

Mobile energy data collector

GridVis[®] Collector

User Manual (firmware 2.0.0 and higher)



Janitza electronics GmbH
Vor dem Polstück 6
D-35633 Lahnau
Support Tel. +49 6441 9642-22
Fax +49 6441 9642-30
Email: info@janitza.de
<http://www.janitza.de>

Janitza[®]

GridVis® Collector User Manual Portable energy data collector

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The German version is the original version of the documentation

NOTE

Please note that certain functions of the GridVis® Collector, such as WLAN, may be restricted or deactivated by country-specific regulations!

Subject to technical changes

The contents of our documentation have been compiled with the greatest care and attention and reflect the current state of information available to us. Nonetheless, we would like to point out that updates of this document are not always possible at the same time as technical refinements are implemented in our products. Information and specifications are subject to change at any time. Please see our website at www.janitza.de for the current version.



Table of contents

1. General	6	3. Safety	18
1.1 Disclaimer	6	3.1 Display of warning notices and safety information	18
1.2 Copyright notice	6	3.2 Hazard levels	18
1.3 Technical changes	6	3.3 Product safety	19
1.4 About this user manual	6	3.4 Fundamental hazards	19
1.5 Defective device/disposal	7	3.5 Hazards when handling the device and the lithium-ion battery	20
2. Product description	8	3.6 Qualified personnel	24
2.1 Device description	8	3.7 Warranty in case of damage	24
2.2 Firmware 2.0.0	9	4. Design of the device	26
2.2.1 Compatible devices for readout via Ethernet	9	4.1 Location of connections and controls on the GridVis® Collector	26
2.2.2 Compatible devices for read out via USB/RS-485 converter	9	4.2 Housing of the GridVis® Collector	28
2.2.3 Compatible devices for read out via an Ethernet gateway (master device)	9	4.3 Transport case for the GridVis® Collector	30
2.3 Initial commissioning	9	5. Controls and display elements, operating modes	32
2.3.1 Authentication	11	5.1 Power supply	32
2.4 Scope of delivery	12	5.2 Ethernet interface	34
2.5 Intended use	14	5.3 USB port	34
2.6 EC Declaration of Conformity	14	5.3.1 USB/RS-485 converter	35
2.7 Performance characteristics	15	5.4 Switching the GridVis® Collector on and off	36
2.8 Identification of the device, rating plate	16	5.5 Operating modes	38
		5.6 Menu structure	40
		5.7 Start screen	42

6. Commissioning and initial configuration	46	7.7 Main menu item "Settings"	97
6.1 Installing GridVis plug-ins in the GridVis software from the enclosed USB flash drive	46	7.7.1 LCD brightness	98
6.2 Configuring the GridVis® Collector in the GridVis software	50	7.7.2 Time zone	98
6.3 Assigning measurement devices to the GridVis® Collector in the GridVis software	54	7.7.3 Language	99
6.4 Transferring a GridVis software project to the GridVis® Collector	60	7.8 Main menu item "Network"	100
6.5 Integration of RS-485 measurement devices	68	7.8.1 Ethernet	100
6.6 Secure data communication	72	7.8.2 WLAN	101
6.7 Windows firewall	76	7.8.3 Server	103
7. Operation	78	7.9 Main menu item "System"	104
7.1 Reading out measured values	78	7.9.1 Function of "Reset" button	104
7.2 Reading out measured values from RS-485 measurement devices	82	7.9.2 Function of "Update" button	106
7.3 Synchronizing measured values with the GridVis software database	84	7.9.3 Function of "Log" button	108
7.4 Integrating plug-ins in the GridVis system service	88	8. Clock/Battery	109
7.5 Configuration of the automatic start of the Collector Receiver as of the GridVis "Service" edition	89	8.1 Clock	109
7.6 Importing new measurement devices into the GridVis® Collector	92	8.2 Battery	109
		9. Technical data	110
		10. Maintenance and care	114
		10.1 Maintenance	114
		10.2 Care	114

1. General

1.1 Disclaimer

Compliance with the informational products for the device is a prerequisite for safe operation and for attaining the stated performance characteristics and product features. Janitza electronics GmbH accepts no liability for personal injury, material damage or financial loss resulting from disregard of the informational products. Ensure that your informational products are legible and accessible.

1.2 Copyright notice

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Any duplication, processing, distribution or other use, 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 matches the user manual.
- First read and understand the documents accompanying the product.
- Keep the documents accompanying the product available throughout its entire service life and pass them on to any possible subsequent users.
- Find out about device revisions and the associated modifications to the product documentation at www.janitza.de.

1.4 About this user manual

If you have any questions, comments or suggestions for improvement regarding the user manual, please let us know by email at info@janitza.de

NOTE

Please note:
The screenshots of the GridVis Collector and the GridVis software shown here in the user manual may differ from the actual screens! This is due, among other things, to changing firmware and software versions.

1.5 Defective device/disposal

Please send **defective devices** back to the manufacturer for testing (complete with carrying case and accessories). **Do not try to replace the battery on your own, as this will invalidate the warranty! Please note the following in this regard:**

- Before transport, discharge the battery!
- Observe the shipping instructions for devices with a lithium-ion battery;
 - Air freight (IATA): Shipping according to VA967 Part II.
 - Road (ADR/RID): Shipping according to SV188.

NOTE

For lithium-ion batteries and devices with lithium-ion batteries, especially in the case of **known mechanical damage** to the batteries, extensive and complicated legal regulations apply for the shipper!
In the case of a battery in your GridVis® Collector that is known to be mechanically damaged, please inform Janitza electronics GmbH. We will promptly send you a special box for dangerous goods and the corresponding warning labels for identification.
Return the device with a damaged battery, complete with carrying case and accessories, in the special box for hazardous goods to Janitza electronics GmbH.

NOTE

Please return defective or damaged GridVis® Collectors to Janitza electronics GmbH, observing the shipping instructions for air freight and road transport (complete with carrying case and accessories).

Also send devices whose lithium-ion battery life has been exceeded back to Janitza electronics GmbH.

NOTE

Observe the information and safety instructions for the device and lithium-ion batteries in the section „3. Safety“ on page 18.

For the **Disposal** of the device please observe national regulations! Dispose of individual parts, if necessary, depending on their composition and existing country-specific regulations, e.g. as

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

or engage a certified disposal company to handle scrapping.

2. Product description

2.1 Device description

The GridVis® Collector

- **is a powerful mobile readout device for all compatible Janitza measurement devices;**
- **increases the connectivity of the GridVis® software.**

Usually, measurement devices in the GridVis® software are connected via interfaces such as Ethernet, RS-485 or modem. In cases where such connections are not possible, the GridVis® Collector is used.

With the GridVis® Collector you can read out measurement data from a Janitza measurement device on site, e.g. at a transformer station. Then you can easily synchronize the measurement data with the GridVis® database in your company.

The large storage capacity the GridVis® Collector provides means measurement devices that store measurement data according to EN50160 or EN61000-2-4 can also be read out.

No specialized knowledge of the GridVis® network visualization software is needed to operate the mobile GridVis® Collector on site. An intuitive, capacitive 7" multi-touch colour display with transparent menu navigation ensures that the devices can be used with minimal training for users/fitters.

Synchronization of the measurement data with the GridVis database is done via WLAN or Ethernet. The GridVis® Collector supports GridVis projects with JANDB, MSSQL or MYSQL databases.

In the GridVis® software you can easily synchronize measurement devices with the measurement data collected by the GridVis® Collector. Integration of the GridVis® Collector into the GridVis® software requires a one-time configuration of the Collector using the GridVis plug-ins included in the scope of delivery.

With a basic knowledge of the GridVis® software, users can carry out the integration on their own. If desired, we can also carry out the integration during the installation of the GridVis® software or in a separate appointment.

2.2 Firmware 2.0.0

As of firmware 2.0.0, the GridVis® Collector can also read RS-485 devices. For this purpose, the GridVis® Collector includes a USB to RS-485 converter (USB/RS-485 converter tested by Janitza – part no.: 15.06.107).

2.2.1 Compatible devices for readout via Ethernet

UMG 604, UMG 605, UMG 508, UMG 509, UMG 511, UMG 512, UMG 96 RM-E and the respective Pro devices.

2.2.2 Compatible devices for read out via USB/RS-485 converter

UMG 103-CBM, UMG 96 RM-CBM, UMG 96-PA.

2.2.3 Compatible devices for read out via an Ethernet gateway (master device)

UMG 103-CBM, UMG 96 RM-CBM, UMG 96-PA.
In a master/slave topology, you can read out these devices using the UMG 604, UMG 605, UMG 508, UMG 509, UMG 511, UMG 512 or UMG 96 RM-E master devices and the respective PRO devices.

NOTE

The GridVis® Collector **does not** read the UMG 96 RM-CBM via the USB port! The UMG 96 RM-CBM is read out via the RS-485 interface!

2.3 Initial commissioning

The initial commissioning is carried out according to the following scheme:

- Installation of the GridVis plug-ins contained on the supplied USB flash drive in the GridVis® software.
- Configuration of the IP addresses in the GridVis® software.
- Configuration of the measurement devices in the GridVis® software.
- Save the initial configuration on the USB flash drive.
- Insert the USB flash drive into the GridVis® Collector. The GridVis® Collector recognizes the USB flash drive and saves the configuration.

The initial configuration (see „6. Commissioning and initial configuration“ on page 46) with all relevant GridVis parameters, such as the GridVis project, is delivered to the GridVis® Collector via the USB flash drive.

After the initial configuration of the GridVis® Collector, the configuration of further measurement devices or changes of IP addresses is done directly on the GridVis® Collector.

A configuration of the GridVis® Collector via the USB flash drive is only necessary after

- a reset to the factory settings or
- a change of the project name;
- transfer of a new RSA key pair;
- transfer of new device pages (GridVis device tree).

As of firmware 2.0.0, a GridVis® Collector manages up to 500 measurement devices. For further measurement devices, you must configure several GridVis® Collectors in your GridVis project.

NOTE

Please note!

The GridVis® Collector does not store large amounts of data, e.g. records of 500 measurement devices according to EN50160 or EN61000-2-4!

Transfer the contents of your GridVis® Collector memory to a PC or server with the GridVis software installed in good time and regularly.

NOTE

Only configure one GridVis project per GridVis® Collector!

The GridVis® Collector has:

- An internal, UN38.3 certified lithium-ion battery (rechargeable battery) with a runtime of up to 9h*. Charge the battery of your GridVis® Collector with the USB charger via a USB charging cable (USB to mini-USB connector).
- An internal battery-backed clock, which is synchronized via the Network Time Protocol (NTP)

*Battery life depends on the intensity of the backlight, the age and the respective use of the battery.

2.3.1 Authentication

As of firmware 2.0.0, the communication between the GridVis® Collector and the PC/server (with installed GridVis software) can be encrypted optionally.

Authentication and encryption are done using an RSA key with a length of 1024 bits.

2.4 Scope of delivery

Fig.:
GridVis® Collector
scope of delivery



Item	Part no.	Designation
1	29.01.101	Transport case (W x H x D: 464 mm x 176 mm x 366 mm, automatic pressure valve, water-proof, dust-proof, IP67 certified)
2	51.00.400	Energy data collector "GridVis® Collector"
3	34.02.001	USB charger (power supply: input: 100-240 V, 50-60 Hz, 0.7 A, output: 5 VDC, 2.4 A)
4	08.02.445	USB charging cable (USB to mini-USB connector)
5	08.01.505	Ethernet cable (cross-patch cable), 2 m
	15.06.107	USB/RS-485 converter
6	33.03.223	User manual
7	32.01.032	USB flash drive with GridVis plug-ins
	52.00.008	Termination resistor

Table: GridVis® Collector scope of delivery

2.5 Intended use

Use the device in operation at ambient temperatures of 0 to 40 °C (32-104 °F). Temperatures outside this range can lead to impairments of the device! Please refer to section „**3. Safety**“ on page 18.

The storage temperature range is -10 to 45 °C (14-113 °F).

For information on defective devices, see „1.5 Defective device/disposal“ on page 7.

Do not connect your device to a power socket or, for example, to a USB plug in a car for charging. Only use USB power supply units authorized by Janitza electronics GmbH to charge your device.

In this regard, please observe section „3.7 Warranty in case of damage“ on page 24.

Safe and trouble-free operation of the device requires proper transport, storage, installation, operation and maintenance.

Observe the safety information and technical specifications for the device with integrated rechargeable battery (charger) presented here in the user manual and in the enclosed documents.

2.6 EC Declaration of Conformity

The EC Declaration of Conformity and the accompanying **CE marking** indicate that Janitza electronics GmbH has manufactured the device in accordance with the directives and standards that exist for the device.

The laws, standards and directives applied by Janitza electronics GmbH for the device can be found in the EC Declaration of Conformity at **www.janitza.de**.

The GridVis® Collector complies with the EMC directive (Electromagnetic compatibility of equipment – 2014/30/EU).

Standards taken into account

- 2014/30/EU Electromagnetic compatibility of equipment

Emissions

- EN 55011:2011 Group 1 Class A

Immunity from interference

- IEC 61000-4-2:2009 Discharge of static electricity
- IEC 61000-4-3:2011 Electromagnetic RF field (80-2700 MHz)

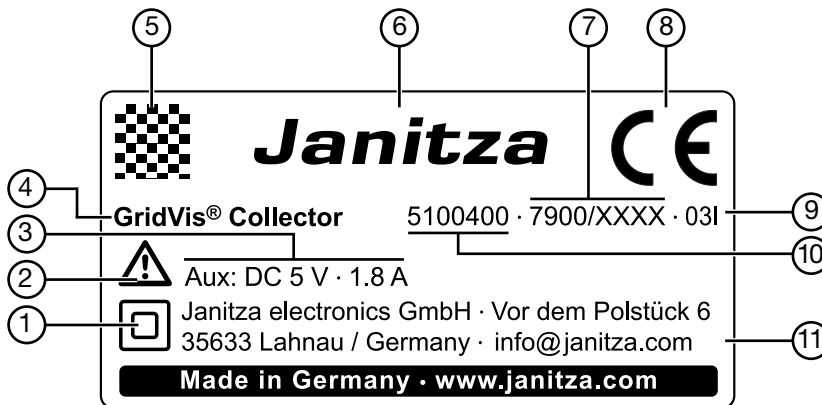
- IEC 61000-4-4:2013 Fast transients
- IEC 61000-4-6:2009 Conducted RF disturbance, 0.15-80 MHz

2.7 Performance characteristics

- 60 GByte data memory to read out up to 500 measurement devices (depending on the recording configuration).
- 7" capacitive multi-touch colour display.
- Viewing angle, 140 degrees horizontal, 130 degrees vertical.
- Luminosity 250 cd/m².
- Lithium-ion battery 3350 mAh certified according to UN Transport Test UN38.3.
- Up to 9 hours running time.
- Ethernet connection 100Base-TX.
- USB 2.0.
- Mini-USB charging port according to USB-BC 1.2.
- WLAN.
- Encryption: Open, WEP, WPA2 (with CCMP and TKIP support).
- Authentication: PEAP (with MSCHAPv2), TLS, TTLS.
- Encrypted communication via RSA keys between the GridVis® Collector and the GridVis PC/server.
- Readout of devices with RS-485 interfaces via USB/RS-485 converter.
- Dimensions GridVis® Collector (WxHxD): 270 mm x 247 mm x 91 mm.
- Material: ASA+PC-FR (UL 94 V-0).
- Operating temperature range: 0-40 °C (32-104 °F).
- Net weight: 1260 g.
- IP20 according to EN60529.
- As of GridVis software edition "Professional" and as of version 7.2.103.
- Memory readout via Ethernet: UMG 604, UMG 604-PRO, UMG 605, UMG 605-PRO, UMG 508, UMG 511, UMG 512, UMG 512-PRO, UMG 96 RM-E.
- Memory readout via RS-485: UMG 103-CBM, UMG 96RM-CBM, UMG 96-PA.
- Memory readout via Ethernet gateway: UMG 103-CBM, UMG 96RM-CBM, UMG 96-PA.
- Possible gateways (master devices): UMG 604, UMG 604-PRO, UMG 605, UMG 605-PRO, UMG 508, UMG 511, UMG 512, UMG 512-PRO, UMG 96 RM-E.

2.8 Identification of the device, rating plate

Fig.:
Rating plate



Item	Designation	Description
1	Symbol for "Protection class II"	The device has reinforced or double insulation in the amount of the rated insulation voltage between live and touchable parts (VDE 0100 Part 410, 412.1).
2	Symbol for "Danger sign"	General warning symbol. Observe the warnings shown on the device and listed in the documents to avoid possible injury or even death.
3	Operating data	Supply voltage and current.
4	Device type	Device designation.
5	QR code	Coded manufacturer data.
6	Manufacturer's logo	Logo of the device manufacturer.
7	Serial number	Number to identify the device.
8	CE marking	See section „2. 6 EC Declaration of Conformity“ on page 14.
9	Manufacturer-specific data	Date of manufacture (coded).
10	Part number	Part number of the manufacturer.
11	Manufacturer's address	Address data of the manufacturer.

Table: Identification of the device, rating plate

3. Safety

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

3.1 Display of warning notices and safety information

The warning notices shown below

- are used throughout the documentation;
- are on the devices themselves;
- indicate potential risks and dangers;
- underscore aspects of the information provided that clarify or simplify procedures.



The additional symbol on the device itself indicates an electrical hazard that can result in serious injury or death.



The 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.

3.2 Hazard levels

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



Indicates an imminently hazardous situation which, if disregarded, will result in serious injury or death.



Indicates an imminently hazardous situation which, if disregarded, can result in serious injury or death.



Indicates an imminently hazardous situation which, if disregarded, can result in minor injuries.

ATTENTION

Indicates an imminently hazardous situation which, if disregarded, can result in property damage or environmental damage.

NOTE

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

3.3 Product safety

The device reflects current engineering practice and accepted safety standards, but hazards can arise nonetheless.

Only operate the device when it is in perfect condition and in compliance with this user manual and the associated, included documents.

First read and understand these instructions and familiarize yourself with the device before installation, operation and maintenance.

Do not try to change the lithium-ion battery of the device on your own! Send defective devices back to the manufacturer complete and in the carrying case and observe the transport conditions.

3.4 Fundamental hazards

When operating electric devices, certain parts of these devices can conduct hazardous voltage. Consequently, material damage and personal injury including death can occur if they are not handled properly. Therefore, when handling our devices, always observe the following:

- Do not exceed the limit values specified in the user manual and on the rating plate; this must also be observed during testing and commissioning.
- Observe the safety and warning notices in the documents accompanying the devices.

