5-8**
    - ⋮
    - **12. Modules 1-4**
    - **12. Modules 5-8**
- **Drag indicator**
- **Multifunction channels**
  - Current measurement
  - Temperature
  - RCM overview
  - RCM bar graphs
  - Linewriter RCM
- **Digital I/O status**
  - Basic device
  - Modules (see user manual "800-DI14 digital input module")

- **Configuration**
  - Ethernet config. A
    - IP config.
    - IP address
    - Netmask
    - Gateway
  - Ethernet config. B
    - IP config.
    - IP address
    - Netmask
    - Gateway
  - Fieldbus
    - Device addr.
    - Baud rate
    - Data frame
  - Current transformer
    - Basic device
      - Transformer prim./sec.
    - **1. Modules**
      - **Transformer prim./sec.**
    - **12. Modules**
      - **Transformer prim./sec.**
  - Voltage transformer
    - Voltage transformer
  - Display
    - Language
    - Standby delay
    - Brightness
  - System
    - PIN
    - Reboot
    - Time
    - Date
  - Reset
    - Factory settings
    - Configuration
    - Min./Max./Avg.
    - Energy
    - Historical data


Diagnostics
Identify all modules
Duration
Confirm
Identify single module
Position
Duration
Confirm
System information
Basic device
Serial no.
MAC
IP address
Date
HW version
SW version
SW build
Module 1
Type
Serial no.
Position
HW version
SW version
SW build
Module x
Type
Serial no.
Position
HW version
SW version
SW build

10. Module-relevant configurations

10.1 LP current transformer configuration on the basic device

In this user manual, the term **"current transformer"** is used for special transformers for the proportional conversion of currents of large amperages to directly measurable, smaller **current values**. In contrast, the term **"low-power current transformer"** is used for special transformers for the proportional conversion of currents of large amperage to directly measurable, smaller **voltage values**.

Current transformers and current sensors provide a safe galvanic isolation between the primary circuit and the measurement circuit due to their constructive design and their physical operating principle.

For simplicity, basic devices use only the term "current transformer" in the display for the configuration of both current transformers and LP current transformers.

INFORMATION

Please note that before configuring LP current transformer ratios, the LP current transformers must be connected in accordance with the information on their nameplates and the technical data.

The following descriptions are based on the example of the UMG 801 as the basic device. The illustrations and descriptions may differ for other basic devices.

1. Press function button 1 *ESC* to open the menu.
2. Use buttons 2 (▲) and 5 (▼) to select the menu item *Configuration* and confirm with button 3 *Enter*.
3. The *Configuration* window appears.
4. In the *Configuration* window, use buttons 2 (▲) and 5 (▼) to select the menu item *Current transformers* and confirm with button 3 *Enter*.

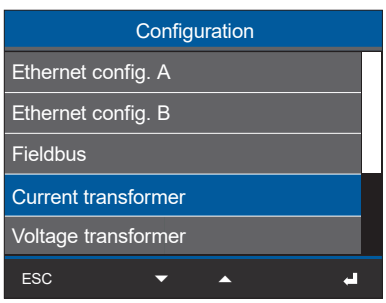


Fig. Window Configuration -> item Current transformer

5. The *Current transformers* window appears.

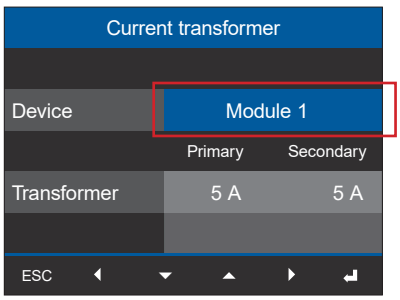


Fig. Window Current Transformers -> Modules

6. In the *Current transformers* window, use buttons 2 (▲) and 5 (▼) to select the item *Basic device* and confirm with button 3 *Enter*.
7. The item *Basic device* appears marked in *blue*.
8. Use buttons 2 (▲) and 5 (▼) to select the item for the module, e.g. *Module 1* and confirm with button 3 *Enter*.
9. Use button 5 (▼) to go to the setting for the primary side of the module's LP current transformers.
10. The item for the primary side of the LP current transformers appears marked in *blue*.
11. Press button 3 *Enter.*
12. The item for the primary side of the LP current transformers is blinking.
13. Use buttons 4 (◀) and 6 (▶) to change the position of the digit to be set and buttons 2 (▲) and 5 (▼) to change the digit (-1/+1).
14. Confirm your entries with button 3 *Enter* or end the action by pressing button 1 *ESC*.

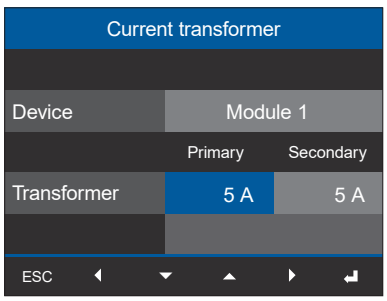


Fig. Window, Current transformer module 1 -> item: Primary for LP current transformers.

15. Use button 6 (▶) to go to the configuration of the secondary side of the LP current transformers of the module.
16. Configure the secondary side of the LP current transformers of the module in the same way (note here the nominal voltage in mV for the LP current transformers).
17. Confirm your entries with button 3 *Enter* or end the action by pressing button 1 *ESC*.

10.2 Configuring the multifunction channels using the measurement device homepage

One option for configuring the multifunction channels on the module is via the measurement device homepage of the basic device.

1. Open the measurement device homepage by entering the IP address in your browser.
2. Open the configuration for the module's multifunction channels under > *Configuration* > *Measurement group settings*.
3. Select the measurement group mode:
   - *Single measurement*: Each channel is freely configurable.
   - *Three-phase system*: Channels 1-3 are automatically set to the current measurement (LP) measuring mode. The 4th channel can be freely configured, just as in a single measurement.
4. Configure your measurement. To apply the configuration, click the Save button.