3.5 Hazards when handling the device and the lithium-ion battery

Lithium-ion batteries are considered to be safe when treated and handled properly, but certain uses give rise to potential hazards, such as:

- Technical defects (e.g. deep discharge due to overaged batteries, unsuitable or defective battery chargers).
- Shock (e.g. a fall), wilful destruction or manipulation of the battery.
- Chemical compounds which can cause high temperatures in connection with an uncontrolled discharge.

Observe the following warnings when handling the device and the lithium-ion battery:



WARNING

Warning against contact of the device with moisture, water, fire, explosions, oils, acids, alkalis, gases, vapours, dust and radiation!

This can lead to a chemical reaction and to a defect of the device (material damage), or even personal injury in case of fire or explosion.

- Protect the device from the above-mentioned substances and use the transport case for storage.
- Store and transport the device within the temperature range of -10 to 45 °C (14-113 °F).

Recommendation:

For a long service life, store the device at 22 to 28 °C (71-82 °F) in a dry environment!



WARNING

Warning against disregarding the temperature range of the device.

Storage and operation outside the temperature range of the device can cause a defect of the device (material damage, temperatures below -10 °C/14 °F), or even fire or explosion (personal injury, temperatures above 45 °C/113 °F).

- Comply with the specified temperature limits for storage and operation of the device (battery)! Also see the section "Technical data".

 **WARNING****Warning against unauthorized manipulation of the device or the lithium-ion battery.**

Opening and disassembling the device or the integrated battery can damage the device, e.g. due to a leaking battery, or in the worst case, can lead to fire or explosion.

- Do not short-circuit or bridge the contacts of the device/battery!
- If the device/battery is damaged, return the device to the manufacturer, observing the proper transport conditions. See „1. 5 Defective device/disposal“ on page 7.

 **WARNING****Warning of heat generation when charging the device (battery).**

The heat generated when charging the device (battery) on flammable materials and surfaces (e.g. wood, carpet, etc.), can lead to fire and thus to material damage and personal injury or even death!

- Charge your device on heat-resistant surfaces.
- Do not allow the device to charge while unattended!
- Only use chargers authorized by the manufacturer for charging.
- After charging, disconnect your USB charger from the mains.

 **WARNING****Warning against misuse of the device, accessories and battery, including during charging.**

Use of the device by unauthorized persons, especially during charging, e.g. by children or pets, can lead to damage to property and personal injury or even death!

- Make sure that your device, accessories and especially the battery (also during charging) are inaccessible to unauthorized persons (e.g. children) and pets!

 **WARNING****Warning against storing the device near heat sources.**

Depositing or storing the device near heat sources, e.g. ovens, heaters, in vehicles (on hot days) etc., can lead to fire and thus to material damage and personal injury or even death!

- Always use the transport case to store the device.
- Observe the specified temperature limits for storage! See the section „9. Technical data“ on page 110.
- Observe the information for maintenance and care of the device.

**WARNING****Warning against danger of tripping and falling due to cables hung or routed loosely!**

During commissioning and operation of the device, loosely hanging or routed cables (e.g. Ethernet or charging cable of the device) cause a danger of tripping and falling for persons. This can lead to serious injuries or even death!

- Always use your device and cables in such a way that they do not obstruct the movement of persons!
- If necessary, place warning signs before beginning commissioning and do not remove them until the readout process is complete!

ATTENTION**Warning against shock (e.g. a fall) or wilful destruction of the device.**

Shocks, falls or wilful destruction of the device can lead to material damage and environmental damage (e.g. leaking battery).

- Always use the carrying case for storing and transporting the device.
- Check the device and accessories regularly for damage (cables, plugs, housing) before use.
- Do not use defective chargers.
- If the device/battery or accessories are damaged, return the device to the manufacturer, observing the proper transport conditions. See section „1. 5 Defective device/disposal“ on page 7.

ATTENTION**Warning against unauthorized use and storage of the device in microwave ovens or in areas exposed to electromagnetic radiation.**

High-frequency electromagnetic fields can damage the device.

- Use your device only in permitted areas. Please observe the information and technical specifications in the user manual!

ATTENTION**Material damage due to incorrect maintenance of the GridVis® Collector.**

The use of water or other solvents, such as denatured alcohol for the display, can damage or destroy the device, display and accessories during cleaning. Water can penetrate into the device housing and destroy the device, for example.

- Before cleaning the device, disconnect the mains adapter from the power supply and discharge the battery.
- Clean the housing, the display and accessories, especially the power supply unit, of the GridVis® Collector only with a dry microfibre cloth.
- If the housing or accessories are very dirty, use a microfibre cloth moistened with clear water.
- Clean the display, e.g. of fingerprints, with a special LCD cleaner and a lint-free microfibre cloth.

NOTE

For air travel, completely discharge the battery of the device. Please note the following:

- The battery capacity indicator on the display must be "0". The device display goes out.
- Only transport the device in the supplied transport case.
- The regulations for air freight (IATA): Shipping according to VA967 Part II.

3.6 Qualified personnel

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

- the national and international accident prevention regulations,
- safety engineering standards so as to identify risks and avoid possible hazards,
- installation, commissioning, operation and maintenance of the device,
- national and international laws, regulations and standards.



Warning against improper use of the device!

- If the device is not operated in accordance with the documentation, protection is not ensured and damage to property or injury or even death may occur.
- Any unauthorized manipulation or use of the device beyond the specified mechanical, electrical or other operating limits may result in damage to property or injury or death.

This device is to be installed, operated and maintained exclusively by qualified personnel with electrical training and experience.

3.7 Warranty in case of damage

Any unauthorized manipulation or use of the device constitutes "misuse" and/or "negligence" under the product's warranty and therefore voids the warranty with respect to the coverage of any possible resulting damage. In this regard, please note section „2. 6 EC Declaration of Conformity“ on page 14.

4. Design of the device

4.1 Location of connections and controls on the GridVis® Collector



Fig.: Connections and controls

Item	Designation	Description
1	Display	7" capacitive multi-touch colour display
2	WLAN	Integrated antenna (inaccessible from the outside)
3	On/off button	<ul style="list-style-type: none"> · Switches the device on and off (press the button briefly each time). · Reset of the device (press and hold button approx. 10 sec.). Only perform a reset in an emergency and after instruction by the manufacturer!
4	Status LED	Display of the operating modes: <ul style="list-style-type: none"> · Green – device in operation. · Blue – device in charging state, battery is full. · Red – device in charge state. · Orange – device is shutting down. · Yellow – charge/timeout.
5	Mini-USB charging port	Connection for charging the device (rechargeable battery): <ul style="list-style-type: none"> · Mini-USB connector USB-BC 1.2. · Charging current 1.5 A at 5 V.
6	USB 2.0 port	Port for initial commissioning and the USB/RS-485 converter.
7	Ethernet connection	<ul style="list-style-type: none"> · 100Base-T. · Status indication on the display "Ethernet cable connected".

Table: Connections and controls on the GridVis® Collector

**WARNING****Warning against damage when charging the device (battery).**

The use of unauthorized chargers can lead to fire and thus to material damage and personal injury, even death.

- Charge your device on heat-resistant surfaces.
- Do not allow the device to charge while unattended!
- Only use chargers authorized by the manufacturer for charging.
- After charging, disconnect your USB charger from the mains.

4.2 Housing of the GridVis® Collector

The housing consists of:

- High-quality plastic ASA+PC+FR (UL 94 V-0) with high impact resistance.
- A handle with finger recesses for a secure grip during use.
- 2 rubber studs on the underside of the device for a stable stance.

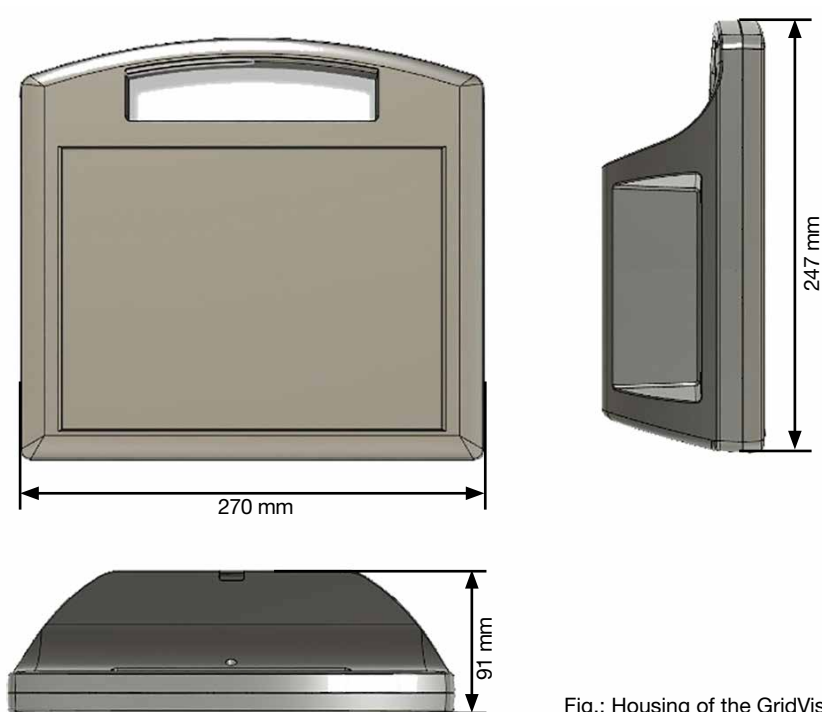


Fig.: Housing of the GridVis® Collector

4.3 Transport case for the GridVis® Collector

The transport case ensures the safe transport of the GridVis® Collector and protects it from moisture, sunlight and shocks. Furthermore, the transport case prevents the GridVis® Collector from being accidentally switched on.

Features of the transport case:

- Waterproof
- Dust-proof
- IP67 certified
- Automatic pressure compensation valve
- Dimensions WxHxD:
464 mm x 176 mm x 366 mm

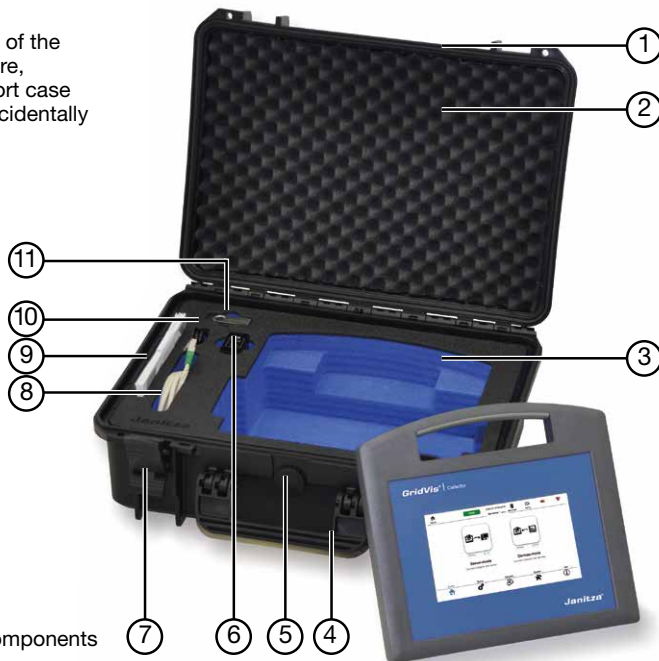


Fig.: Transport case and components

Item	Designation
1	Seal
2	Inlay in case lid.
3	2-coloured inlay with recess for the GridVis® Collector.
4	Carrying handle
5	Pressure compensation valve
6	Recess for USB charger (power supply unit).
7	Latches
8	Recess for Ethernet cable and USB/RS-485 converter.
9	Recess for informational products.
10	Recess for USB charging cable.
11	Recess for USB flash drive with GridVis plug-ins.

Table: Components of the transport case for the GridVis® Collector

5. Controls and display elements, operating modes

5.1 Power supply

The GridVis® Collector has a permanently integrated lithium-ion battery. Please observe the warnings and safety information in section „3. Safety“ on page 18.

The battery at delivery has a charge of about 60%. Please fully charge the battery before the first use! Only use chargers (power supplies) authorized by the manufacturer for charging.

Connect the charger (power supply) to the GridVis® Collector for charging. Use the charging cable (USB 2.0 to mini-USB) included in the scope of delivery.

The GridVis® Collector charges with an average of 1.5 A. One charging cycle takes about 5 hours. An RGB LED indicates the charging status (operating mode). The colours have the following meanings:

- Blue LED – charging process completed. The battery of the GridVis® Collector is fully charged.
- Red LED – The battery is charging.

For further LED statuses (operating modes), see section „4. 1 Location of connections and controls on the Grid-Vis® Collector“ on page 26.

NOTE

- An internal charge controller automatically ends the charging process once the battery is fully charged. Recommendation: Observe the charging process and disconnect the charger (power supply unit) from the power when fully charged.
- Leave the GridVis® Collector switched off during the charging process.
- Prolonged non-use of the GridVis® Collector can shorten the battery life.

ATTENTION

Damaged battery cells due to deep discharge!

Deep discharge can destroy the battery of the GridVis® Collector. Even if the GridVis® Collector is not used, the battery can still be deeply discharged due to self-discharge.

- Despite deep discharge protection (the battery switches off at a charge status of 1%), do not leave the GridVis® Collector in the deep discharge protection state for more than 2 months, as the internal battery management system (BMS) consumes power even in the idle state.
- If you do not use the GridVis® Collector for a longer time, leave a remaining capacity of 40-60% in the battery (extends the battery life).
- Check the battery capacity at shorter intervals (<2 months) and charge the battery if necessary.

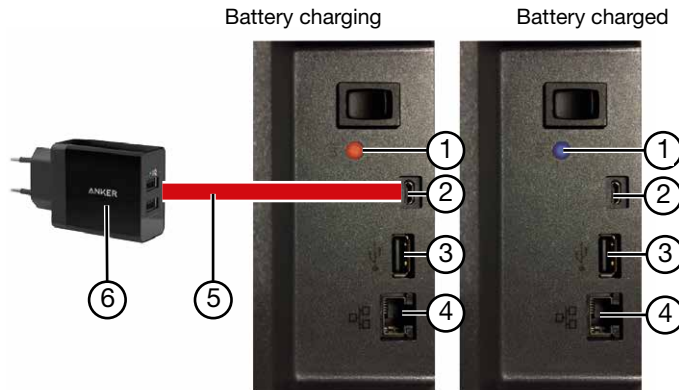


Fig.:
Power supply,
display elements
and interfaces

Item	Designation
1	Status LED <ul style="list-style-type: none"> · Blue: Battery fully charged. · Red: Battery is charging. For additional LED statuses (operating modes), see section „4. 1 Location of connections and controls on the GridVis® Collector“ on page 26.
2	Mini-USB charging port
3	USB 2.0 port
4	Ethernet interface
5	USB charging cable (USB to mini-USB connector)
6	Charger (power supply unit)

Table: Battery power supply

5.2 Ethernet interface

The GridVis® Collector has a **100Base-T Ethernet interface** (see figure on „Fig.:

Power supply, display elements and interfaces“ on page 33, item 4). A suitable Ethernet cable (cross-patch) for reading out the measurement devices on site is included in the scope of delivery.

The **Ethernet interface** has no LED display. The display shows the connection status with the following symbols:



Display symbol	Meaning
 192.168.5.200	<ul style="list-style-type: none"> · Ethernet cable is missing. · No connection to the network/measurement device.
 192.168.5.110	<ul style="list-style-type: none"> · Connection to the network/measurement device.

Table: "Ethernet interface" display status

5.3 USB port

The GridVis® Collector has a **USB 2.0 port** (see figure on „Fig.:

Power supply, display elements and interfaces“ on page 33, item 3). The USB 2.0 port is used to transfer parameters when the GridVis® Collector is first commissioned and to connect the USB/RS-485 converter.

ATTENTION

The use of USB/RS-485 converters from other manufacturers can lead to communication errors or material damage!

The use of third-party USB/RS-485 converters can lead to a significantly higher current draw by the GridVis® Collector and thus lead to communication errors or destruction.

- For data transmission via RS-485 interfaces, use only the USB/RS-485 converter (part no.: 15.06.107) included in the scope of delivery for the connection to the GridVis® Collector!
- If the USB/RS-485 converter is lost, please purchase a new one from Janitza electronics GmbH and include the part number in the order.

5.3.1 USB/RS-485 converter

The scope of delivery of the GridVis® Collector includes the USB/RS-485 converter with a length of 1.8 m (part no.: 15.06.107). The cable length can be extended up to 20 m if required:

Fig.:
USB/RS-485 converter



Connect your USB/RS-485 converter cable to terminals A and B of the RS-485 interface of your measurement device (UMG 103-CBM, UMG 96RM-CBM or UMG 96-PA) with a termination resistor (120Ω), observing the cable lead assignments.

Lead assignment	RS-485 interface on the UMG
"Yellow" lead	Terminal A of the RS-485 interface of the measurement device
"Orange" lead	Terminal B of the RS-485 interface of the measurement device

ATTENTION

Communication errors/malfunctions between the GridVis® Collector and the measurement device!

Omitting a termination resistor when connecting a device via the USB/RS-485 converter results in communication errors or data transmission errors!

- Also connect a termination resistor (120Ω - part no. 52.00.008) between terminals A and B of the RS-485 interface of your measurement device using the USB/RS-485 converter cable!

You can monitor the communication between the measurement device and the GridVis® Collector:

- Red LED (query of the measurement device) and
- Green LED (Sending data from the UMG to the GridVis® Collector).

Technical characteristics:

- FTDI chip
- Baud rate 9600, 19200, 38400 and 115 kBaud
- Stop bits 1 or 2
- Parity: EVEN, NONE, UNEVEN
- -40 °C to 85 °C operating temperature range
- ESD protection
- +/- 15 kV Human Body Model (HBM) +/- 15 kV EN61000-2-4 Air Gap Discharge +/- 8 kV EN61000-2-4 Contact Discharge
- RoHS compliant

5.4 Switching the GridVis® Collector on and off

Use the push-button switch (item 1 in Fig. "Switching the GridVis® Collector on and off") to switch on the GridVis® Collector. When doing so, press the push button **briefly!**

Switching on - Initialization

The green status LED (item 2) indicates the switched-on status. The GridVis® Collector starts a system initialization after power-on.

Switching off - Shutdown

When switching off, press the push button (item 1) and the status LED will change to orange. The GridVis® Collector backs up its data and shuts down. This process takes about **90 seconds**.

Hardware reset function

To perform a hardware reset, hold down the push button (item 1) for 10 seconds.

NOTE

Use the **Hardware reset** only in exceptional cases, e.g. if the GridVis® Collector does not:

- Shut down and switch off!
- Respond to any input!

In this case and for troubleshooting, please contact the manufacturer's Support department.



Fig. Switching GridVis® Collector on and off

Item	Designation
1	Push-button switch
2	<p>Status LED</p> <ul style="list-style-type: none"> · Green: GridVis® Collector is switched on, system initialization is running if necessary. · Orange: GridVis® Collector is shutting down; backs up data and switches off (about 45 seconds). <p>For additional LED statuses (operating modes), see section „4. 1 Location of connections and controls on the GridVis® Collector“ on page 26.</p>

Table: Switching the GridVis® Collector on and off

5.5 Operating modes

The GridVis® Collector has 2 operating modes:

1. Server mode

- The GridVis® Collector synchronizes collected measured values with a GridVis database.
 - The GridVis® Collector loads a device list from a GridVis project.
 - The GridVis® Collector communicates with the GridVis database (server) via WLAN or the Ethernet interface.

2. Device mode

- The GridVis® Collector reads out the memory of measurement devices.
- The GridVis® Collector communicates with the measurement devices via the Ethernet interface or USB/RS-485 converter. Communication via WLAN is not possible.
- The GridVis® Collector synchronizes the time of the devices (planned as of 2019).

Depending on the operating mode, the GridVis® Collector supports different IP ranges and switches them automatically. For example, different IP addresses can be assigned for on-site use (e.g. transformer station) than in the company network (see Fig. Example). The IP

addresses of the measurement devices are configured during initial setup via the **GridVis software plug-in** or directly **on the GridVis®Collector** in the "Ethernet" menu.

The GridVis® Collector supports DHCP, but is **not** a DHCP server!

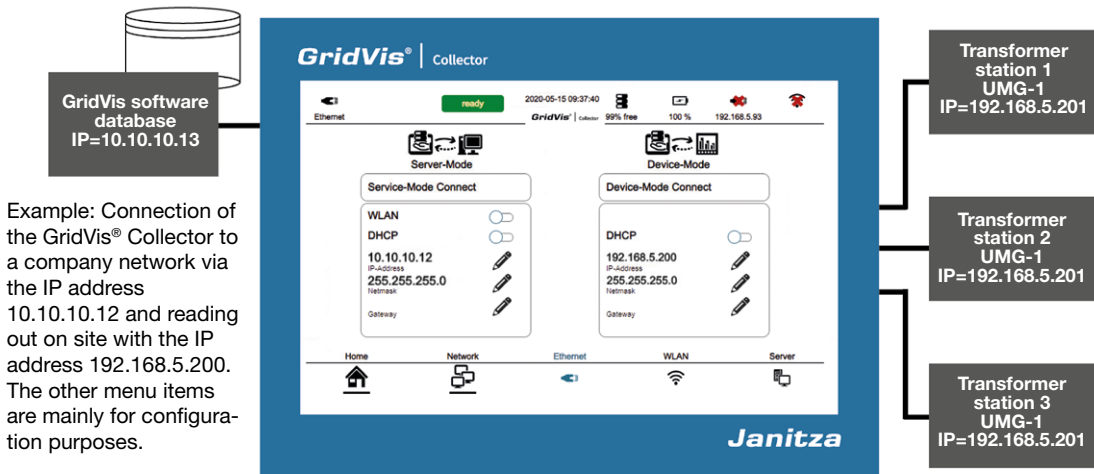
The fixed IP addresses of the measurement devices on site can be selected as required. Change IP addresses for the measurement devices that do not match before reading them out on the GridVis® Collector.

For devices that are connected to a switch on site and have different fixed IP addresses, connect the GridVis® Collector to the switch and read out these devices one after the other.

The GridVis® Collector detects identical IP addresses for measurement devices at different locations when they are connected for the first time ("Binding"). The GridVis®Collector links the serial numbers of the measurement devices with a special GridVis ID. The IP addresses are therefore irrelevant. However, IP address settings on the measurement devices, such as 0.0.0.0 or DHCP (if no DHCP server is available on site) are not permitted!

Fig.: Operating modes -

Example: connection to a network and readout on site (at different transformer stations)



5.6 Menu structure

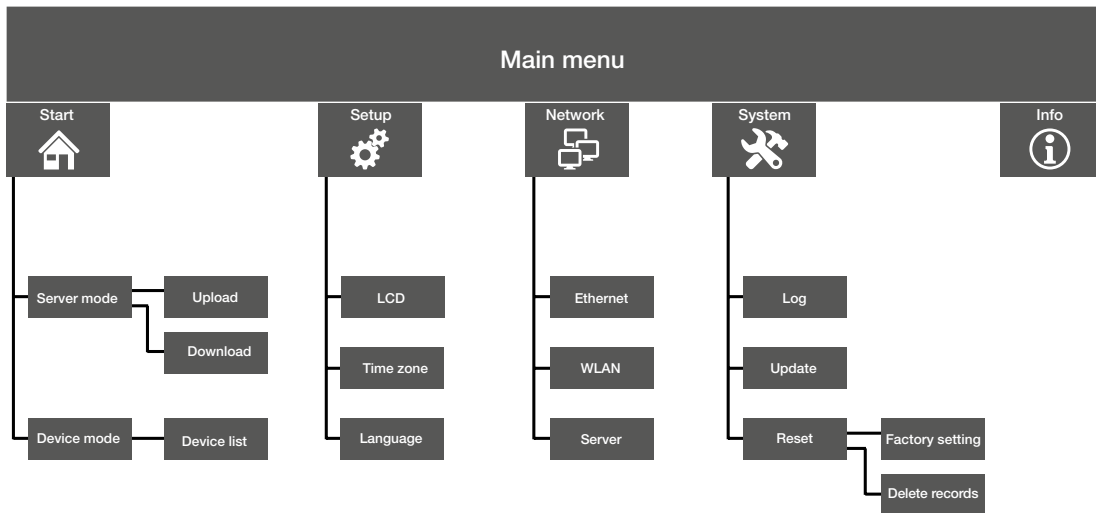


Fig.: Menu structure of the GridVis® Collector

5.7 Start screen

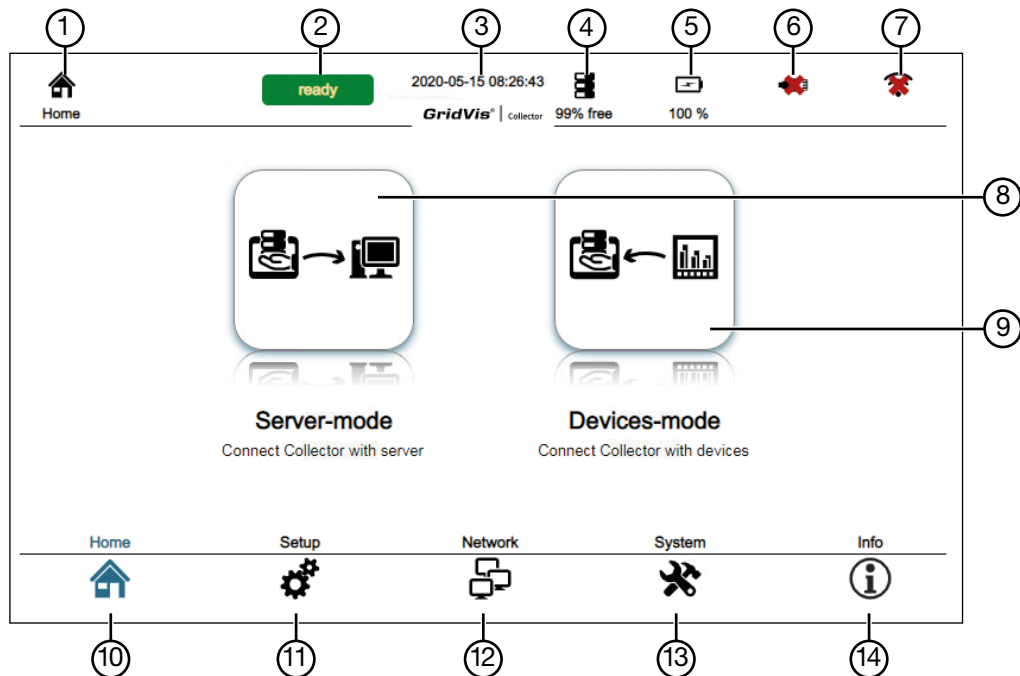


Fig.: Start screen






Item	Symbol	Function	Description
1		"Functional status" display	<ul style="list-style-type: none"> Active function of the main menu (as of item 8).
2		Status display "GridVis® Collector"	<p>Status indicator for "Starting modules" (red):</p> <ul style="list-style-type: none"> Starts and appears automatically when the GridVis® Collector is switched on. The GridVis® Collector loads service modules during the startup process. <p>Status indicator for "Ready" (green):</p> <ul style="list-style-type: none"> Service modules are loaded. Device or USB flash drive ready for readout. Data ready for transmission. All functions of the GridVis® Collector can be used.
3	01.03.2018 12:57:50	Display "Date/Time"	Shows the current date and time of the GridVis® Collector.
4		Display "Storage capacity for measured values"	<ul style="list-style-type: none"> 100% corresponds to 60 GByte of free memory. Synchronize the GridVis® Collector with the GridVis database at the latest when the memory is full (0% free)! Then delete your records (measured values) manually in the "System" menu.
5		Display "Battery capacity status"	<p>Includes 3 warning levels:</p> <ul style="list-style-type: none"> 15% - 1st warning, the symbol changes colour (red). 5% - 2nd warning. 1% - Last warning, then the GridVis® Collector shuts down.
6		Display "Ethernet interface status"	<p>Shows the status of the Ethernet interface:</p> <ul style="list-style-type: none"> Ethernet connection to the server or measurement device with display of the current IP address of the server or on-site measurement device. No Ethernet connection - symbol marked with a red X.

Table: Descriptions for "Start screen and Main menu"









Item	Symbol	Function	Description
7		Display "WLAN interface status"	Shows the status of the WLAN interface: <ul style="list-style-type: none"> · WLAN connection with the server. When the WLAN connection is active, the symbol changes colour (blue). · No WLAN connection - symbol marked with a red X.
8		"Server mode" button	<ul style="list-style-type: none"> · Activates the "Server mode" operating mode
9		"Device mode" button	<ul style="list-style-type: none"> · Activates the operating mode "Device mode"
Item	Symbol	Main menu functions	Description - The symbol of the activated function is shown in blue.
10		"Start" button	<ul style="list-style-type: none"> · Opens the start screen. · Selection of the operating mode.
11		"Settings" button	<ul style="list-style-type: none"> · Opens the "Settings" user interface with settings for the LCD screen, time zone and language.
12		"Network" button	<ul style="list-style-type: none"> · Opens the "Network" user interface with Ethernet and WLAN settings.
13		"System" button	<ul style="list-style-type: none"> · Opens the "System" user interface with log, update and reset settings.
14		"Info" button	Provides information about the functions.

Table: Descriptions for "Start screen and Main menu"

6. Commissioning and initial configuration

Commissioning of the GridVis® Collector requires knowledge of the GridVis software and can be carried out directly by the customer.

Commissioning procedure:

1. Charge the battery of the GridVis® Collector.
2. Install GridVis plug-ins in the GridVis software from the enclosed USB flash drive (section 6. 1 on page 46).
3. Establish a secure connection if required (section „5. 2 Ethernet interface“ on page 34 or section „5. 3 USB port“ on page 34)
4. Configure the GridVis® Collector in the GridVis software (section 6. 2 on page 50).
5. Assign measurement devices to the GridVis® Collector in the GridVis software.
6. Save the configuration on the supplied USB flash drive*.
7. Insert the USB flash drive into the GridVis® Collector
8. Automatic transfer of the configuration via the USB flash drive.

NOTE

- Before the GridVis® Collector is commissioned, the on-site measurement devices should be commissioned using the GridVis software.
- Configuration of the current transformer, records, nominal values and the time cannot be done via the GridVis® Collector.
- The GridVis® Collector is exclusively for reading out measurement devices and synchronizing the measured values with the GridVis database.

6. 1 Installing GridVis plug-ins in the GridVis software from the enclosed USB flash drive

Integrating the GridVis® Collector in the GridVis software (as of the "Professional" edition) requires the plug-ins stored on the USB flash drive.

NOTE

The GridVis plug-ins can be found

- on the USB flash drive and
- on our homepage (www.janitza.de).

Installing the plug-ins in the GridVis software requires GridVis version 7.2.103 or higher!

The USB flash drive contains 3 plug-ins for the installation of the GridVis®Collector.

Plug-in for

1. The configuration of the GridVis® Collector in the GridVis software.
2. Data reception (DataReceiver) and synchronization of the data with the GridVis database (**GridVis software - as of "Professional" edition - manual data reception**).
3. Data reception (DataReceiver) and synchronization of the data with the GridVis database (**GridVis software - as of "Service" edition - automatic data reception - Collector Receiver - via a system service**).
4. Secure communication between the GridVis® Collector and the GridVis software using an RSA key.
5. Data exchange between the plug-ins (internal GridVis® Collector gateway)

For a description of "Integrating plug-ins in the GridVis system service" see section „7. 4 Integrating plug-ins in the GridVis system service“ on page 88.

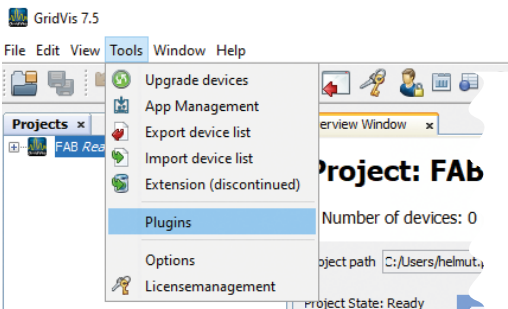
Names of the plug-ins:

1. Collector_configuration_X.X.XX*.nbm
2. Collector_receiver_X.X.XX*.nbm
3. Collector_service_receiver_X.X.XX*.zip
4. Collector_security_provider_X.X.XX*.nbm
5. Collector_gridvis_gateway_X.X.XX*.nbm

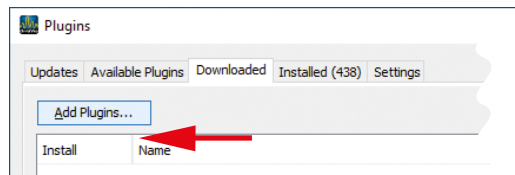
* ... Version number

Step - Install plug-ins

- Click on the "Extras" drop-down menu in the menu bar of the GridVis software.
- Then click on the menu item "Plug-ins".



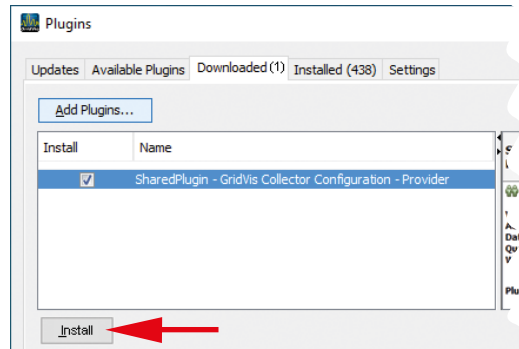
- The "Plug-ins" window appears.



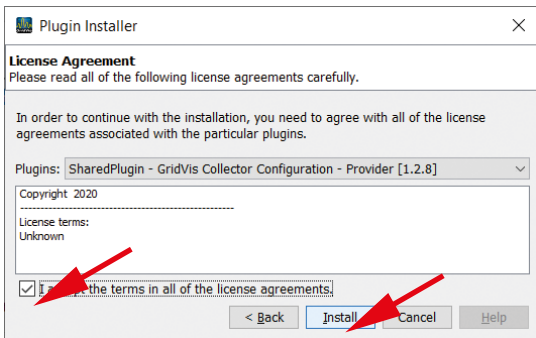
- On the "Downloaded" tab, click the "Add plug-ins" button.
- In the dialog box that appears, select your plug-in (USB flash drive) and click "Open."
- Your plug-in now appears on the "Downloaded" tab.
- Select the checkbox of your plug-in and click the "Install" button.

NOTE

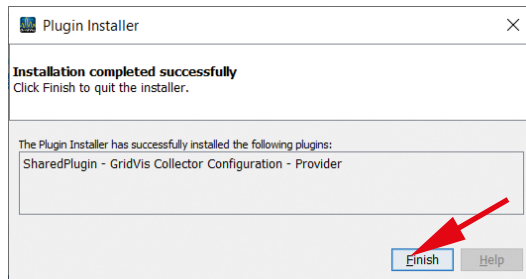
Install plug-ins one after the other!



- The "Installation system for plug-ins" window appears.
- Accept the license agreements by selecting the checkbox and clicking the "Install" button.



- The "Please check the certificate" window appears. Ignore this message by clicking the "Continue" button.
- In the last step of the plug-in installation, click the "Finish" button.



- Proceed in the same way to install additional plug-ins.

After you have installed both plug-ins, restart the Grid-Vis software.

6.2 Configuring the GridVis® Collector in the GridVis software

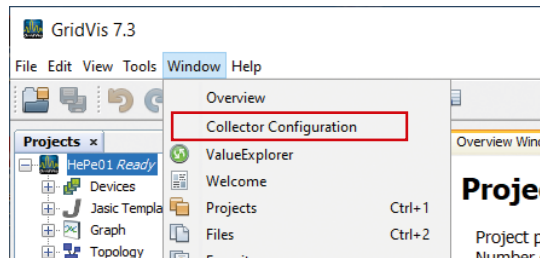
After the plug-in installation and restart of the GridVis software, configure the GridVis® Collector in the GridVis software.

The following example describes the configuration using the example of a new GridVis project.

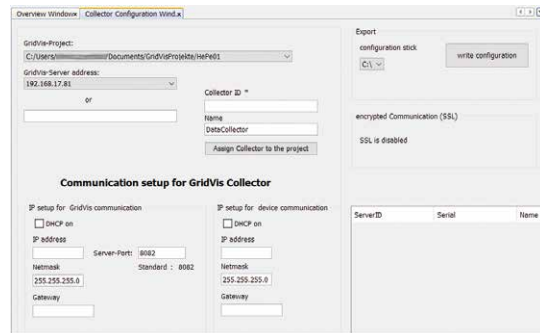
You can also use an existing project. For information on how to create a new project, refer to the online help for the GridVis software.

Step 1

- Click the "Window" drop-down menu in the menu bar of the GridVis software.
- Then click on the menu item "Collector configuration".