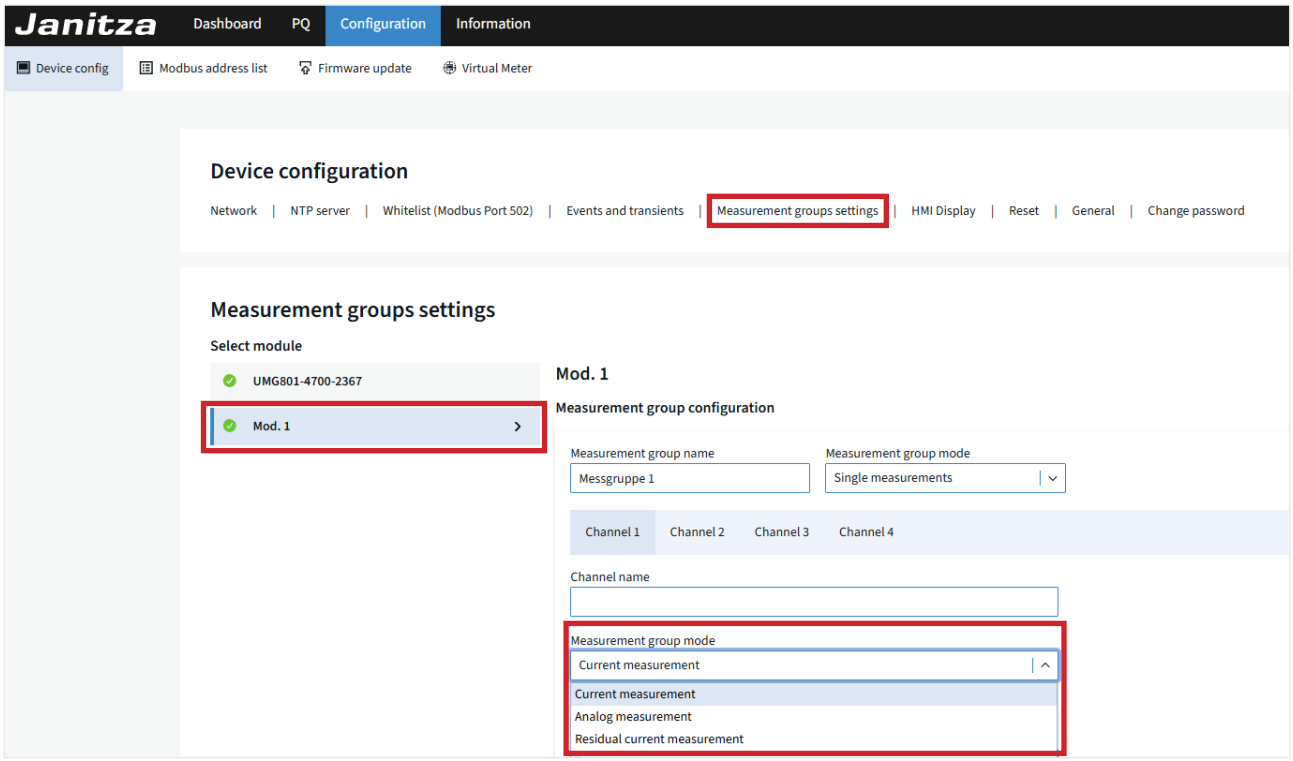


Fig. Configuring the multifunction channels using the measurement device homepage of the basic device

10.2.1 Configuring LP current measurement using measurement device homepage

1. Select the ***Current measurement*** measuring mode.
2. If the current transformer connections were connected incorrectly during installation, you can swap the connection polarity using the switch *Swap s1(k) and s2(l)*.
3. Select a voltage reference for current measurement.
4. Enter the rated nominal current of the current transformer in the *Nominal value* input field and select the appropriate unit.
5. Enter the primary and secondary current in accordance with the technical data of the current transformer.
6. If necessary, enter a correction value for amplitude and phase to correct the measurement signals.

10.2.2 Configuring analog measurement using the measurement device homepage

1. Select the *Analog measurement* measuring mode.
2. Select a value type.
   - If you have selected "*User-defined*" as the value type, specify a sensor type and the corresponding unit.
3. Enter the input signal, mode, and the transformer values according to the analog sensor.

10.2.3 Configuring temperature measurement using the measurement device homepage

1. Select the *Temperature measurement* measuring mode.
2. Select the *Sensor type* for your temperature sensor.
3. Set a *Sensor unit* for the temperature measurement and the temperature offset.
4. If the connected temperature sensor shows a deviation from a more accurate reference thermometer, set an *Offset* to correct the deviation.

10.2.4 Residual current measurement using the measurement device homepage

1. Select the *Residual current detection* measuring mode.
2. If the current transformer connections were connected incorrectly during installation, you can swap the connection polarity using the switch *Swap s1(k) and s2(l)*.
3. Select the input signal based on your measurement.
4. Enter the ratio of the residual current transformer according to the technical data.
5. Activate the switch *Cable break detection* so that the device monitors the connection to the residual current transformer. The cable break detection only works with passive current transformers (AC) and current transformers with a 4-20 mA secondary output.
6. Configure the *RCM settings*. Depending on the mode, you may have various additional configuration options.
   - *Static*: If a static residual current threshold is exceeded, an alarm is triggered.
   - *Dynamic*: In dependence on a reference value, the residual current threshold for violations changes continuously and with it the respective alarm activation. The limit value is calculated from the reference value multiplied by a scaling factor plus a static offset.
   - *Stepwise*: Depending on the power level (reference value), the residual current threshold for violations changes step-by-step. Different limit values can be defined for up to 10 power levels. The residual current threshold is calculated by adding the static threshold offset to the threshold of the highest power level whose threshold has been exceeded.

INFORMATION

Further information on limit value calculation can be found in the chapter "7.5.4 Residual current detection - limit value calculation" on page 30.

10.3 Multifunction channel configuration in the GridVis software

Configure the module's multifunction channels in the GridVis software.

1. Select the individual multifunction channels in the device view.
2. Set the desired measuring mode for each channel: Temperature measurement, current measurement (LP), analog input, or residual current measurement.
3. Configure the measurement in accordance with the measuring mode.

More information can be found in the GridVis online help in the section
Working with GridVis > Device configurator.

Information on the various measuring modes and compatible temperature sensor types can be found in the chapter "Technical data" on page 54.