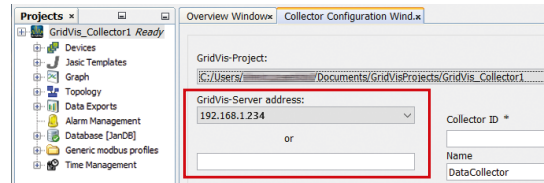
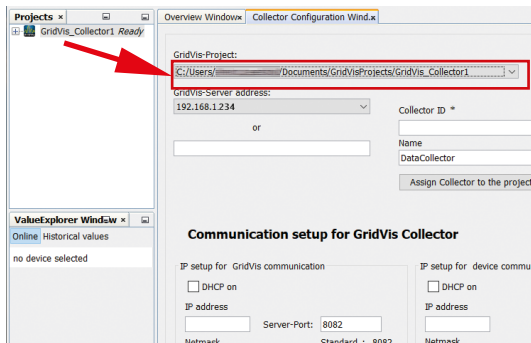


- The "Collector configuration" window appears.



Step 2

- In the "GridVis project" selection field, select your project path (in the example: the project "GridVis Collector").



Check the IP address of your computer in the "Windows Command Prompt".

- Press the Windows key.
- The start menu with the "Search" input field appears.
- Enter the command "cmd" and confirm with the "Return" key.

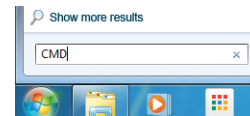


Fig.: Windows 7

Step 3

- Check the GridVis server IP address (IP address of the computer running the GridVis software). The GridVis software automatically recognizes this IP address. If it is not recognized, enter the address manually.

- The "Command prompt" window appears.
- Enter the command "ipconfig" and confirm with the "Return" key.

- The IP address, subnet mask and default gateway of your computer appear in the window of the "Command Prompt".

```

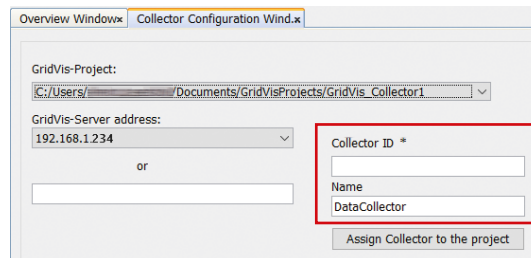
Microsoft Windows [Version 10.0.18362.295]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:

Connection-specific DNS Suffix . : firma.janitza.de
Link-local IPv6 Address . . . . . : fe80::48e1:acdb:5d03:9ce0%5
IPv4 Address. . . . . : 192.168.17.79
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 192.168.17.4
  
```



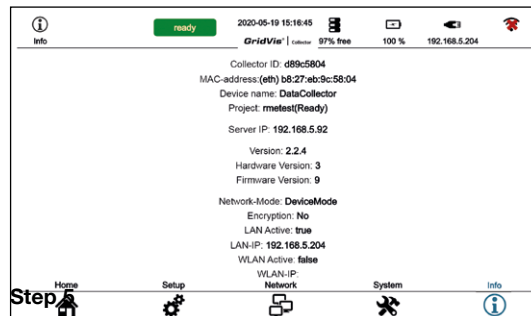
- The "Collector ID" can be found under the menu item "Info" in the main menu of your GridVis® Collector.

Step 4

- Enter the ID of your GridVis® Collector in the "Collector ID" input field and assign a name in the "Name" input field.

NOTE

The "Name" must not contain any special characters or umlauts!



- Configure the communication port (server port) for the data exchange between the GridVis® Collector and your computer (GridVis software).

NOTE

Recommendation: Use communication port (server port) 8082 or higher!

Do **not** use ports 8080 and 8081 as these are used by the software editions "Service" and "Ultimate".

The GridVis® Collector has two IP address ranges for IP address entry:

- IP address range for the devices on site (e.g. transformer station).
- IP address range for the network (server) in which the computer with the GridVis software is located.

The GridVis® Collector changes the IP addresses depending on the operating mode: "Server mode" or "Device mode".

In addition, the GridVis® Collector can send data via WLAN to the GridVis software in the server network (range in which the computer with the GridVis software is located).

In a network with a DHCP server, the GridVis® Collector automatically obtains the IP address when the DHCP mode is activated. However, the user of the GridVis® Collector normally configures the IP addresses on site, e.g. in the transformer station, due to a lack of a connection.

When assigning IP addresses in the GridVis® Collector,

Overview Windowx Collector Configuration Wind.x

GridVis-Project:
C:/Users/.../Documents/GridVisProjects/Grid_Vis_Collector1

GridVis-Server address:
192.168.1.234

or

Collector ID *
Name
DataCollector
Assign Collector to the project

Communication setup for GridVis Collector

IP setup for GridVis communication

DHCP on

IP address
Netmask
255.255.255.0

Server-Port: 8082
Standard : 8082

IP setup for device communication

DHCP on

IP address
Netmask
255.255.255.0

Ste

make sure that the IP addresses of the on-site measurement devices (e.g. transformer station) are in the same range. Otherwise, reconfigure the IP addresses in the GridVis® Collector (device mode) for each measurement device to be read out.

Example "Assignment of IP addresses"

The screenshot shows the 'Communication setup for GridVis Collector' window. At the top, the 'GridVis-Project' is set to 'C:/Users/helmut_peschka/Documents/GridVisProjects/GridVis_Collector1'. The 'GridVis-Server address' dropdown is highlighted with a red box and contains '192.168.1.234'. Below it, there is an 'or' label and an empty text input field. To the right, the 'Collector ID' is 'd89c5804', the 'Name' is 'GridVisCollector', and there is an 'Assign Collector to the project' button. The main section is titled 'Communication setup for GridVis Collector' and is divided into two columns: 'IP setup for GridVis communication' and 'IP setup for device communication'. Both columns have a 'DHCP on' checkbox (unchecked). The 'GridVis communication' column has an 'IP address' of '192.168.1.100', a 'Server-Port' of '8082', a 'Netmask' of '255.255.255.0', and an empty 'Gateway' field. The 'device communication' column has an 'IP address' of '192.168.5.254', a 'Netmask' of '255.255.255.0', and an empty 'Gateway' field. A red box highlights the entire configuration area.

has the IP address 192.168.1.234 in the server network.

- The GridVis® Collector (server mode) has the IP address 192.168.1.100 in the server network (network of the computer with GridVis software installed).
- The GridVis® Collector (device mode) has the IP address 192.168.5.254 at the measurement device on site.

In this example, the on-site measurement devices (e.g. transformer station) could be assigned IP addresses in the range from 192.168.5.1 to 192.168.5.253.

All on-site measurement devices that are not connected to a switch can be given the same IP address. The GridVis® Collector recognizes the measurement devices by their serial numbers.

6.3 Assigning measurement devices to the GridVis® Collector in the GridVis software

After the IP address configuration of the on-site measurement devices, register the GridVis® Collector in the GridVis software.

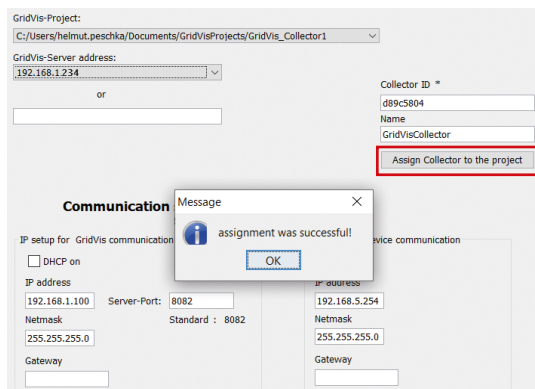
Afterwards, measurement devices from your GridVis project can be assigned to the GridVis Collector in the GridVis software.

- The computer with the GridVis software installed

Step 1

In the "Collector configuration" window of your GridVis software, click the "Integrate Collector into the project" button.

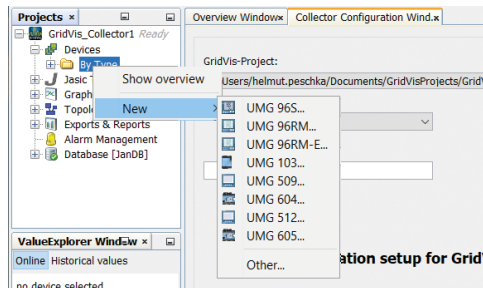
Make sure that the setting in the "GridVis project" selection list is correct.



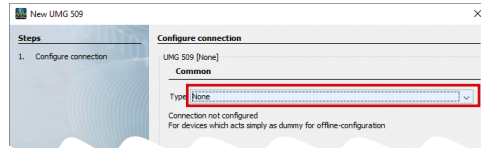
Confirm the registration in the "Message" dialog box with a click on the "OK" button.

Step 2

Since your GridVis software project "GridVis Collector" does not yet contain any devices, configure a measurement device (see the user manual for the measurement device).



For the connection type of your measurement device, set "None" since no communication between the GridVis software and the GridVis® Collector is based on an internal protocol.

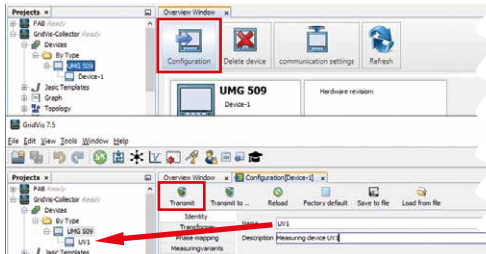


Step 3

The GridVis® Collector:

- Adopts the name of the measurement device assigned in the GridVis software and does not transfer this name to the on-site measurement device!

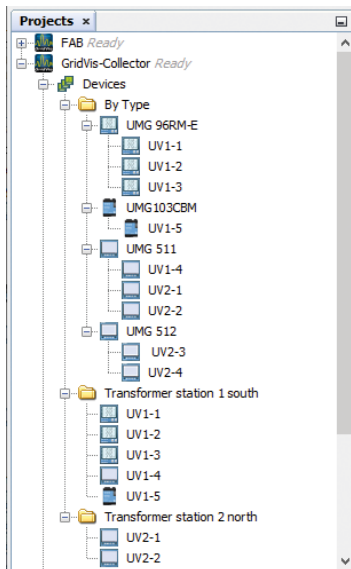
The name of the measurement device in the GridVis® Collector (from the GridVis software) does not have to match the name of the measurement device on site. The GridVis® Collector links ("binding") the serial numbers of the measurement devices at the stations with the GridVis devices using a special GridVis ID.



- Does not configure any measurement devices on site (e.g. transformer stations)! The name of the on-site measurement device is configured during its initial commissioning.

Recommendation

For a better overview in the GridVis software, we recommend that you arrange your measurement devices or transformer stations in a tree directory (see screenshot).

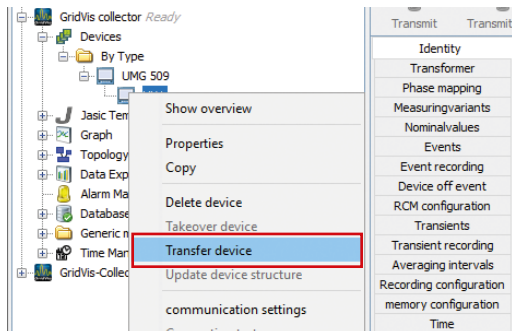


In the GridVis® Collector, a tree structure appears over several pages. This gives a better overview when there is a large number of measurement devices. This avoids the need to scroll through a long list. Please note that within one folder up to 3 subfolders are supported. An unlimited nesting depth is not possible.

Step 4

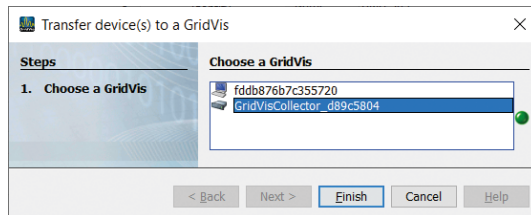
Assign the measurement device of the GridVis software to the GridVis® Collector.

- Right-click on the measurement device in the Grid-Vis software.
- In the drop-down menu, select the item "Assign device".



When assigning the measurement device to the Grid-Vis® Collector, the "GridVis®Collector service" running in the background takes care of the connection (for import and readout) to the measurement device.

- Select the GridVis® Collector item in the "Transferring devices to a GridVis" window.



- To finish, click the "Finish" button.

NOTE

If the GridVis® Collector detects a project that it has already saved, projects can be synchronized directly by pressing the "Download" button in the GridVis® Collector (Start--> Server mode--> Download).

NOTE

If secure communication was set in the security configuration in the GridVis software, this status information appears in the configuration window (see screenshot).

The screenshot displays the configuration window for a GridVis Collector. On the left, the 'GridVis-Project' is set to 'C:/Users/.../Documents/GridVisProjects/GridVis_Collector1'. The 'GridVis-Server address' is '192.168.1.234'. Below this, there is an 'or' label and an empty text field. To the right, the 'Collector ID *' is 'd89c5804' and the 'Name' is 'GridVisCollector'. A button labeled 'Assign Collector to the project' is located below these fields. On the right side of the window, the 'Export' section shows 'configuration stick' set to 'C:\' and a 'write configuration' button. Below this, the status 'encrypted Communication (SSL)' is shown as 'active', which is highlighted with a red rectangular box.

6.4 Transferring a GridVis software project to the GridVis® Collector

After the IP address configuration and the transfer of the measurement devices via the GridVis software is completed, the project can be transferred to the Grid-Vis® Collector.

The project configuration is transferred via the USB flash drive included in delivery (with NTFS formatting).

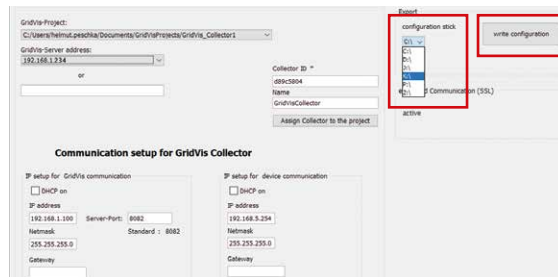
NOTE

The GridVis software stores data as of a plug-in version > 1.1.11 or higher. A GridVis project can manage several GridVis collectors. To retrieve stored data, select the project and enter the collector ID.

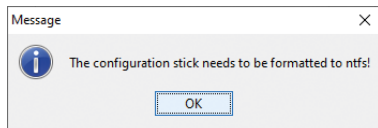
The GridVis software creates a connection to the data-base and to previously recorded GridVis Collector data and automatically fills in the input fields (IP address, port, etc.).

Step 1

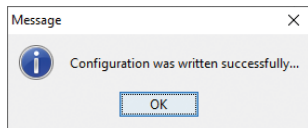
- Insert the USB flash drive into the USB port of your computer.
- In the "Collector configuration" window of your GridVis software, in the "Export" area, use the "Configuration stick" selection list to select the directory of your USB flash drive.
- Click the "Write configuration" button.



Use an NTFS formatted USB flash drive! Otherwise the following error message will appear:



For a USB flash drive with NTFS formatting (supplied), the following message appears:



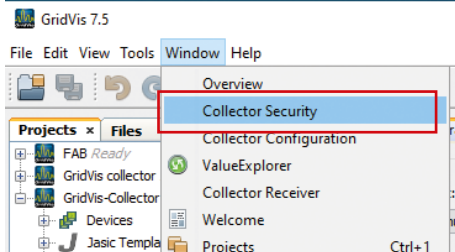
Step 2

NOTE

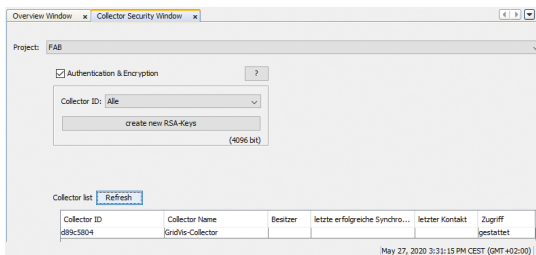
Skip this step if you do not want secure communication between the GridVis® Collector and the GridVis software because, for example, your network is inaccessible to third parties.

If the connection between the GridVis® Collector and the GridVis software is to be established using an authentication or encrypted form of communication:

- In the user interface of the GridVis software, click the item "Window" in the menu bar.
- In the drop-down menu that appears, click the menu item "Collector security".



- The "Collector security" window appears.



- In the "Project" selection list, select your GridVis project.

NOTE

A description of the initial configuration of the collector security and the secured communication can be found in section „6. 6 Secure data communication“ on page 72.

- Activate "Authentication and Encryption" by ticking the checkbox.
- Then select the "Collector ID" of the GridVis® Collector you want to secure. The selection list item "All" creates an RSA key for all GridVis Collectors assigned to the GridVis project.

- Select your USB flash drive from the selection list.
- Finally, click the "Export RSA key sets" button to save your RSA key pair on the USB flash drive.

NOTE

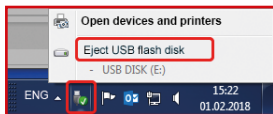
Important! For authentication or encrypted communication, it is essential that you follow the order of the instructions!

1. Configuring the GridVis® Collector in the GridVis software (project selection, IP settings, assigning devices, etc.) – for a description, see „6. 2 Configuring the GridVis® Collector in the GridVis software“ on page 50.
2. Save the configuration on the USB flash drive. **Do not remove the USB flash drive during configuration!**
3. The project can only be saved in the security database of the GridVis software and the security settings can only be made once the configuration of the Grid-Vis® Collector has been saved on the USB flash drive. A more detailed description can be found in section „6. 6 Secure data communication“ on page 72.

Step 3

Remove your USB flash drive **after the GridVis® Collector configuration and the security configuration properly!** Otherwise there is a risk of data loss!

- Right-click on the USB flash drive icon in the system tray on the right.
- In the drop-down menu that appears, select the item "Eject USB flash disk" (see figure).



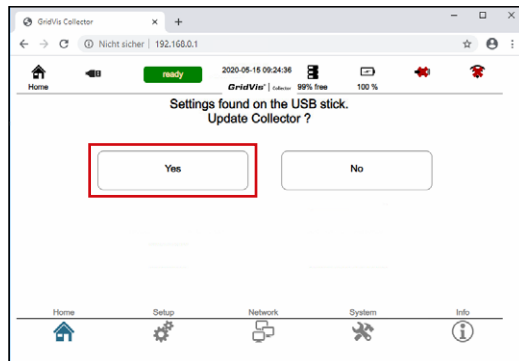
- The message "Hardware now can be removed" appears.
- Remove the USB flash drive from the interface.

Step 4

NOTE

Before you import the data from the USB flash drive to the GridVis® Collector, go to the start screen view (press the "Start" button)!

- Insert the USB flash drive into the USB port of the GridVis® Collector.
- The GridVis® Collector automatically detects the USB flash drive and the following message appears after about 10 seconds:



- Press the "Yes" button. It takes about 1 minute for the configuration to be applied.

- The message "Please remove the USB stick" appears.

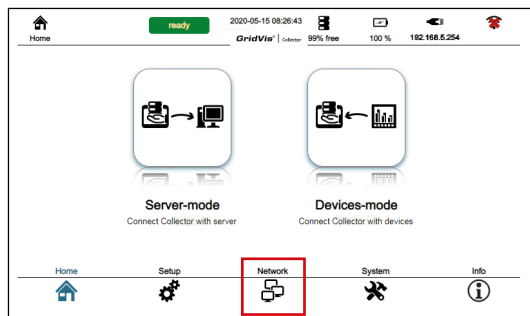


- Remove the USB flash drive from the GridVis® Collector. This is followed by an initialization that lasts about 2 minutes.

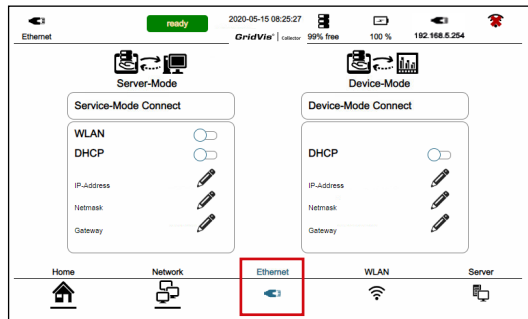
The GridVis® Collector is configured and ready for on-site readout of the measurement devices (e.g. transformer stations).

To check the network settings on the GridVis® Collector:

- Press the "Network" button.



- Then press the "Ethernet" button.
- The network settings appear.

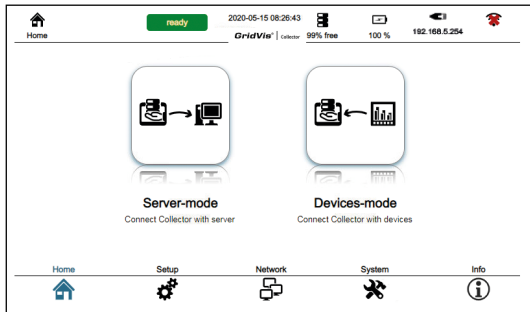


To check the device list:

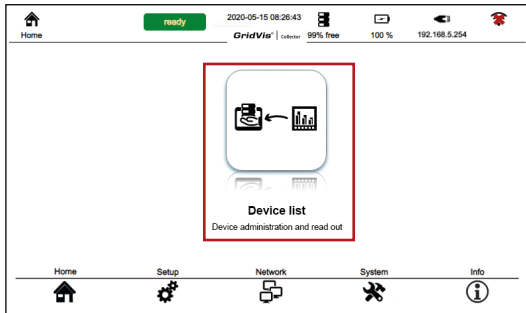
- Press the "Device mode" button in the GridVis® Collector start menu.

NOTE

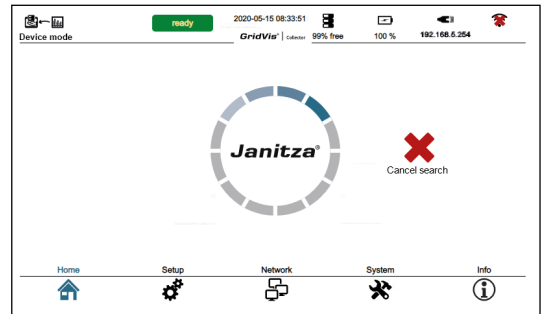
TIP: Press the "Info" button to check the installation of your project on the GridVis® Collector



- Press the "Device list" button.



- The GridVis® Collector searches for connected measurement devices. The search process takes longer with no measurement devices. Do not cancel the process if the device list is to be loaded.



- The measurement device added in the example appears.

The screenshot shows the GridVis Collector interface. At the top, it displays the status 'ready', the date and time '2020-05-15 09:41:49', and system information: 'GridVis® Collector', '99% free', '100%', and '192.168.5.193'. Below this, the current location is 'Trafostation1 - South' with a '2/2' indicator. There are two buttons: 'Connection test' and 'Read devices'. A table lists the devices:

Type	Device name	S/N	last reading point	Connection	Status	Verb.
	UV1-5					

At the bottom, there is a navigation bar with icons for Home, Setup, Network, System, and Info.

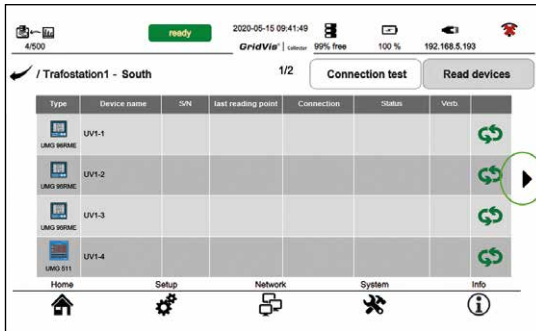
A tree structure created in the GridVis software and transferred to the GridVis® Collector is displayed in the GridVis® Collector display in a user-friendly manner and optimized for the touch display.

The screenshot shows the GridVis Collector interface with a tree structure. At the top, it displays the status 'ready', the date and time '2020-05-15 09:41:49', and system information: 'GridVis® Collector', '99% free', '100%', and '192.168.5.193'. Below this, the current location is 'Trafostation1 - South' with a '2/2' indicator. There are two buttons: 'Connection test' and 'Read devices'. A table lists the devices:

Type	Device name	S/N	last reading point	Connection	Status	Verb.
Trafostation1 south						
Trafostation 2 north						
	UV2-3					
	UV2-4					

At the bottom, there is a navigation bar with icons for Home, Setup, Network, System, and Info.

Up to 4 measurement devices appear on the display of the GridVis® Collector. Other measurement devices that have been assigned to a directory (e.g. transformer station) appear with an "arrow" for scrolling through the display.



The screenshot shows the GridVis Collector interface. At the top, there is a status bar with a green 'ready' indicator, the date and time '2020-05-15 09:41:49', and system information: 'GridVis Collector 99% free 100 % 192.168.5.193'. Below this, the location is 'Trafostation1 - South' and the page number is '1/2'. There are two buttons: 'Connection test' and 'Read devices'. The main content is a table with the following columns: Type, Device name, SN, last reading point, Connection, Status, Verb., and an action column. The table contains four rows of devices, all of type 'UMG WPMAC'. The 'UV1-2' row has a right-pointing arrow in the action column, which is circled in green. At the bottom, there is a navigation bar with icons for Home, Setup, Network, System, and Info.

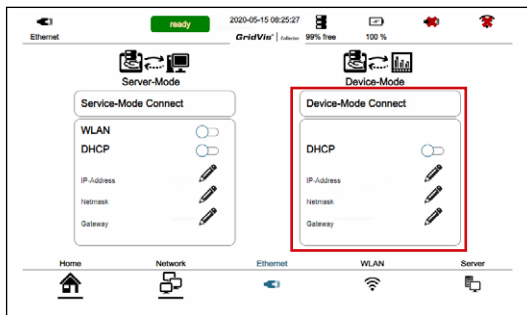
Type	Device name	SN	last reading point	Connection	Status	Verb.	
UMG WPMAC	UV1-1						↻
UMG WPMAC	UV1-2						▶
UMG WPMAC	UV1-3						↻
UMG 811	UV1-4						↻

6.5 Integration of RS-485 measurement devices

To be able to read measured values from RS-485 measurement devices (UMG 103-CBM, UMG 96RM-CBM, UMG 96PA), first manually configure connected measurement devices using the USB/RS-485 converter.

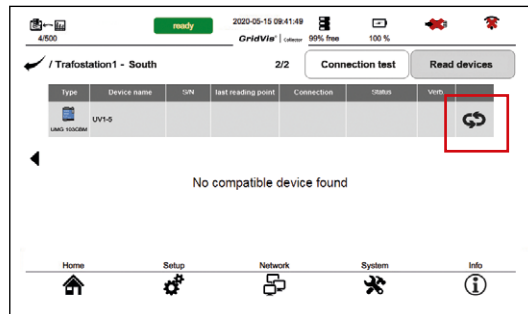
Step 1

To integrate only RS-485 measurement devices, deactivate the DHCP mode in the network settings. If no further IP address is entered, the device mode is called up more quickly because the GridVis® Collector does not search for an Ethernet connection.



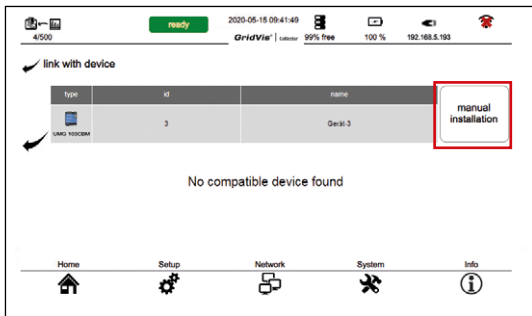
Step 2

Since the GridVis® Collector does not search for RS-485 measurement devices automatically, now press the "Binding" icon.

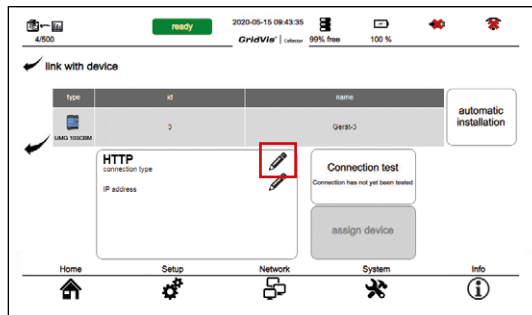


Step 3

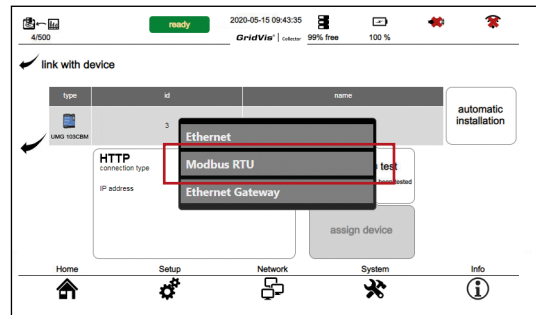
Configure the RS-485 settings manually. To do so, press the "Manual settings" button.



The window for changing the connection type appears:



Pressing the "pen" icon displays 3 connection types:



Select the connection type "Modbus RTU". The window for configuring the connection appears.

ready 2020-05-15 09:45:20 99% free 100 % 192.168.5.193

link with device

type	id	name
UMG 103CBM	3	Gerst-3

automatic installation

Modbus RTU
connection type
1
Modbus address
115200
Baudrate
3
connection attempts
5000
Timeout in ms

Connection test
Connection has not yet been tested

assign device

Home Setup Network System Info

Configure your connection settings (for RS-485 measurement devices Modbus RTU) by pressing the respective "pen" icons, such as:

- Connection type
- Modbus address
- Baud rate
- Connection attempts and timeout (normally requires no setting).

NOTE

The UMG 103-CBM has automatic baud rate detection (configure 115200 baud/s in the GridVis® Collector for this purpose). Optionally, the baud rate detection can be disabled and a fixed baud rate set for the UMG 103-CBM. As the UMG 103-CBM has no display and therefore the setting cannot be checked, try the baud rates of 9600, 19200, 38400, 57600 or 115200 until the connection test is positive.

Before assigning the communication, check your connection using the "Connection test" button!

ready 2020-05-15 09:46:05 99% free 100 %

link with device

type	id	name
UMG 103CBM	3	Gerst-3

automatic installation

Modbus RTU
connection type
1
Modbus address
115200
Baudrate
3
connection attempts
5000
Timeout in ms

Connection test
no connection

assign device

Home Setup Network System Info

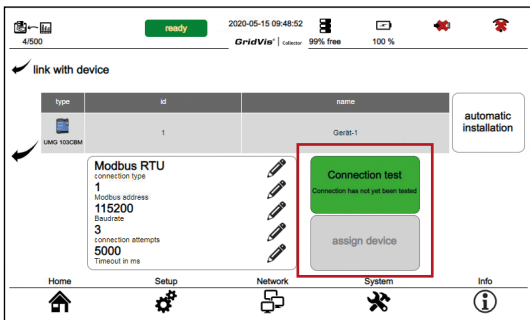
If the connection test is negative, the "Connection test" button is red on the display of the GridVis® Collector.

Check and if necessary change:

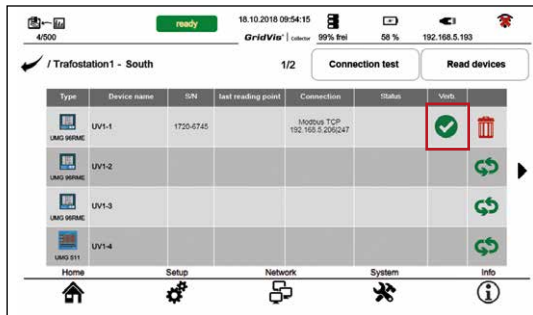
- Their connection settings.
- Terminals A and B on your USB/RS-485 converter.

Only after a positive "connection test" (green button) can your RS-485 measurement device be assigned to the GridVis® Collector!

Press the "Assign device" button.



When a connection is established, a green check mark appears in the device list in the "Connection" column.



The description for reading out your RS-485 measurement device (connection via USB/RS-485 converter) can be found in section „7. 2 Reading out measured values from RS-485 measurement devices“ on page 82.

6.6 Secure data communication

Public or private networks require authentication and encrypted communication. Starting with firmware version 2.0.0 the GridVis® Collector fulfils this requirement with an additional security plug-in. The authentication and the communication itself are 1024-bit RSA encrypted.

Authentication on the GridVis software (PC/Server)

An RSA key pair is generated via the security plug-in of the GridVis software. The GridVis® Collector receives a private RSA key; the matching public RSA key is contained in the GridVis software. The RSA key has an encryption strength of 1024 bits. The RSA key pairs are generated by a function developed by JAVA for this purpose (`java.security.KeyPairGenerator`).

Encryption of data transmission

An RSA key pair is also generated here via the security plug-in of the GridVis software. In this case, the GridVis® Collector receives the public RSA key and the GridVis software receives the private RSA key.

Functional description

An RSA key pair must be generated for each GridVis® Collector. The respective private RSA key is stored on the GridVis® Collector, the public RSA key is assigned to the PC/server running the GridVis software.

When logging on to the GridVis software, an individual string for the GridVis® Collector is encrypted with the private RSA key of the GridVis® Collector and is verified with the public key on the server.

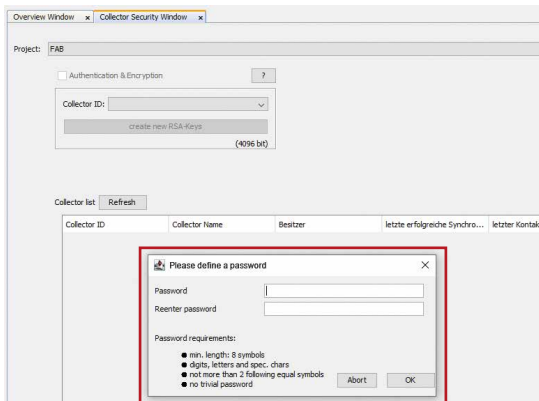
If the decryption is successful and the string is assigned to the respective GridVis® Collector, communication is enabled. The key strength is 1024 bits.

Communication with certain GridVis® collectors can be blocked by the administrator from the PC/server running the GridVis software. After that, even the administrator can no longer log on with a valid RSA key.

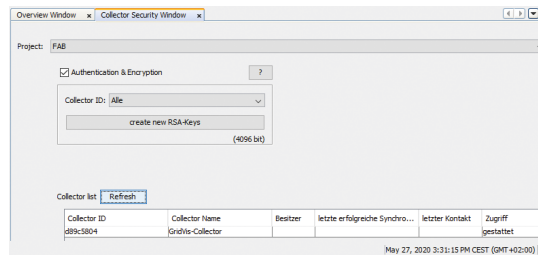
The first time you call it up, enter an administrator password (Figure). This password must meet the following requirements:

- At least 8 characters.
- Numbers, letters and special characters.
- No more than 2 consecutive, identical characters.
- No trivial passwords (password that corresponds to the keyboard layout, for example).

The following figure shows the password entry. Each project requires its own password!



The RSA keys for authentication and encryption are written to a USB flash drive. The GridVis® Collector adopts the RSA keys directly from the USB flash drive.



The "Collector list" shows all GridVis Collectors. Access can be disabled by the administrator via the "Disallow/allow connection" field (right-click on the "Access" field).



If the project is switched or the security plug-in is opened, the security plug-in requests the administrator password for the respective project:



NOTE

The password of a project is valid until the collector security window of the project is closed or the GridVis software is terminated.

An additional RSA key pair is generated for the encryption of data between the GridVis® Collector and the GridVis software (PC/computer). The GridVis software (PC/computer) is given a private RSA key, the GridVis® Collector a public RSA key.

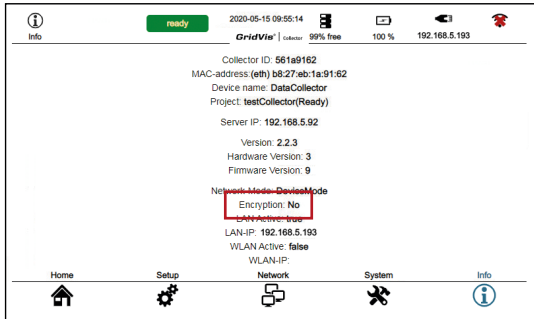
The encryption of small amounts of data is done directly via the public RSA key. Records and sequences are too large for the asymmetrical RSA key. For this purpose, a symmetrical RSA key is created on the GridVis® Collector and transmitted encrypted using the public RSA key. The symmetrical RSA key protects the data in this case.

Uninstalling the security plug-in does not remove the encryption.

NOTE

After the initial configuration, generate a new RSA key using the "Export RSA key sets" button in the collector security window of the GridVis software. After the RSA key set has been exported and imported on the GridVis® Collector, restart the GridVis software and the GridVis service!

The information window of the GridVis® Collector shows the status of the encryption.



The screenshot displays the 'Info' window of the GridVis Collector. At the top, there is a status bar with a green 'ready' indicator, the date '2020-05-15 09:55:14', and system metrics: 'GridVis® | Collector 99% free', '100 %', and '192.168.5.193'. Below this, the following information is listed:

- Collector ID: 561a9162
- MAC-address (eth) b8:27:eb:1a:91:62
- Device name: DataCollector
- Project: testCollector(Ready)
- Server IP: 192.168.5.92
- Version: 2.2.3
- Hardware Version: 3
- Firmware Version: 9
- Network Mode: Device Mode
- Encryption: No
- LAN Active: true
- LAN-IP: 192.168.5.193
- WLAN Active: false
- WLAN-IP:

The 'Encryption: No' line is highlighted with a red rectangular box. At the bottom of the window, there is a navigation bar with icons for Home, Setup, Network, System, and Info.