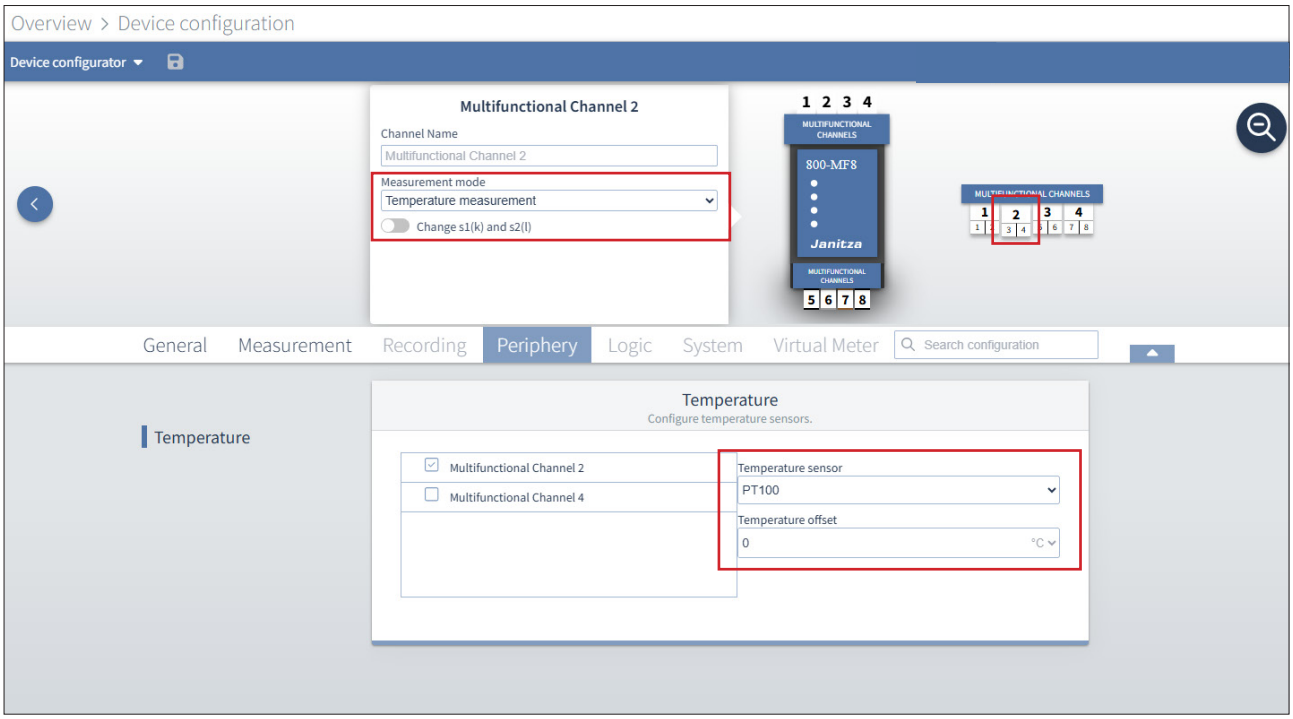


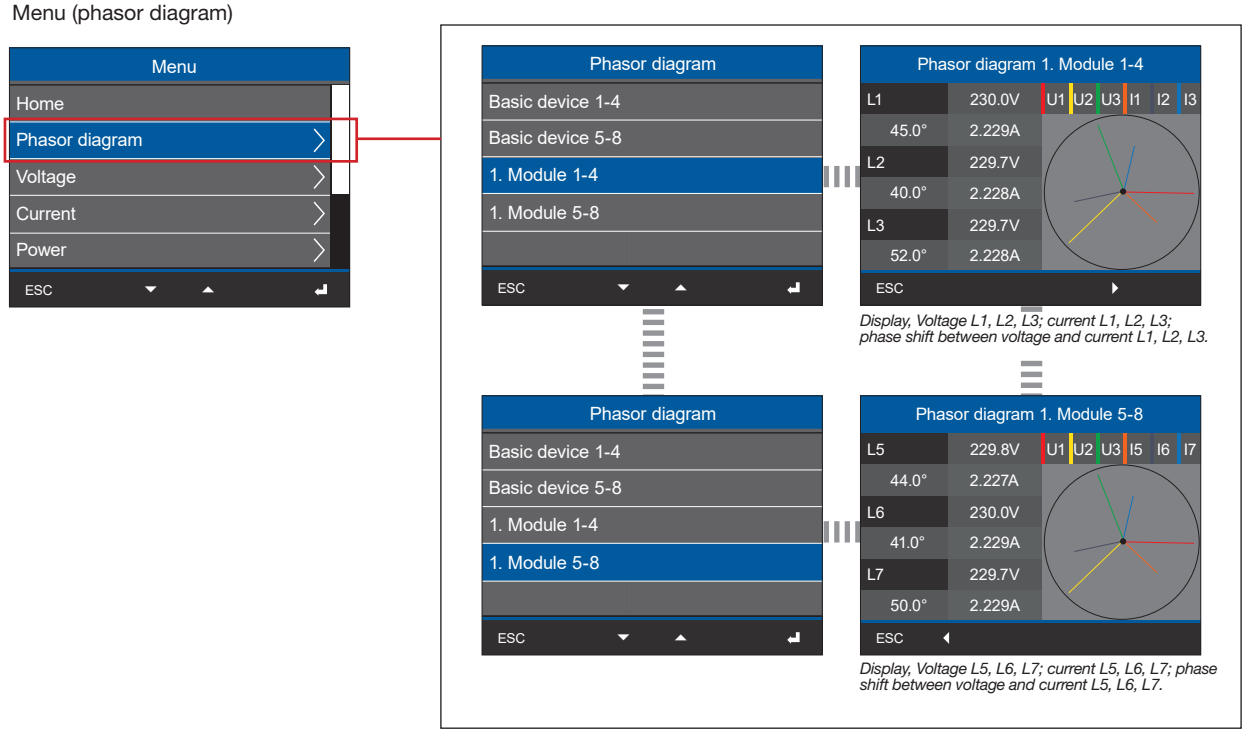
Fig. Configuration of the multifunction channels in GridVis (example: temperature measurement)

11. Module-relevant measuring displays

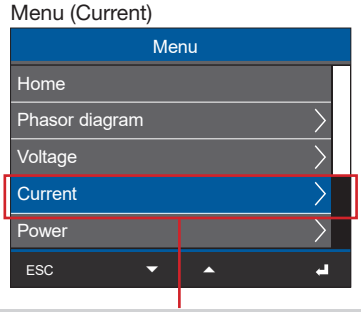
INFORMATION

- The following measured value and instrument displays of the basic device do not show a concrete application and may differ depending on the connection of your basic device with modules and the measuring environment!
- The permitted number of modules on a basic device can be found in "Tab. Suitable basic devices" on p. 2.
- You can change the names of the basic device, the modules or the measurement groups shown in the measurement device display using the device configuration of the GridVis software.
- The measurement device display shows the measurement group names with the respective position number of the module.
- Depending on the text length, measurement group names appear as scrolling text in the title line of the measurement device display.
- Further measured value and instrument displays can be found in the usage information for the basic device.

Menu (phasor diagram)



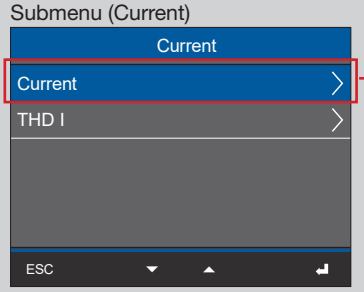
Menu (Current)

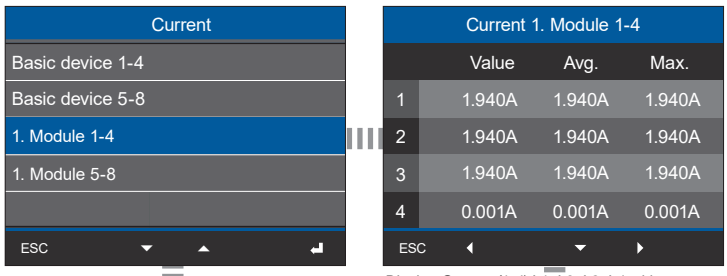


INFORMATION

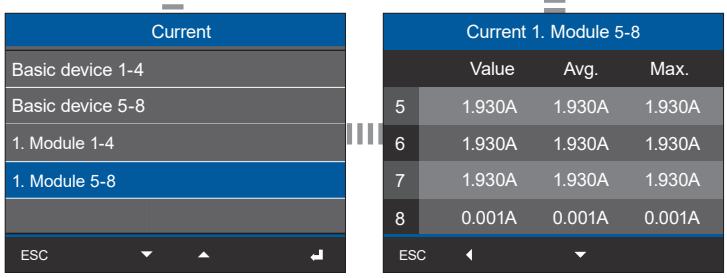
In the *Current* menu, depending on the configuration of the inputs, measured values for temperature, RCM, and analog measurements are also displayed.

Submenu (Current)



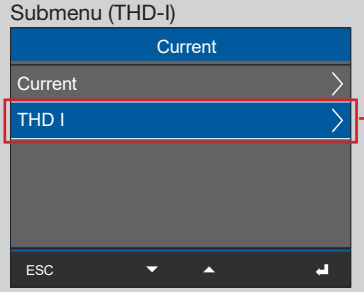


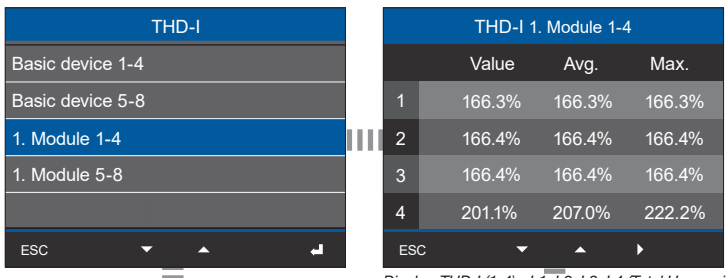
Display, Current (1-4) L1, L2, L3, L4 with mean and maximum values.



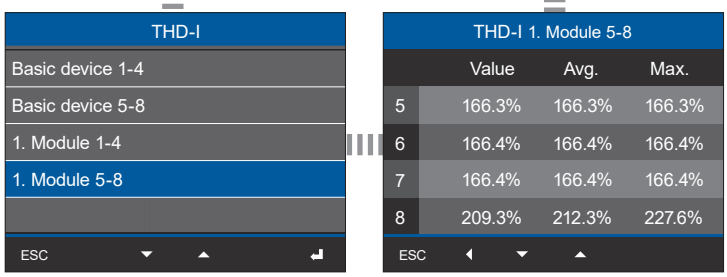
Display, Current (5-8) L5, L6, L7, L8 with mean and maximum values.