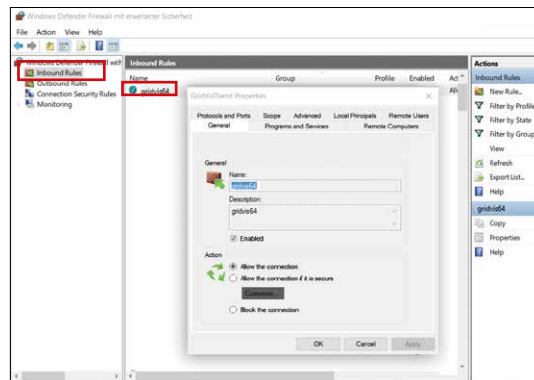
6.7 Windows firewall

Since the GridVis® Collector sends the data to the database of the GridVis software, the communication port must be enabled in both directions. This means that an **active** Windows firewall blocks communication.

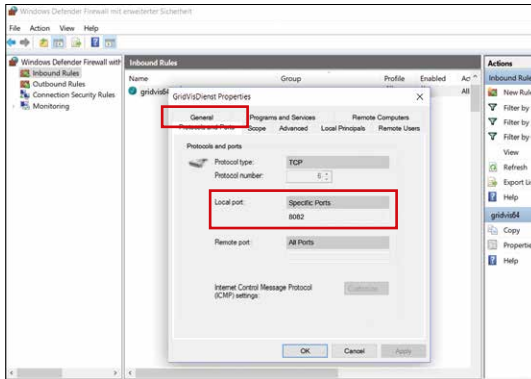
In the "Windows Firewall with Advanced Security" window, configure an incoming rule for the connection to the GridVis software (gridvis64).

In the MS Windows operating system you can access the **"Windows Firewall with Advanced Security"** window via:

- Control Panel > Windows Firewall > Advanced Settings
- Then click the "Incoming Rules" button.
- The list of incoming rules appears.
- Right-click on the entry "gridvis64" and select "Properties" from the context menu that appears.
- The "Properties of gridvis64" dialog window appears.



- In the "Properties of gridvis64" dialog window select the tab "Protocol and Ports".
- On the "Protocol and Ports" tab, configure your port that is enabled for communication.



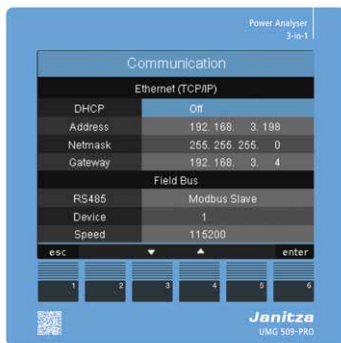
7. Operation

7.1 Reading out measured values

After the GridVis software project has been transferred to the GridVis® Collector, the GridVis® Collector is ready to read out measurement devices on site.

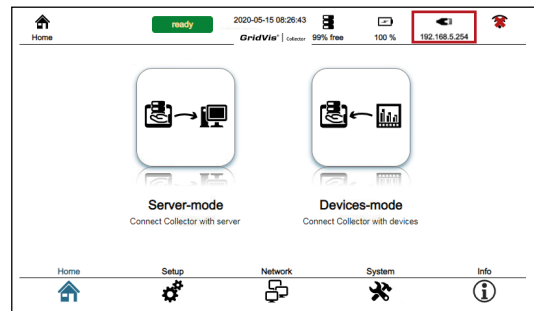
Step 1

- Configure a fixed IP address on the measurement device (see the measurement device user manual).



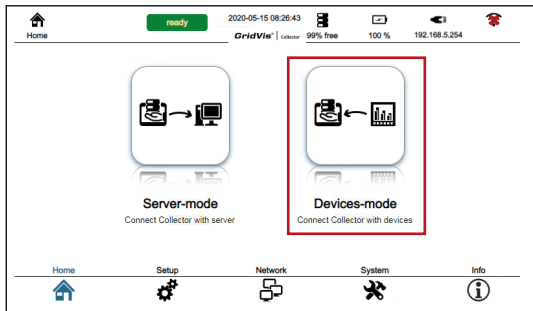
Step 2

- Connect the measurement device to the GridVis® Collector via the Ethernet interface (Ethernet cable included in delivery).
- The Ethernet icon in the title bar of the GridVis® Collector user interface shows the correct connection.

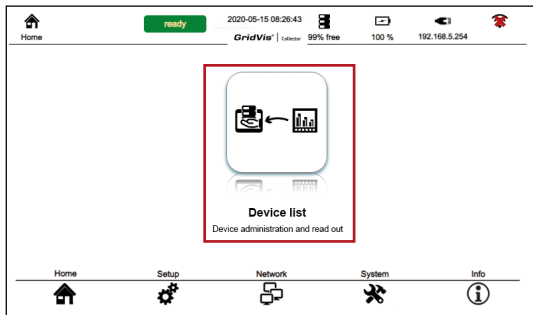


Step 3

- Open the "Device mode" by pressing the corresponding button.

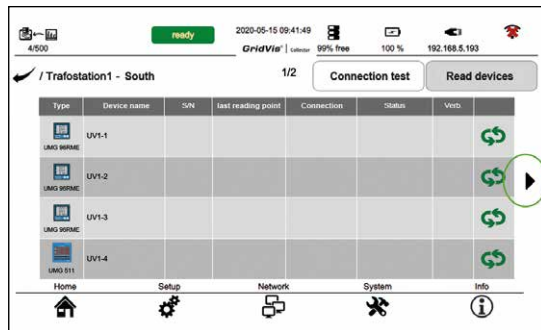


- The “Device mode” user interface appears.
- Open the “Device list” by pressing the button.



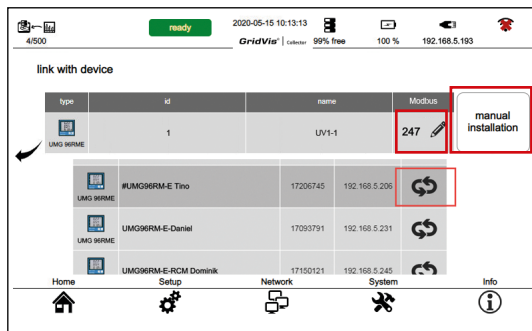
Step 4

- When the page is opened, the GridVis® Collector automatically searches the measurement device network for known measurement devices. Use the "Connection test" button to start this process manually.
- For measurement devices that have not yet been connected to the GridVis® Collector ("Binding", on page 38), a "Connection icon" appears in the device list. Automatic scanning is not possible for devices connected via the USB/RS-485 converter because the RS-485 parameters must be set beforehand.



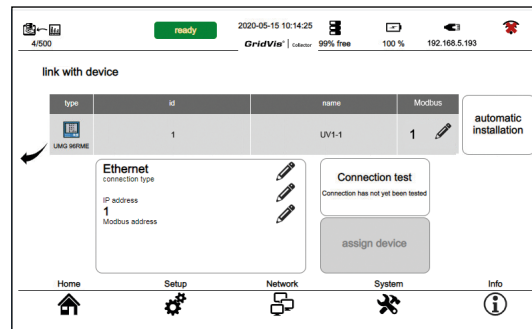
Step 5

- Pressing the "Connection icon" button selects the on-site measurement device that is to be connected to the measurement device entered in the GridVis® Collector (see section „6.3 Assigning measurement devices to the GridVis® Collector in the GridVis software“ on page 54).



For measurement devices that you read out via Modbus TCP/IP, configure the Modbus address using the function "Manual setting". **Exception:** For the measurement device **UMG 96RM-E (firmware version >3.04)**, the GridVis® Collector finds and uses the Modbus address automatically.

The "Manual setting" button is used for manual integration of measurement devices (e.g. with IP and Modbus address).



The serial number of the on-site measurement device is now linked to the measurement device entered in the GridVis® Collector.

NOTE

After an initial linking of measurement devices on site with the measurement devices entered in the GridVis® Collector, the linking will be done automatically in the future. The measurement devices can be read out immediately.

Step 6

- Pressing the "Read out all devices" button reads out all measurement devices connected to the GridVis® Collector.

2/500 1804884 GridVis:1 31M GridVis® Collector 98% free 100 % 192.168.5.204

reading out devices... connection test readout devices

type	device name	S/N	last timestamp	connection	state	Con.
UMG WIRME	Gerbi-1	1720-4745	18.05.2020 12:45	Modbus TCP 192.168.5.206:247	waiting	✓
UMG S12	Gerbi-3	4200-4963	12.05.2020 19:57	HTTP 192.168.5.100	waiting	✓

Home Setup Network System Info

2/500 1804884 GridVis:1 32M GridVis® Collector 98% free 100 % 192.168.5.204

reading out devices... connection test readout devices

type	device name	S/N	last timestamp	connection	state	Con.
UMG WIRME	Gerbi-1	1720-4745	18.05.2020 12:45	Modbus TCP 192.168.5.206:247	waiting	✓
UMG S12	Gerbi-3	4200-4963	12.05.2020 19:57	HTTP 192.168.5.100	waiting	✓

Home Setup Network System Info

2/500 1801840 GridVis:1 34M GridVis® Collector 98% free 100 % 192.168.5.204

reading out devices... connection test readout devices

type	device name	S/N	last timestamp	connection	state	Con.
UMG WIRME	Gerbi-1	1720-4745	19.05.2020 14:30	Modbus TCP 192.168.5.206:247	will be finished 97%	✓
UMG S12	Gerbi-3	4200-4963	18.05.2020 13:50	HTTP 192.168.5.100	is read out 3%	✓

Home Setup Network System Info

The screenshot shows the GridVis Collector interface. At the top, there is a status bar with 'ready' in a green box, the date '2020-05-19 14:30:39', and system metrics like '98% free' and '100%' battery. Below this is a 'reading out devices...' section with a 'connection test' button and a 'readout devices' button. A table lists two devices: 'Gerbi-1' and 'Gerbi-3'. The 'last timestamp' for 'Gerbi-1' is '19.05.2020 14:30' and for 'Gerbi-3' is '18.05.2020 13:50'. The table has columns for 'type', 'device name', 'SN', 'last timestamp', 'connection', 'state', and 'con.'. At the bottom, there are navigation icons for Home, Setup, Network, System, and Info.

type	device name	SN	last timestamp	connection	state	con.
UMS HOME	Gerbi-1	1720-674	19.05.2020 14:30	Modbus TCP 82.168.5.208.247	Finished 100 %	✓
UMS B12	Gerbi-3	4200-494	18.05.2020 13:50	HTTP 192.168.5.100	Finished 100 %	✓

The device list of the GridVis® Collector shows the data of the on-site measurement device, such as:

- The type of measurement device.
- The name of the measurement device.
- The serial number.
- The last readout time (date, time) of the measured values in the data memory of the GridVis® Collector.
- The IP address.
- Status and connection information.

You can then synchronize measurement devices (measured values) with the database of the GridVis software or read out further measurement devices (see section „7. 3 Synchronizing measured values with the GridVis software database“ on page 84).

7.2 Reading out measured values from RS-485 measurement devices

To read measured values from RS-485 measurement devices (measurement devices connected via USB/RS-485 converter), first connect your device as described in section „6. 5 Integration of RS-485 measurement devices“ on page 68.

Readout after the initial setup

The GridVis® Collector first checks the serial number before reading out a measurement device. The serial number is used by the GridVis® Collector to uniquely identify the measurement device.

Since the GridVis® Collector does not perform an automatic connection test for an RS-485 connection to a measurement device (via USB/RS-485 converter), first check the connection by pressing the "Connection test" button.

The screenshot shows the GridVis Collector interface for 'Trafostation1 - South'. The top status bar indicates 'ready', the date '2020-05-15 09:41:49', and system metrics: '99% free', '100 %', and '192.168.5.193'. Below the title bar, there are two buttons: 'Connection test' (highlighted with a red box) and 'Read devices'. A table below lists device information:

Type	Device name	S/N	last reading point	Connection	Verb
UMG 100CBM	UV1-6	7511-0540	18.10.2018 10:30	Modbus 1	

At the bottom, there is a navigation bar with icons for Home, Setup, Network, System, and Info.

When the "Read devices" button is pressed, the GridVis® Collector reads out your RS-485 measurement device.

The screenshot shows the GridVis Collector interface after the 'Read devices' button has been pressed. The 'Read devices' button is now highlighted with a red box. The table below shows the device status updated:

Type	Device name	S/N	last reading point	Connection	Status	Verb
UMG 100CBM	UV1-6	7511-0540	18.10.2018 10:30	Modbus 1	is read out 86 %	

After the connection test, the GridVis® Collector enables the "Read devices" button.

The screenshot shows the GridVis Collector interface after the 'Connection test' button has been pressed. The 'Read devices' button is now highlighted with a red box. The table below shows the device status updated with a green checkmark:

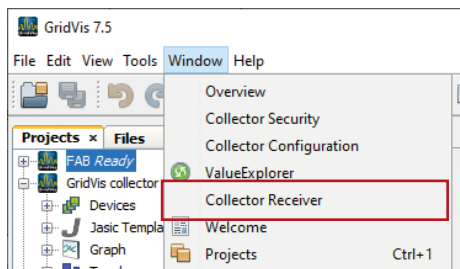
Type	Device name	S/N	last reading point	Connection	Status	Verb
UMG 100CBM	UV1-6	7511-0540	18.10.2018 10:30	Modbus 1		

7.3 Synchronizing measured values with the GridVis software database

After reading out the measurement devices on site, synchronize the measured values collected in the GridVis® Collector with the database of the GridVis software. To do so, proceed as follows:

Step 1

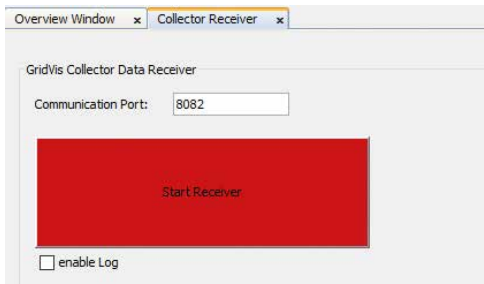
- Start the GridVis software (as of the "Professional" edition).
- Click the "Window" drop-down menu in the menu bar of the GridVis software.
- Then click the "Collector Receiver" menu item.



- The "Collector-Receiver" plug-in starts a communication channel (service) for data exchange with the GridVis® Collector that runs in the background.
- The "Collector Receiver" window appears.
- In the "Communication port" input field, select the same communication port as in the GridVis Collector (see section 6.2 „Step 5“ on page 52).
- Start the communication channel for the data exchange (Collector Receiver) between the GridVis software and the GridVis® Collector by clicking the "Start Server" button.

NOTE

The communication channel for the data exchange (Collector Receiver) in the GridVis software must be started manually as of the "Professional" edition. As of the GridVis "Service" edition, the communication channel for the data exchange (Collector Receiver) can also be started automatically. The automatic start is performed by the GridVis system service (for setup and description, see the section „7.4 Integrating plug-ins in the GridVis system service“ on page 88).



Display for "Communication channel (service) for data exchange":

- Red = service disabled.
- Green = service enabled.

Overview Window x Collector Receiver x

GridVis Collector Data Receiver

Communication Port: 8082

Stop Receiver

enable Log Server running

Upload Status

Collector	Project	Device	Value Type	State	
DataCollector_68F4...	UMG 103	UMG 103-W1		Erfolgreich	X
DataCollector_68F4...	UMG 103	UMG 103-W2		Erfolgreich	X
DataCollector_68F4...	UMG 103	UMG 103-W3		Erfolgreich	X
DataCollector_68F4...	UMG 103	UMG 103-W4		Erfolgreich	X
DataCollector_68F4...	UMG 103	UMG 103-Labor-1		Erfolgreich	X
DataCollector_68F4...	UMG 103	UMG 103-Labor-2		Erfolgreich	X
DataCollector_68F4...	UMG 103	UMG 103-Labor-3		Erfolgreich	X
DataCollector_68F4...	UMG 103	UMG 512		Erfolgreich	X
DataCollector_68F4...	UMG 103	UMG 511	Strom effektiv	Uploadorgan...	

NOTE

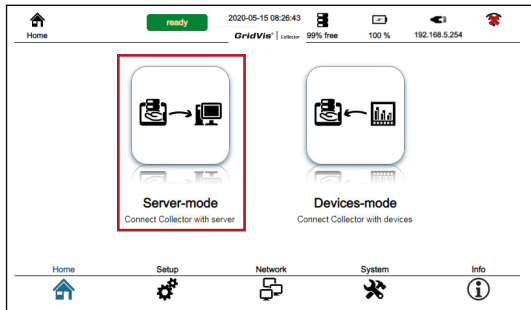
- Data is transferred from the GridVis® Collector to the GridVis server via the communication port.
- All GridVis® Collectors share one communication port.
- Please ensure that the communication port set in the GridVis software matches the GridVis® Collector configuration.

NOTE

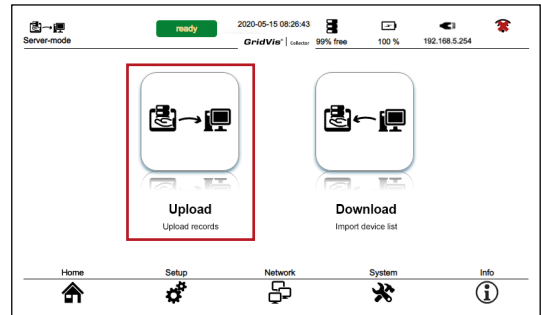
Since the GridVis® Collector actively sends data to the PC/server using the GridVis installation software, the communication port (e.g. 8082) must be enabled in the Windows firewall under "incoming rules". Otherwise, Windows blocks the sending of data. Contact your system administrator if necessary.

Step 2

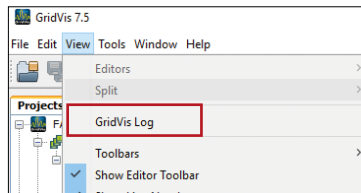
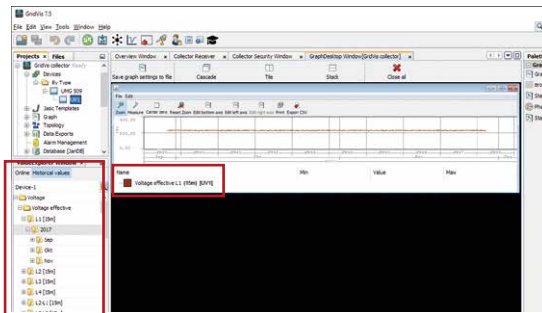
- Connect the GridVis® Collector to the network in which the GridVis software is running.
- In the GridVis® Collector, open the “Server mode” by pressing the button.