Submenu (THD-I)



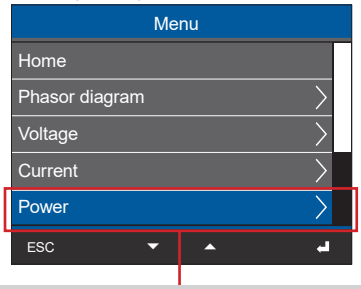


Display, THD-I (1-4) - L1, L2, L3, L4 (Total Harmonic Distortion of the current in %) with average and maximum values.

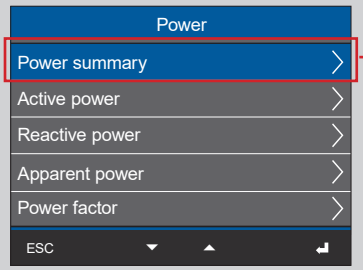


Display, THD-I (5-8) - L5, L6, L7, L8 with mean and maximum values.

Menu (Power)

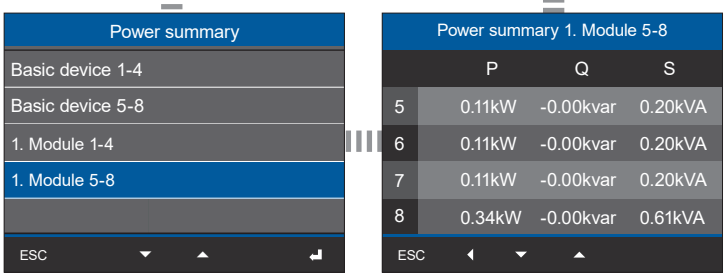


Submenu (Power summary)



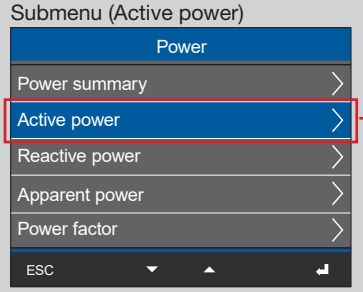


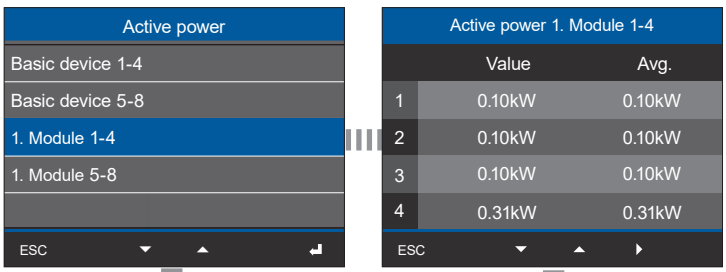
Display, Summary of active, reactive and apparent power for L1, L2, L3 and their sum.



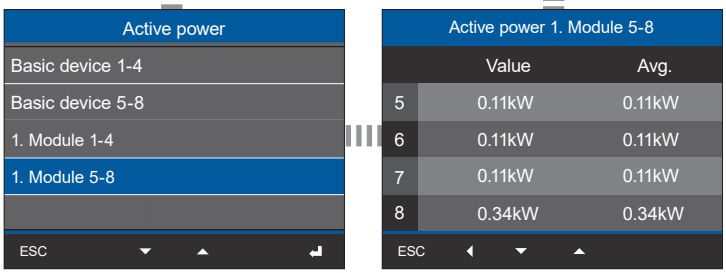
Display, Summary of active, reactive and apparent power for L5, L6, L7 and their sum.

Submenu (Active power)



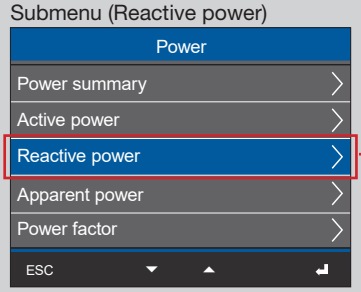


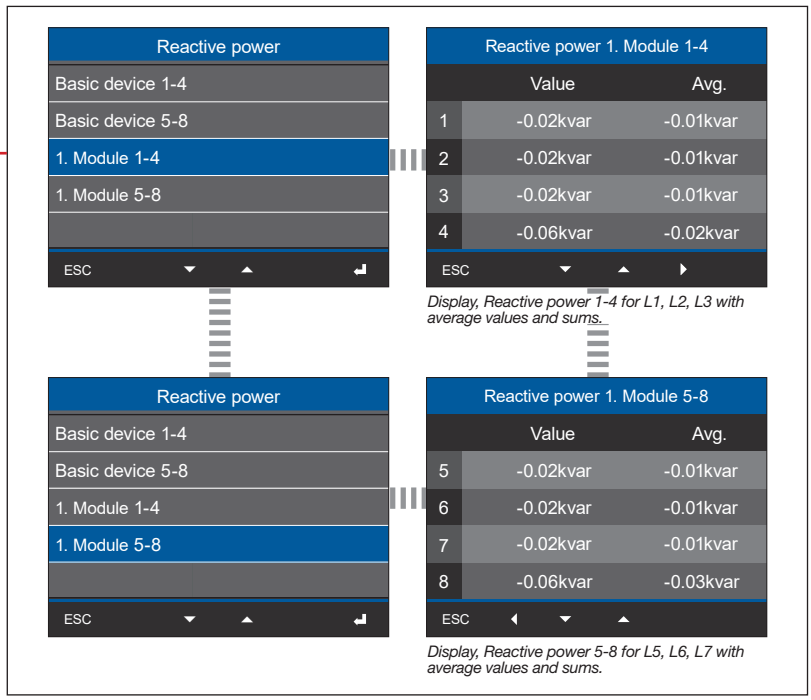
Display, Active power 1-4 for L1, L2, L3 with average values and sums.



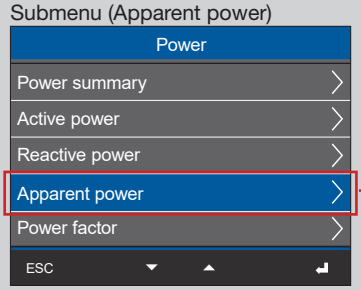
Display, Active power 5-8 for L5, L6, L7 with average values and sums.

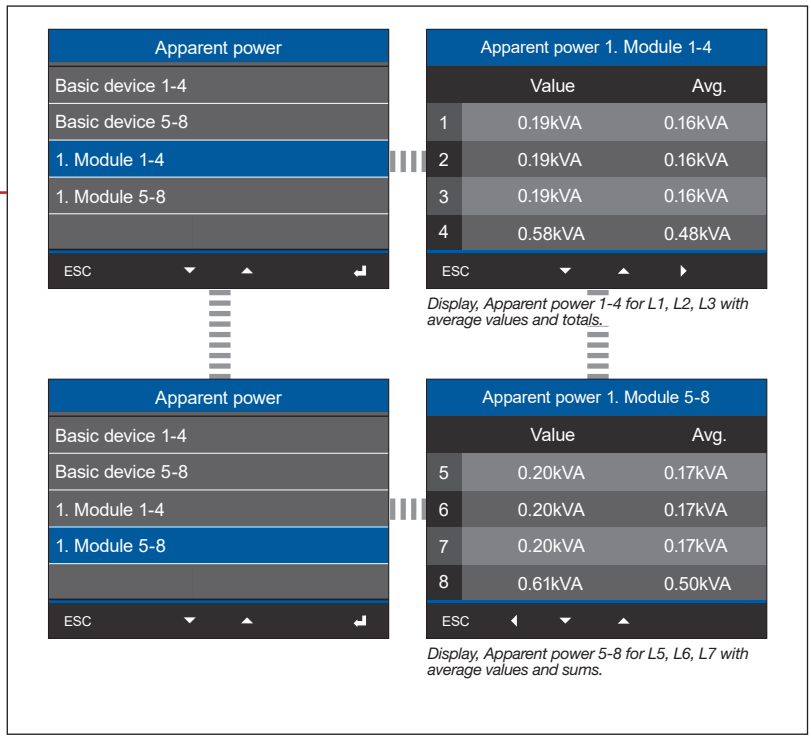
Submenu (Reactive power)



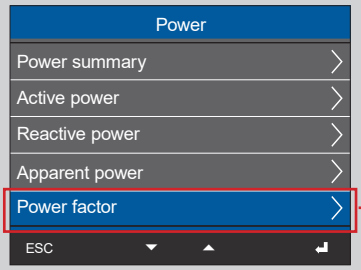


Submenu (Apparent power)



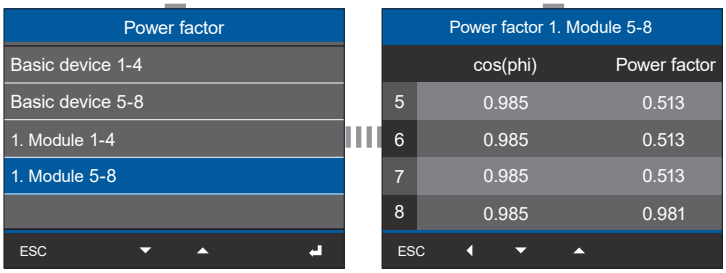


Submenu (Power factor)



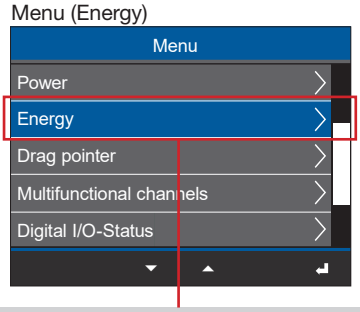


Display, Power factor 1-4 for L1, L2, L3 with cos(phi) and sums.

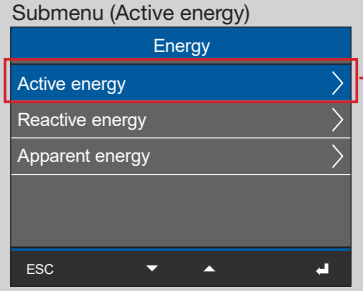


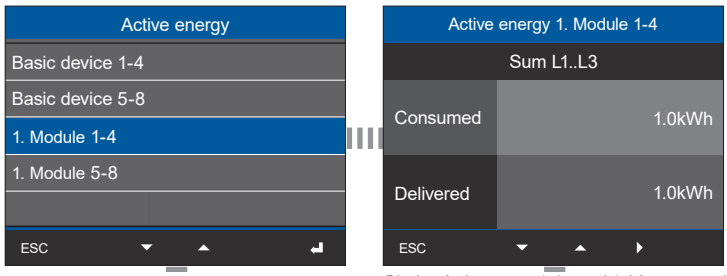
Display, Power factor 5-8 for L5, L6, L7 with cos(phi) and sums.

Menu (Energy)

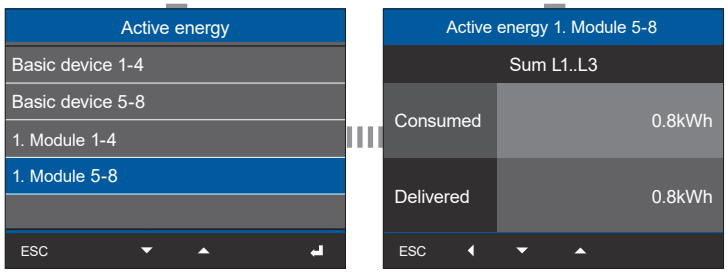


Submenu (Active energy)



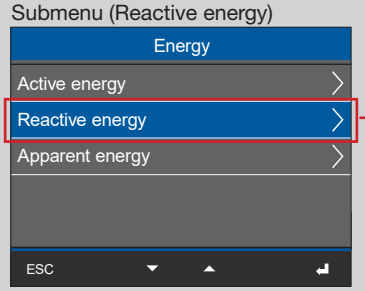


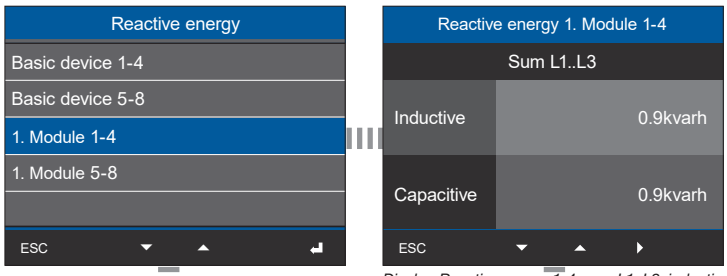
Display, Active energy 1-4, sum L1..L3, consumed and delivered.



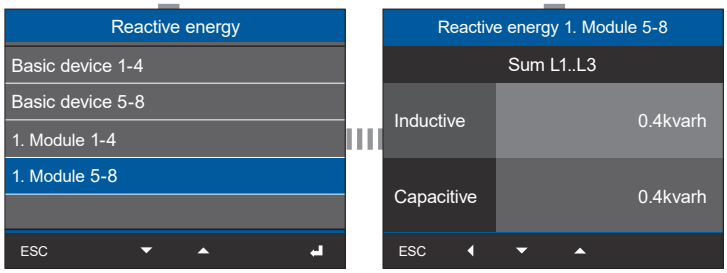
Display Active energy 5-8, sum L1..L3, consumed and delivered.

Submenu (Reactive energy)



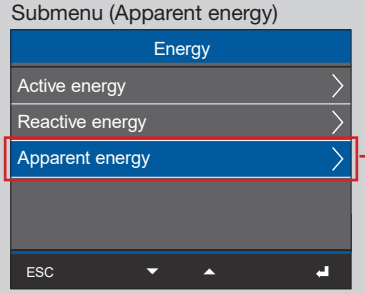


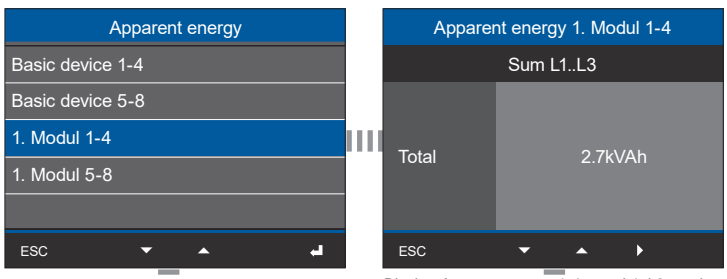
Display, Reactive energy 1-4, sum L1..L3, inductive and capacitive.



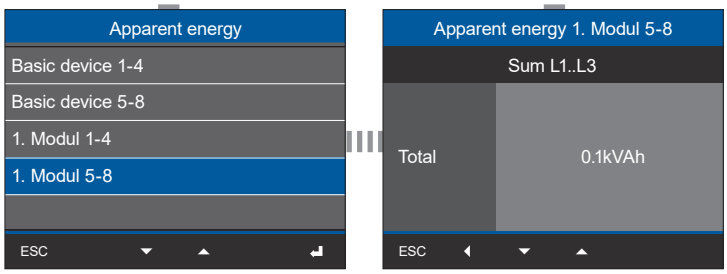
Display, Reactive energy 5-8, sum L1..L3, inductive and capacitive.