- In server mode, press the "Upload" button.



- The data of the GridVis® Collector are subsequently synchronized with the GridVis software. Depending on the number of measurement devices to be synchronized, this process may take several minutes.
- After successful synchronization you will find the data in the GridVis software in the folder “Historical values”.



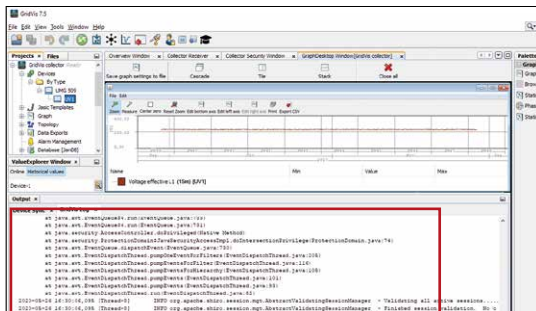
- The "GridVis Log" window appears for checking the communication. Integrate plug-ins in the GridVis system service.

Step 3

NOTE

You can check the communication between the Grid-Vis® Collector and the GridVis software in the GridVis log file of the GridVis software.

- Click the "View" drop-down menu in the menu bar of the GridVis software.
- Then click the "GridVis Log" menu item.

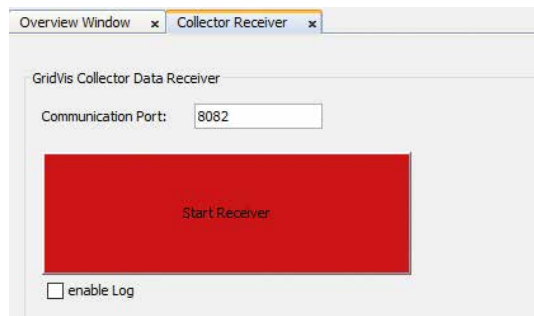
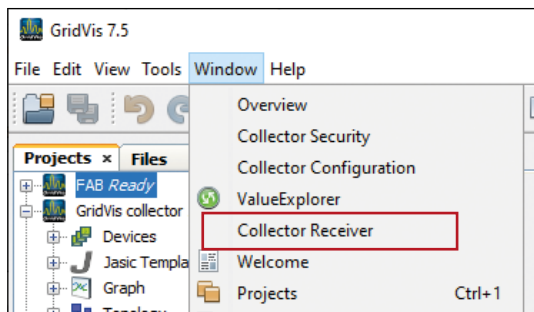


7.4 Integrating plug-ins in the GridVis system service

To use the GridVis® Collector you need at least the "Professional" edition of the GridVis software (desktop).

The communication channel for the data exchange (Collector Receiver) between the GridVis software and the GridVis® Collector must be started in the GridVis software,

- manually as of the "Professional" edition,
- automatically as of the "Service" edition (see section „7. 3 Synchronizing measured values with the



GridVis software database“ on page 84).

In the **GridVis "Professional" edition:**

- The "Collector Receiver" is only activated after a restart.
- The plug-in "GridVis_Desktop_Collector_DataReceiver-X.X.XX*.nbm" is required for manual starting.

As of the GridVis "Service" edition:

- The GridVis system service can start the "Collector Receiver" automatically.
- The plug-in "GridVis_Service_Collector_DataReceiver-X.X.XX*" is required for automatic starting.

7.5 Configuration of the automatic start of the

Collector Receiver as of the GridVis "Service" edition

Step 1

Close the GridVis system service:

- Press the Windows key.
- The start menu with the "Search" input field appears.
- Enter the command "Services" and confirm with the "Return" key.

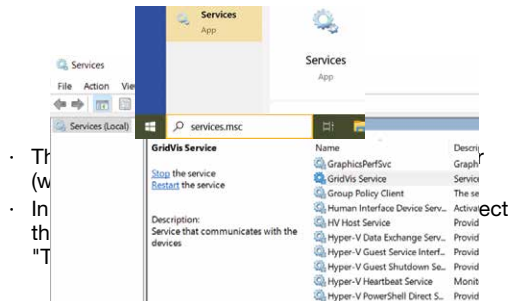


Step 2

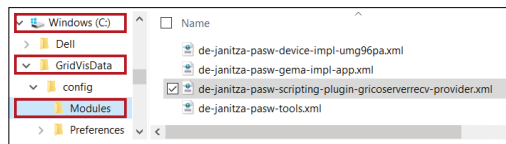
- On the USB flash drive included in delivery, open the directory "GridVis Service Collector Data Receiver".
- The "config" and "modules" directories appear.

<input type="checkbox"/>	Name	Date modified	Type
	config	19/05/2020 15:44	File folder
	modules	19/05/2020 15:44	File folder

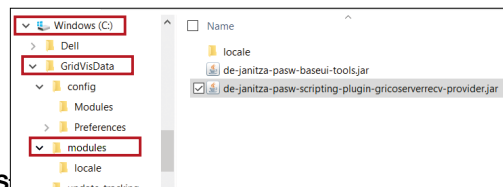
- From the "config/modules" directory, copy the file "de-janitza-pasw-scripting-plugin-gricoserverrecv-provider.xml" to the clipboard (mark the file with a mouse click and then press "Ctrl + C").



- On your computer, open the directory "(C:)\GridVis-Data\configModules" and use "Ctrl + V" to paste the file from the clipboard (press "Ctrl + V").



- Open the directory "GridVis Service Collector Data Receiver" on the USB flash drive once again.
- From the "modules" directory, copy the file "de-janitza-pasw-scripting-plug-in-gricoserverrecv.jar" to the clipboard (mark file with a mouse click and press "Ctrl + C").
- On your computer, open the directory "(C:)\GridVis-Data\modules" and paste the file from the clipboard (press "Ctrl + V").

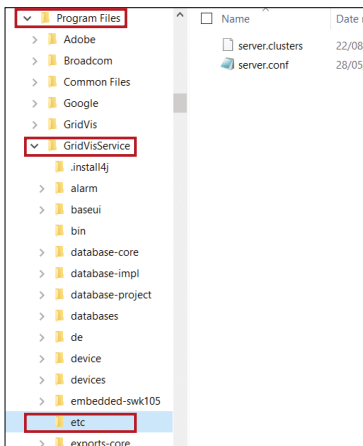


S

Make sure that the communication ports of the GridVis® Collector (in the "Collector Configuration" window) and the GridVis software (in the "Collector Receiver" window) match (see sections „6. 2 Configuring the GridVis® Collector in the GridVis software“ on page 50 and „7. 4 Integrating plug-ins in the GridVis system service“ on page 88).

Then configure the communication port in the GridVis system service:

- On your computer, open the directory "etc" in the GridVisService directory "(C:)\Programs\GridVisService\etc" (path may vary depending on the directory structure of your computer!).
- Among other things, the "server.conf" file appears.



Step 4

- Open the file "server.conf" with a source code editor (recommendation: "Notepad++" – available as a free download on the web!).
- Add the command "-J-Dpasw-feature-grico-server-port=8082" in the line "default_options" (see following screenshot, item "★").

```
# $[HOME] will be replaced by user home directory according to platform
default_userid="orlGridVisData"

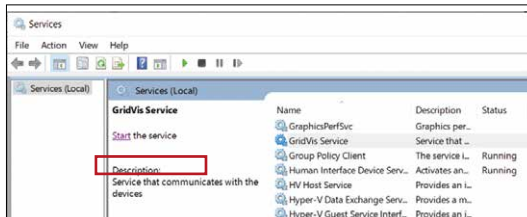
# options used by the launcher by default, can be overridden by explicit
# command line switches
default_options="--branding server --fork-java -J-Xms64m ★ -J-Xmx128m"
#-J-Doom.sun.management.jmxremote.port=3333 -J-Doom.sun.management.jmxremote.authentication=none -J-Doom.sun.management.jmxremote.ssl.enabled=false
#-J-Duiker.configuration=development
# for development purposes you may wish to append: -J-Djmsbeans.logger.console=true -J-es
# default location of JDK/JRE, can be overridden by using --jdkhome <dir> switch
#jdkhome="jre"

# @usage: paths separated by path separator (semicolon on Windows, colon on Unixes)
```

• Save the file.

Step 5

- The plug-ins are stored in the GridVis system service; start the GridVis system service.



7.6 Importing new measurement devices into the GridVis® Collector

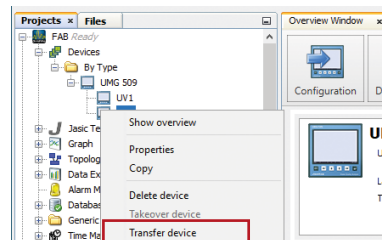
The following example shows the **import of new measurement devices** into the GridVis® Collector. **Measurement device names that have been changed** are also transferred to the GridVis® Collector in this way.

In contrast to commissioning, you do not need a USB flash drive for the data transfer.

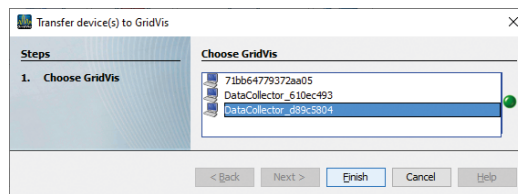
Step 1

Integrate the new measurement device "UV2" from the GridVis software into the GridVis® Collector.

- Right-click on the new measurement device in the GridVis software.
- In the drop-down menu, select the item "Assign device".



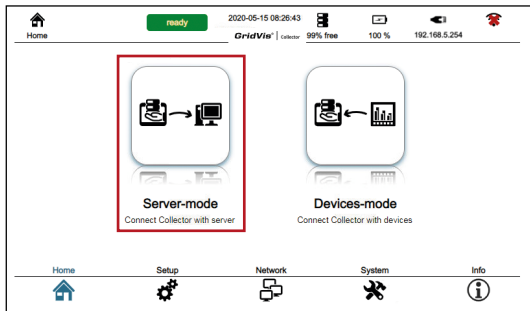
- The "Transfer devices to a GridVis" window appears.



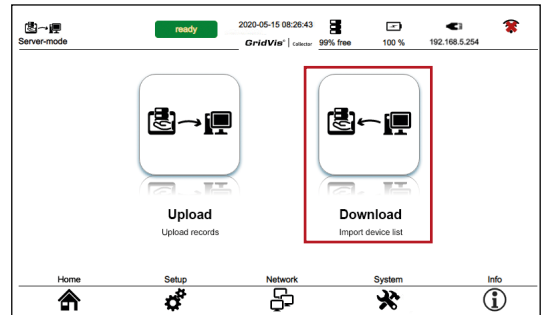
- Select the GridVis® Collector. If you have several GridVis® Collectors installed, please note the "Collector ID". Check the "Collector ID" in the "Info" menu of your GridVis® Collector.
- Click the "Finish" button.

Step 2

- Then connect the GridVis® Collector to the network (of the GridVis software).
- In the GridVis® Collector, open the "Server mode" by pressing the button.



- In server mode, press the "Download" button.



- The GridVis® Collector synchronizes the list of measurement devices from your GridVis project.

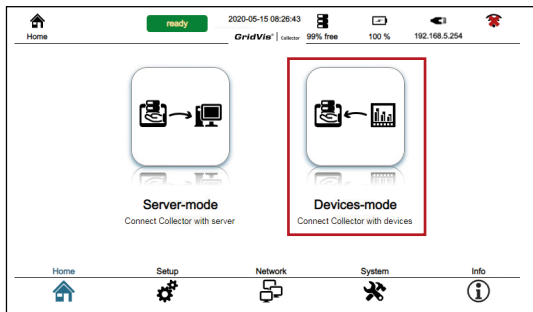
NOTE

The GridVis® Collector restarts automatically after synchronization.

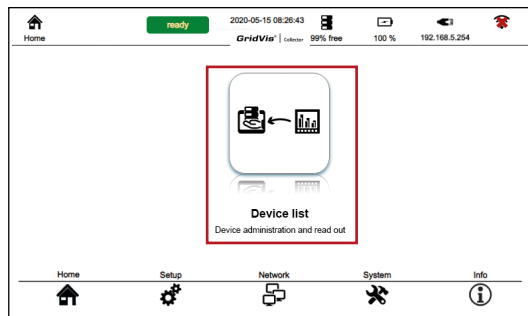
Step 3

After the restart, check the synchronization of the measurement device list in the GridVis® Collector:

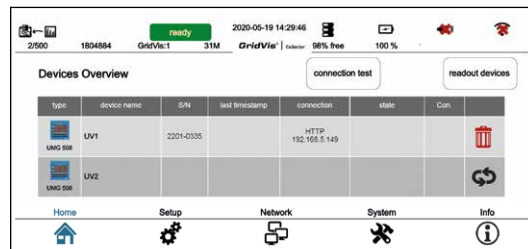
- On the start page of the GridVis® Collector user interface, select the "Device mode".



- In the "Device mode" press the "Device list" button.



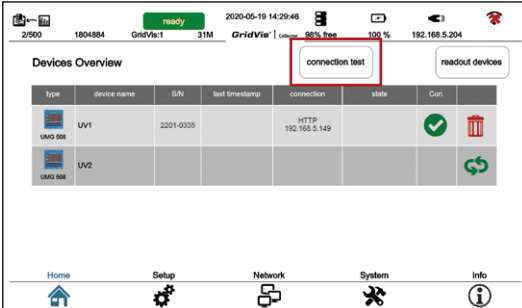
- The list of measurement devices appears on the user interface of the GridVis® Collector. As no measurement device is connected, this process may take a few seconds.



- Measurement devices already connected to the GridVis® Collector (see "binding" in section "Reading out measured values" on page 89) are marked by the system with a "Trash can icon" in the last table column (e.g. UV1).
- Measurement devices that have been newly created in the GridVis software (e.g. UV2) appear in the last table column with a "black assignment symbol".

Step 4

- First connect the on-site measurement device "UV1" with the GridVis® Collector.
- When the "Connection test" button is clicked, the GridVis® Collector detects measurement device "UV1" and in the measurement device list marks measurement device "UV1" with a "green check mark" in the "Connection" column. No further "binding" is possible.
- Additional measurement devices not yet connected by "binding" (e.g. UV2) appear in the last column of the table with a "green assignment symbol".



The screenshot displays the GridVis Collector interface. At the top, there is a status bar with a green "ready" indicator, the date and time "2020-05-19 14:29:46", and system information like "2/500", "1804884", "GridVis 1", "31M", "GridVis Collector", "98% free", "100%", and "192.168.5.204". Below this is the "Devices Overview" section, which includes a "connection test" button (highlighted with a red box) and a "readout devices" button. The main part of the interface is a table with the following data:

type	device name	SN	last timestamp	connection	state	Con.
UMG 888	UV1	2201-0335		HTTP 192.168.5.149		✓ 🗑️
UMG 888	UV2					🔄

At the bottom of the interface, there is a navigation bar with icons for "Home", "Setup", "Network", "System", and "Info".

Step 5

- Connect the new on-site measurement device "UV2" (see example) with the GridVis® Collector via the Ethernet connection or make sure that the measurement device "UV2" is physically connected (e.g. via a switch) with "UV1".
- Activate the "green assignment symbol" to connect the new on-site measurement device "UV2" with the GridVis® Collector.
- The following display appears on the GridVis® Collector:

link with device

type	id	name
UMG 508	2	UV2

manual installation

type	name	SN	IP-Address	transfer
UMG 508	UMG508 Patrick	22024254	192.168.5.65	↻
UMG 508	UMG 508	22001935	192.168.5.81	↻

Home Setup Network System Info

NOTE

The value in the "ID" table column corresponds to the identification number of the measurement device in the GridVis database and is used for information purposes.

- Once the GridVis® Collector has successfully connected the new on-site measurement device "UV2", a "green check mark" is placed in the "Connection" column.
- From this point on, the GridVis® Collector automatically recognizes the measurement device based on the serial number.

Devices Overview

connection test readout devices

type	device name	SN	last timestamp	connection	state	Con.
UMG 508	UV1	2201-0335		HTTP 192.168.5.149		🗑️
UMG 508	UV2	2200-1935		HTTP 192.168.5.81	✅	🗑️

Home Setup Network System Info

NOTE

Use the "Recycle Bin" icon to revoke the assignment of incorrectly assigned measurement devices. If measured values have already been read out from these measurement devices, these records must be deleted (in the GridVis® Collector via "Delete records" - section „7. 9. 1 Function of „Reset“ button“ on page 104). At the time this manual was printed, it was not yet possible to delete records from measurement devices individually.

7.7 Main menu item "Settings"

The main menu item "Settings" is used to configure the LCD brightness, time zone and language of your GridVis® Collector.

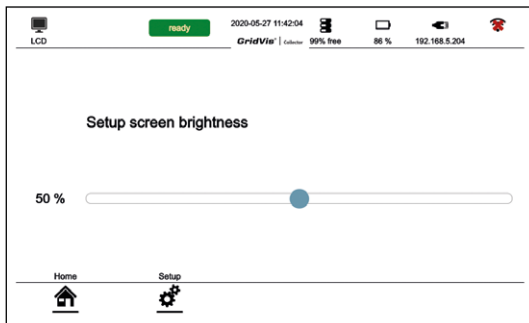
type	device name	S/N	last timestamp	connection	state	Con.
UMG 308	UV1	2201-0335		HTTP: 192.168.5.149	connection test	
UMG 308	UV2	2200-1905		HTTP: 192.168.5.81		

The Settings page displays three main configuration options:

- LCD**: Represented by a monitor icon.
- Timezone**: Represented by a globe icon.
- Language**: Represented by a person icon with a speech bubble.

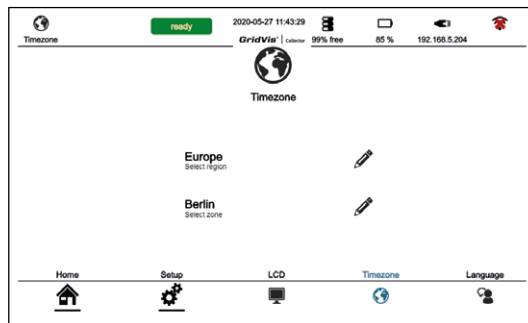
At the bottom, there are navigation icons for **Home** (house icon) and **Setup** (gear icon).