Submenu (Apparent energy)



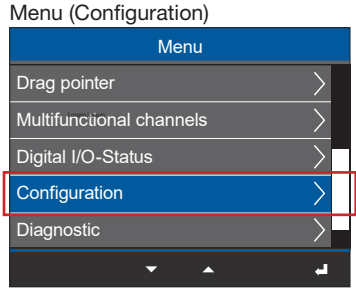


Display, Apparent energy 1-4, sum L1..L3, total.



Display, Apparent energy 5-8, sum L1..L3, total.

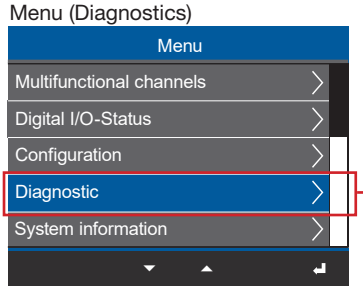
Menu (Configuration)

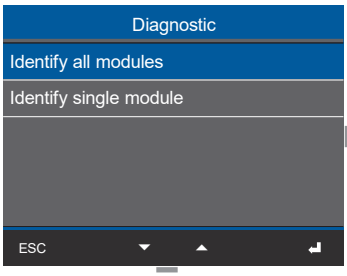


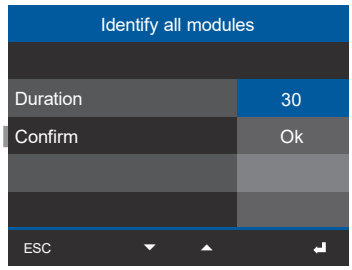
INFORMATION

The description of the LP current transformer configuration of the modules can be found in chapter "10. Module-relevant configurations" on page 42.

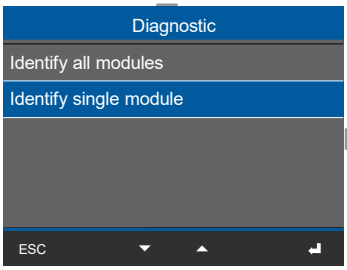
Menu (Diagnostics)

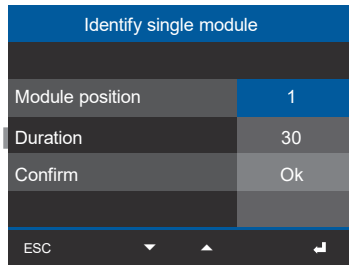






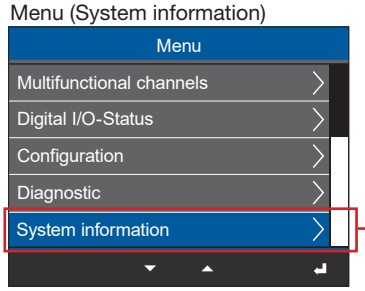
The display "Identify all modules with duration and confirm".

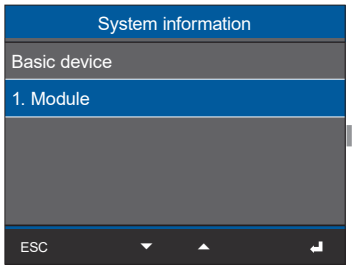


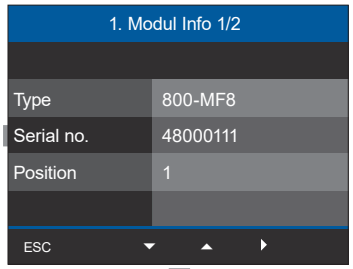


The display "Identify one module with module position, duration and confirm".

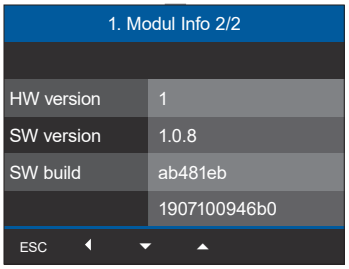
Menu (System information)







Display, Module 1 information 1/2

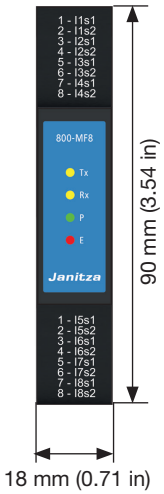


Display, Module 1 information 2/2

12. Device views

· The views are for illustration purposes only and are not to scale.
· Dimensions in mm (in).

Front view



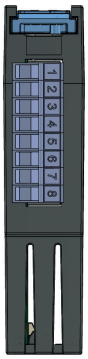
INFORMATION

The dimensions of the device/module vary depending on the connection terminals used.

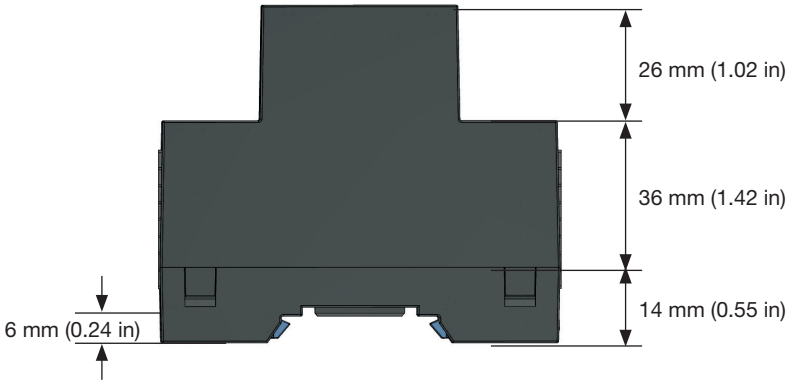
Bottom view



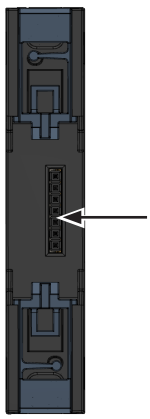
Top view



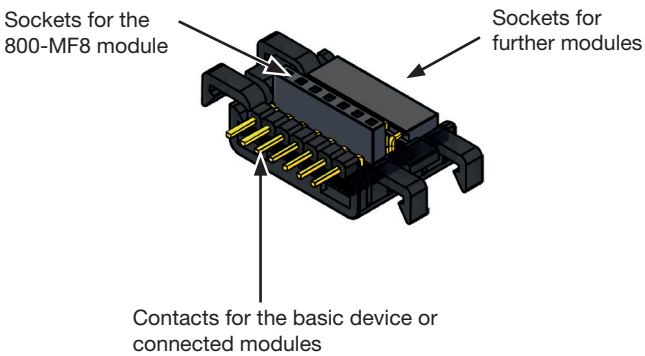
View from left



Rear view



Communication bus connector to the 800-MF8 module



13. Technical data

13.1 Technical specifications

General	
Net weight (with terminals)	73 g (0.16 lb)
Device dimensions (without connection terminals)	W = 18 mm (w = 0.71 in), H = 90 mm (h = 3.54 in), D = 76 mm (d = 2.99 in)
Width of the device in horizontal pitches	1 HP (1 HP = 18 mm (0.71 in))
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
Protection against foreign matter and water	IP20 according to EN 60529
Impact resistance	IK07 according to IEC 62262

Transport and storage The following specifications apply to devices transported and stored in the original packaging.	
Free fall	1 m (39.37 in)
Temperature	-25 .. +70 °C (-13 .. 158 °F)
Relative humidity	5 .. 95% at 25 °C (77 °F), non-condensing

Environmental conditions during operation	
The module · must only be operated with suitable basic devices (see "Tab. Suitable basic devices" on p. 2). · must be used indoors in a fixed location that is protected from the weather. · possesses protection class II according to IEC 61010-1, a ground wire connection is not required.	
Working temperature	-10 .. +55 °C (14 .. 131 °F)
Relative humidity	Decreasing linearity: at 31 °C (88 °F) max. 80 % at 40 °C (104 °F) max. 50 % (non-condensing)
Operating elevation	Up to 4000 m (13,123 ft) above sea level
Pollution degree	2
Ventilation	No forced ventilation required
Supply voltage	Via basic device

Current measurement using LP current transformer	
Nominal input signal	333 mV
Measurement via low-power current transformers with a secondary voltage of (measuring range)	0 .. 400 mV
Channels	8 (2x4) 2 systems - L1, L2, L3, N Single channels
Input impedance per channel	100 kΩ || 50 pF
Maximum Input Signal (Peak)	600 mVp
Overload for 1 s	1 V
Resolution	16 bit
Sampling frequency	8.14 kHz
Frequency of the fundamental oscillation	40 .. 70 Hz
Harmonics	1. .. 25. (odd only)

Residual current measurement (RCM)	
Nominal current	30 mA
Measuring range	0 .. 40 mA
Operating current	50 µA
Resolution	16 bit
Temperature coefficient	<50 ppm / °C
Maximum Input Signal (Peak)	85 mAp
Load	max. 4 Ω
Overload for 1 s	0.9 A
Permanent overload	0.3 A
RCM types	Type A, type B and B+ (using corresponding current transformers)

Temperature measurement				
Update time		200 ms		
Total load (sensor and cable)		max. 4 kΩ		
Cable		Up to 30 m (32.81 yd) not shielded Greater than 30 m (32.81 yd) shielded		
Suitable temperature sensor types		· KTY83, KTY84 · PT100, PT1000 (Class C according to IEC 60751)		
Measuring accuracy	**Temperature sensor type**	**Temp. range**	**Resistance range**	**Measurement uncertainty**
	KTY83	-55 .. +175 °C (-67 .. +347 °F)	500 Ω .. 2.6 kΩ	±1.5 % rng
	KTY84	-40 .. +300 °C (-40 .. +572 °F)	350 Ω .. 2.6 kΩ	±1.5 % rng
	PT100	-100 .. +500 °C (-148 .. +932 °F)	60 Ω .. 280 Ω	±1.5 % rng
	PT1000	-100 .. +500 °C (-148 .. +932 °F)	600 Ω .. 2.8 kΩ	±1.5 % rng

Analog measurement 0..20 mA	
Nominal current	0 .. 20 mA
Load	Max. 4 Ω
Overload for 1 s	0.9 A
Permanent overload	0.3 A
Measuring accuracy	± (0,5 % rdg. + 100 µA)
Resolution	16 bit
Temperature coefficient	<50 ppm / °C
Sampling frequency	8.14 kHz

Interface and energy supply	
JanBus (proprietary)	via bus connector
Supply voltage (via JanBus interface)	24 V

Connection capacity of the terminals - Spring terminals (push-in terminals) Connectible conductors. Only connect one conductor per terminal point!	
Single core, multi-core, fine-stranded (min. - max.)	0.14 mm^2 - 1.5 mm^2, AWG 26-16
Wire ferrules with collar * to DIN 46 228/4, (min. - max.)	0.25 mm^2 - 1 mm^2, AWG 22-17
Wire ferrules without collar to DIN 46 228/1, (min. - max.)	0.25 mm^2 - 1.5 mm^2, AWG 22-16
Wire ferrules: - Contact sleeve length ** - Strip length	 - 8 - 12 mm (0.31 - 0.47 in) - 10 - 12 mm (0.39 - 0.47 in)

* ... Applies to wire ferrules with a maximum plastic collar outer diameter of up to 3.5 mm (0.14 in).
**.. Depending on the type of wire ferrules used (wire ferrules manufacturer).

LEDs 800-MF8 module	
Tx (send data)	Blink *orange* during operation and indicate cyclic data exchange.
Rx (receive data)	
P (power - power supply)	Lights *green* if the power supply via the JanBus interface is correct.
E (error – initialization and malfunction)	Lights *red* when initializing/starting the device and in the event of a fault.

INFORMATION

Detailed information on the functions and data of the basic device can be found in the usage information included with the basic device or is available for download at www.janitza.com.

13.2 Performance characteristics of functions

Function	Symbol	Accuracy class - 333 mV nominal voltage	Display range
Total active power	P	0.5 (IEC61557-12)	0 .. 999 GW
Total reactive power	QA, Qv	1 (IEC61557-12)	0 .. 999 Gvar
Total apparent power	SA, Sv	0.5 (IEC61557-12)	0 .. 999 GVA
Total active energy	Ea	0.5 (IEC61557-12) 0.5S (IEC62053-22)	0 .. 999 GWh
Total reactive energy	ErA, ErV	1 (IEC61557-12)	0 .. 999 Gvarh
Total apparent energy	EapA, EapV	0.5 (IEC61557-12)	0 .. 999 GVAh
Phase current	I	0.2 (IEC61557-12)	0 .. 999 kA
Neutral conductor current calculated	INc	1.0 (IEC61557-12)	0.03 .. 999 kA
Power factor	PFA, PFV	1 (IEC61557-12)	0.00 .. 1.00
Current harmonics	Ih	Cl. 1 (IEC61000-4-7)	0 A .. 999 kA
THD of the current	THD_I	1.0 (IEC61557-12)	0 .. 999%

14. Dismounting

ATTENTION

Handling your module too roughly may cause damage to the module and result in material damage!
The bus connector contacts and the bottom bolts can be damaged or broken off when dismounting your module.
- **Never pull the module out of the DIN rail with force!**
- **Remove the module from the DIN rail without touching or damaging the bus connector contacts!**
- **First decouple the bus connectors (JanBus interface) and carefully unlock the bottom bolts of the module with a screwdriver!**

1. Disconnect the supply of power to the system! Secure it against being switched on again! Check to be sure it is de-energized! Ground and short circuit! Cover or block off adjacent live parts!
2. Disconnect the wiring of your module.
3. Decouple the bus connectors (JanBus interface) of your module from the basic device and/or the connected modules by pulling out your module.
4. Unlock all bottom bolts of your module. **Recommendation:** Use a screwdriver for this (with care).
5. Remove your module from the DIN rail without touching or damaging the bus connector contacts.

ATTENTION

Material damage due to disassembly or decoupling of the module during operation!
Dismounting or decoupling the module during communication with the basic device can cause damage to your devices!.
- **Disconnect your system from the power supply prior to dismounting or disconnecting the module! Secure it against being switched back on! Check to be sure it is de-energized! Ground and short circuit! Cover or block off adjacent live parts!**

INFORMATION

After the 800-MF8 module has been dismounted, the GridVis software deactivates the corresponding module. Information on this and further procedures can be found in the online help for the GridVis software.

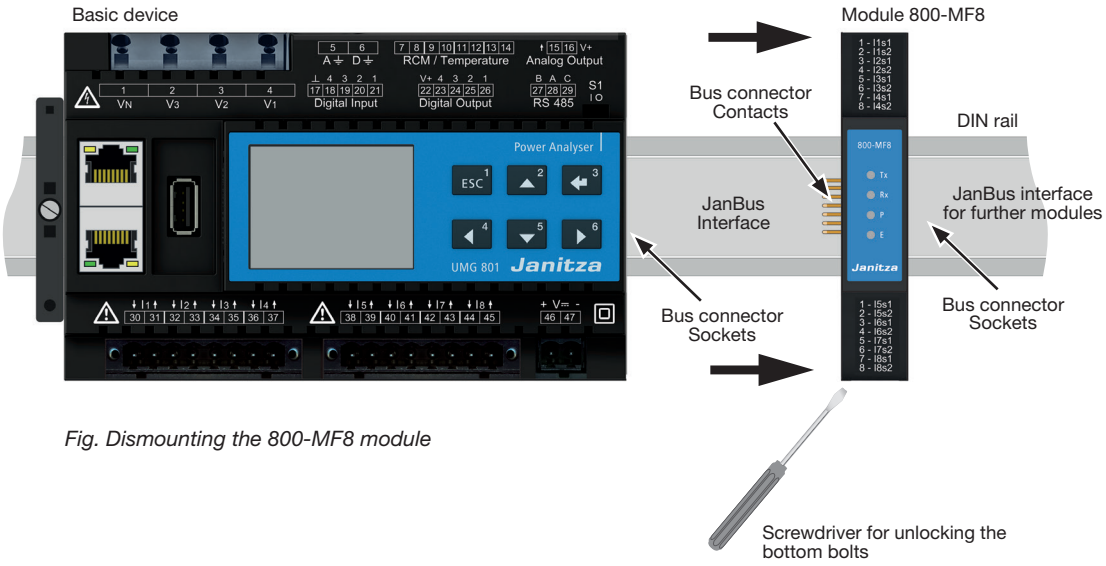


Fig. Dismounting the 800-MF8 module

15. Module exchange/error cases

Before replacing a module, refer to Sect. "14. Dismounting" on p. 57 and "4. Mounting" on p. 18.

ATTENTION

Handling your module too roughly may cause damage to the module and result in material damage!
The bottom bolts and the bus connector contacts can be damaged or broken off when dismounting your module.
- **Never pull the module out of the DIN rail with force!**
- **Remove the module from the DIN rail without touching or damaging the bus connector contacts!**
- **First remove the connection terminals with the wiring and then carefully unlock the bottom bolts of the module with a screwdriver!**

ATTENTION

Material damage due to disassembly or decoupling of the modules during operation!
Dismounting or decoupling the modules during communication with the basic device can cause damage to your devices.
- **Disconnect your system from the power supply prior to dismounting or decoupling the modules! Secure it against being switched back on! Check to be sure it is de-energized! Ground and short circuit! Cover or block off adjacent live parts!**

INFORMATION

After the 800-MF8 module has been dismounted, the GridVis software deactivates the corresponding module. Information on this and further procedures can be found in the online help for the GridVis software.

15.1 Module replacement

A module must be exchanged, for example, to replace a defective module with an intact module in your measurement device and module topology. Carry out the module exchange in the GridVis software.

On the basic device, a defective module in your measurement device and module topology can be recognized in the "Configuration" display. The defective module is missing in the *Configuration* display.

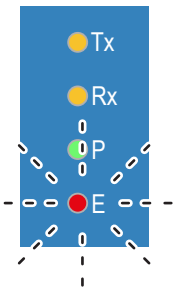
1. Remove the corresponding module as described in Sect. "14. Dismounting" on p. 57.
2. Replace, for example, a defective module with an intact one (see Sect. "4. Mounting" on p. 18).
3. Supply your meter and module topology (your system) with voltage.
4. Use the GridVis software (*Module exchange* function) to transfer data from a defective module (stored in the basic device) to the intact module.

INFORMATION

- Please note that the *Module exchange* function in the GridVis software causes data records from swapped modules to be overwritten in the memory of the basic device.
- A description of the module swap in the GridVis software can be found in the online help or the tutorials for the software.

15.2 Modules - Error cases

As already described in Sect. "7.6.3 Module identification - LED blink interval" on p. 35, the module has 4 LEDs.



In the event of an error, the red LED (E) of the module blinks during operation at an interval of **0.5 s**.

After the definition of the error state there is a pause of **2 s** and the blink interval starts again from the beginning (repetition loop).

The number of blinks indicates the following error states:

Number of blinks	Error state
0	No error - normal operation.
1	Waiting for termination of the start pulse for the termination.
2	Waiting for response of the following module.
3	Waiting for start of addressing pulse
4	Waiting for the end of the addressing pulse.
5	Termination failed.
10	Application could not be started, module is still in the bootloader.

Tab.: Allocation of blink intervals/error state

Proceed as follows in the event of a module error:

1. Check the basic device's firmware and, if necessary, update it to the latest version.
2. Restart your measurement device and module topology (basic device: *Menu* > *Configuration* > *System* > *Restart*).
3. Check the connections and the fit of the devices, modules and components of your measurement device and module topology while complying with the safety rules.

⚠ WARNING

Risk of injury due to electrical current and voltage!
Severe bodily injury or death can result! Therefore please abide by the following:
· **Do not touch bare, stripped wires or device inputs on the devices, components and modules that are dangerous to touch!**
· **Switch off your installation before commencing work! Secure it against being switched on again! Check to be sure it is de-energized! Ground and short circuit! Cover or block off adjacent live parts!**

4. If these measures do not lead to the desired result, contact our Support (www.janitza.com).

16. Service and maintenance

Prior to outbound delivery, your device (module/component) is subjected to various safety tests and is marked with a seal. If a device (module/component) is opened, the safety tests must be repeated. The warranty is only valid for unopened devices (modules/components).

16.1 Repair

Repairs can only be carried out by the manufacturer.

16.2 Service

If questions arise which are not described in this user manual, please contact the manufacturer.
To answer your questions, it is essential that you provide the following information:
· Device designation (see nameplate)
· Serial number (see nameplate)
· Hardware version (see system display)
· Software release (see system display)
· Measured voltage and supply voltage
· An exact error description.

16.3 Device adjustment

Devices (components/modules) are adjusted by the manufacturer prior to outbound delivery. No readjustment is required when the environmental conditions are complied with.

16.4 Calibration interval

Recalibration is recommended every 8 years. Contact the manufacturer or an accredited laboratory for calibration.

16.5 Firmware update

A firmware update of the basic device and the module can be done:
· Via the measurement device homepage of the basic device (menu *Settings -> Firmware update* - see usage information for the basic device).
· Via the firmware update wizard of the GridVis software:
  - Open the Firmware Update Wizard in the GridVis software by clicking *Update device* in the *Extras* menu.
  - Select a corresponding update file and carry out the update.

INFORMATION

This user manual describes the modules and provides information on the operation of the modules via the basic device.

In addition to this user manual, refer to the usage information for your basic device, such as:
· User manual
· Installation manual
· Safety instructions
· Data sheet

In addition, also note any special usage information for your application/project!

Furthermore, the GridVis software has an online help feature.

16.6 Procedure in the event of a malfunction

ATTENTION

An error in the communication with the basic device leads to a device fault!
If communication from the basic device to the modules is lacking or faulty during operation, a warning signal will appear on the display of the basic device.
Prior to dismounting or disconnecting the modules of the basic device (the system)
· **Disconnect the supply of power! Secure it against being switched on again! Check to be sure it is de-energized! Ground and short circuit! Cover or block off adjacent live parts!**
· **Prior to remounting, it may be necessary to restart the basic device!**
· **Also take note of the chapter "Procedure in the event of a malfunction" in the documentation of your basic device!**
· **If the measures indicated here are unsuccessful, please contact our support team (www.janitza.com)!**
· **If there is discernible damage, send the device, component or module back to the manufacturer in compliance with proper transport conditions.**

16.7 Reset to factory settings

The *Reset to factory settings* function must be carried out via the basic device.
A description of this can be found in the user manual for the basic device.

16.8 Information on saving measured values and configuration data

INFORMATION

The basic device stores the following measured values every 5 minutes at the latest:
· Min. / max. / average values
· Energy values (work values)
The basic device saves configuration data immediately.

Janitza

Janitza electronics GmbH
Vor dem Polstück 6 | 35633 Lahnau
Germany

Tel.: +49 6441 9642-0
info@janitza.com | www.janitza.com

Doc. no. 2.053.311.1.b | 10/2026 | Subject to technical changes.
The current version of the document can be found in the download area at www.janitza.com.