7.7.1 LCD brightness



- Use the "Screen brightness" slider to configure the backlight intensity of your GridVis® Collector.

7.7.2 Time zone



- Use the "Pencil" icon to select your time zone.
- Depending on the time zone, the GridVis® Collector calculates and stores the last readout time of your measurement devices in UTC format (Coordinated Universal Time).

2020-05-19 14:29:46
GridVis® Collector 98% free 100 % 192.168.5.193

Devices Overview

type	device name	S/N	last timestamp	connection	state	Con.
UMG 508	UV1	2201-0335	14.09.2015 11:00	HTTP 192.168.5.149	is read out 5 %	✓
UMG 508	UV2	2200-1930	14.09.2018 00:10	HTTP 192.168.5.51	is read out 0 %	✓

Home Setup Network System Info

7.7.3 Language

2020-05-27 11:44:51
GridVis® Collector 99% free 84 % 192.168.5.204

Language-Settings

Deutsch

English

Home Setup LCD Timezone Language

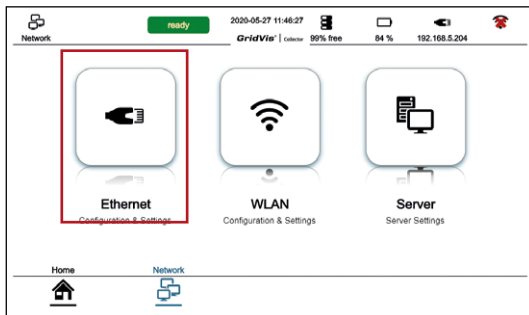
- Pressing the corresponding button changes the language of the GridVis® Collector user interface.
- The GridVis® Collector allows a language change while in operation.
- A language change does not require a restart of the GridVis® Collector.

7.8 Main menu item “Network”

7.8.1 Ethernet

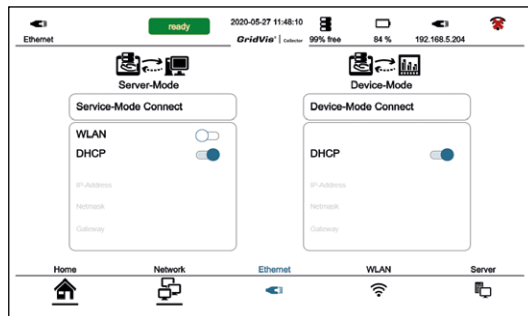
The GridVis® Collector supports 2 Ethernet settings for different **IP address ranges**:

1. A company network with the computer running the GridVis software.
2. Measurement devices on site (e.g. transformer station).



In addition to transmission via Ethernet, data can also be transferred between the GridVis® Collector and the GridVis software in the **company network (server mode)** via WLAN. In this case:

- Before the data transfer, switch the “Network” to WLAN in the main menu.
- The Ethernet connection (RJ45) is disabled and data synchronization via the Ethernet connection is not possible.



Depending on the Modbus communication protocol, the GridVis® Collector automatically switches between the Ethernet IP address ranges.

The buttons “Service Mode Connect” and “Device Mode Connect” allow the user to switch manually as well (in the main menu “Network” under the menu item “Ethernet”).

In addition, the combination of data synchronization between the GridVis® Collector and the company network (computer with the GridVis software) also works **via WLAN** and the on-site measurement devices **via Ethernet**.

For company networks with a DHCP server, the GridVis® Collector obtains the IP address automatically. To enable this, activate the "DHCP" slider in Server mode.

NOTE

Ask your network administrator whether your company network uses a DHCP server.

In some cases your network administrator may need the MAC address of the GridVis® Collector. The MAC address can be found in the menu item "Info".

ATTENTION

Material damage due to incorrect network settings. Incorrect network settings can cause faults in the IT network!
Consult your network administrator for the correct Ethernet network settings.

7.8.2 WLAN

NOTE

Please note that certain functions of the GridVis® Collector, such as WLAN, may be restricted or deactivated by country-specific regulations!

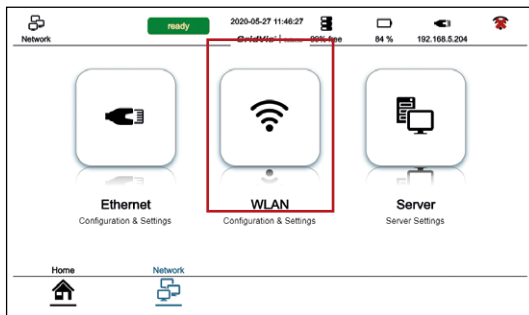
NOTE

Data synchronization via WLAN:

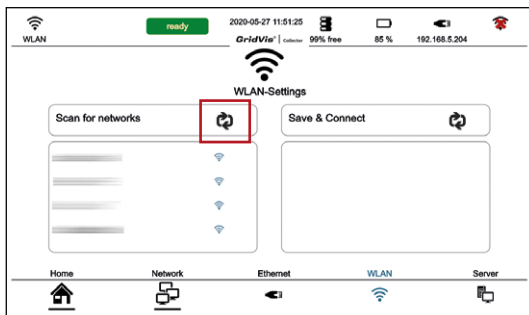
- Only works in the company network with the computer running the GridVis software!
- Does not work on the measurement devices on site (e.g. transformer station).

Data synchronization with the GridVis database via **WLAN**:

- Press the "WLAN" button in the GridVis® Collector user interface.



- The "WLAN settings" window appears.



- To search for networks in the 2.4 GHz WLAN range, press the button "Scan for networks".
- The GridVis® Collector displays existing WLAN networks and their field strength (blue field strength symbols).

NOTE

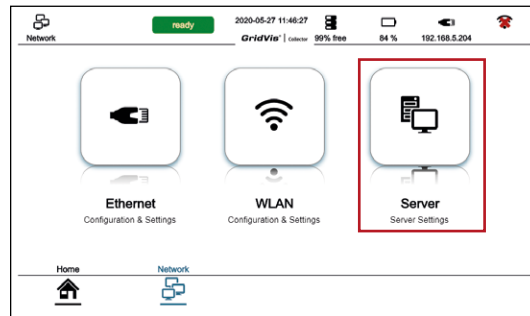
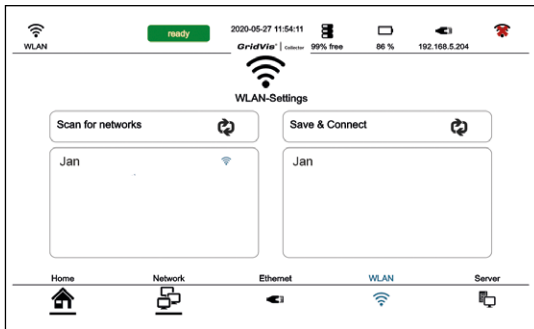
The WLAN antenna is integrated in the GridVis® Collector and the WLAN data transmission is intended for short distances (≤ 10 m).

Data reception via WLAN between the GridVis® Collector and WLAN router is restricted in the following cases:

- distances which are too great and
- troublesome obstacles, such as thick walls.

After the GridVis® Collector has found WLAN networks:

- Select the button of your WLAN network.
- Press the "Connect" button.
- In the right-hand window, configure the settings for authentication and encryption of your WLAN network.



The GridVis® Collector supports the following settings:

Authentication:

PEAP (with MSCHAPv2), TSL, TTLS.

Encryption:

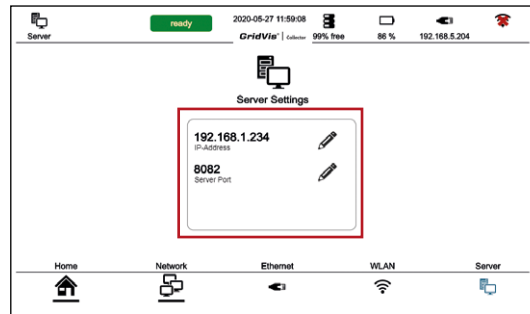
Open, WEP, WPA2 (with CCMP and TKIP support).

7. 8. 3 Server

Use the "Server" button to change server settings later on, such as

- the GridVis server IP address
- the communication port for the data exchange with the GridVis software or

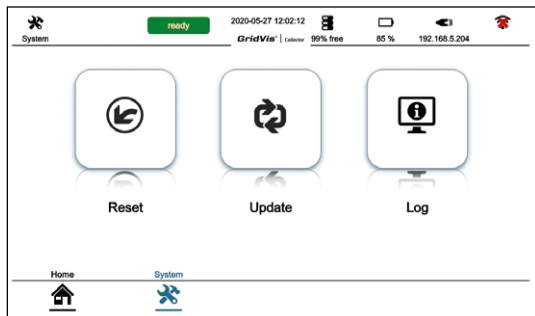
(see also section „6. 2 Configuring the GridVis® Collector in the GridVis software“ on page 50).



7.9 Main menu item "System"

The main menu item "System" gives you access to functions such as:

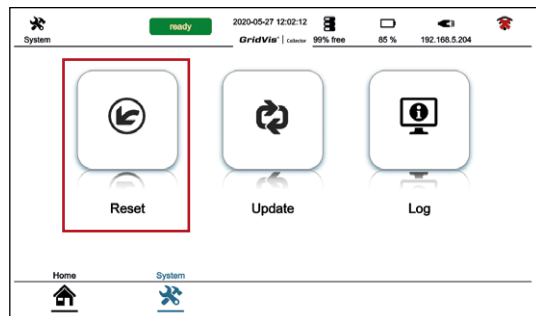
- Resetting the GridVis® Collector to the factory settings.
- Deletion of records.
- Updating the firmware.
- Opening a log file (event log file) for fault analysis.



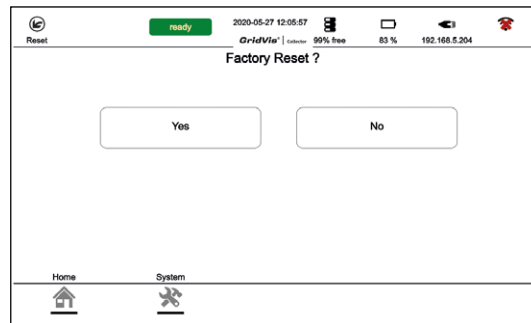
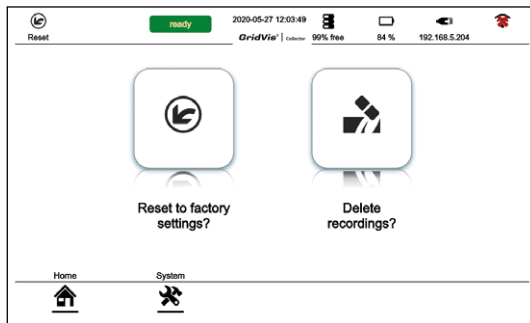
7.9.1 Function of "Reset" button

The "Reset" button in the "System" window takes you to the area in which:

- The GridVis® Collector can be reset to the factory settings.
- Records can be deleted.



- Press the "Reset" button.
- The "Reset" window appears with the buttons "Reset to factory settings?" and "Delete records?".



The "Reset to factory settings?" button

- Press the "Reset to factory settings?" button
- The "Reset" query window appears with the buttons "Yes" and "No".

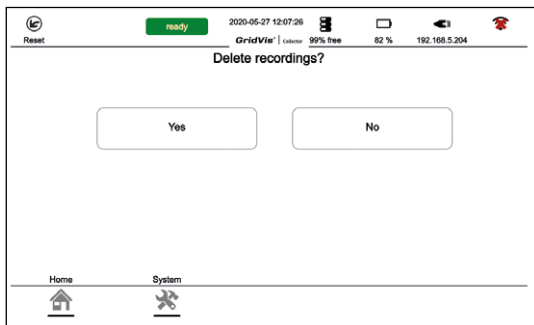
NOTE

When the "Yes" button is pressed:

- The GridVis® Collector is set to the default factory settings.
 - The GridVis® Collector deletes all settings and measurement data.
-
- Pressing the "No" button takes you back to the "Reset" window with the buttons "Reset to factory settings?" and "Delete records?"

The "Delete records?" button

- Press the "Delete records?" button
- The "Delete" query window appears with the buttons "Yes" and "No".



NOTE

When the "Yes" button is pressed:

- The records in the data memory of the GridVis® Collector are deleted. This process can take a few minutes!
- None of the records on the measurement devices are deleted!
- The last readout time is not reset! If a measurement device is then read out again via the GridVis software, the data readout is carried out from the last readout time. This means the user of the GridVis® Collector has more data storage available for the next readout procedure.

The GridVis® Collector does not delete settings such as IP addresses, measurement devices, etc.!

- Pressing the "No" button takes you back to the "Reset" window with the buttons "Reset to factory settings?" and "Delete records?"

7.9.2 Function of "Update" button

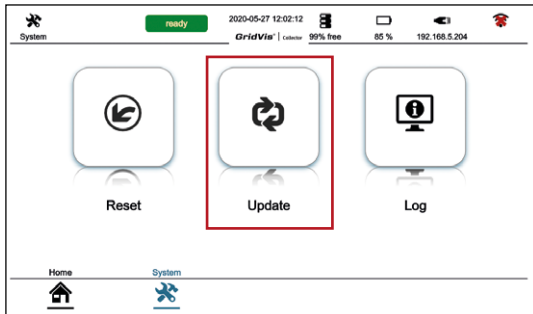
The "Update" button is used to update the firmware of the GridVis® Collector.

The "**Firmware update**" takes place:

- Online via the Internet.
- Using port 80 of your company network.

NOTE

- Inform your network administrator or your IT department before performing a firmware update.
- Your IT department needs to enable port 80 of your company network before a firmware update.
- Connect the GridVis® Collector to your company network via Ethernet or WLAN.
- The GridVis® Collector uses the IP address settings of the Server mode for the firmware update.



- Press the "Update" button.
- The "Update" window appears with the button "Scan for updates."

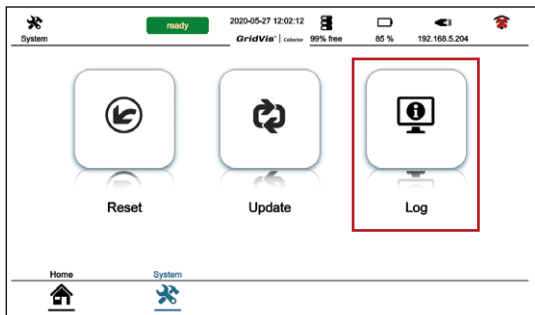


- Press the "Scan for updates" button. The GridVis® Collector searches for firmware updates on the Janitza server via the Internet connection (port 80 - company network).
- If the GridVis® Collector finds a firmware update, start the update procedure and follow the instructions.

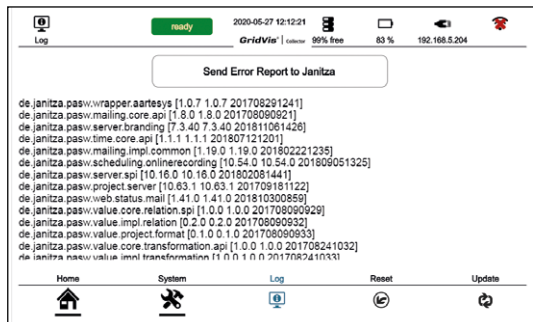
7.9.3 Function of "Log" button

The GridVis® Collector stores important events in an event log file called the "Log file".

The log file is used by the support department of Janitza electronics GmbH for fault analysis.



- Press the "Log" button.
- The "Log" window appears with the event log.



NOTE

Use the "Send log file" button to send the event log (error report) to Janitza support. Please note that your GridVis® Collector requires an Internet connection (with an open port 80 - company network) (see section „7.9.2 Function of „Update“ button“ on page 106)!

8. Clock/Battery

The internal clock of the GridVis® collector is supplied with power by the lithium-ion battery.

When the GridVis® Collector is switched off, an additional soldered-in battery supplies power to the clock.

8.1 Clock

The GridVis® Collector is delivered with the clock configured and it can be synchronized during operation by an NTP server (Network Time Protocol – standard for the synchronization of clocks in computer systems).

An NTP server of the PTB (Physikalisch-Technische Bundesanstalt - ptbtime1.ptb.de) synchronizes the time whenever the GridVis® Collector connects to the Internet.

NOTE

To synchronize the internal clock of the GridVis® Collector, your company firewall must enable the address "ptbtime1.ptb.de".

Contact your system administrator for this enable and for the correct settings!

The accuracy of the internal clock is +/-15 s per month at a temperature of 0 °C to 40 °C (32 °F to 104 °F).

Function planned for mid-2019:

The clock provides date and time information to configure the time of the measurement devices.

8.2 Battery

The typical battery life is 5-8 years. As with the lithium-ion battery, it can only be replaced at the factory.

9. Technical data

Part number	51.00.400	
CPU	ARM Cortex	
Main memory	1 GB LPDDR2	
Measured value memory	60 GByte	
Open ports	80, 21, 502, 8082-8084 ¹⁾	¹⁾ ...Communication port, depending on the setting in the Collector/GridVis software configuration.
Operating system	Linux, Debian	
Required communication ports		
Open ports	80, 21, 502, 8082	Communication port, depending on the setting in the Collector/GridVis software configuration.
Data exchange with the GridVis software	80, 8082	Communication port for the initial installation.
Send error report to Janitza Support	80	Is performed via http
Read the measurement devices	80, 21, 502	
Synchronize the internal clock with an NTP server on the Internet	123/UDP	ptbtime1.ptb.de
Display		
	Type	7" TFT
	Luminosity	250 cd/m ²
	Viewing angle	140 degrees horizontal, 130 degrees vertical

	Resolution	800 x 480 pixels, RGB LCD
	Touch display	Capacitive, multi-touch (10 fingers)
	Colour	24-bit colour depth
	Service life of the backlight	20000 h
Rechargeable battery		
	Type	Lithium ion
	Capacity	3350 mAh
	Certification	UN83.3
	Type	Permanently installed, cannot be changed by the customer.
	Running time	Approx. 9 h at 50% backlight, Approx. 7 h at 100% backlight. These are approximate values and depend on the age and use of the battery (e.g. the battery running time decreases with a permanent WLAN connection).
	Charging time in off state	5 h
	Service life	80% - 300 cycles
	Maximum temperature range for "charging" (battery only)	0° C to 45° C (32° F to 113° F)
	Maximum temperature range (battery only)	-20° C to 65° C (-4° F to 149° F)
	Protection	BMS, PCM

WLAN 802.11b/g/n		
	Encryption	Open, WEP, WPA 2 (with CCMP and TKIP support)
	Authentication	PEAP (with MSCHAPv2), TSL, TTLS
	Frequency range	From 2.3995 to 2.4845 GHz
	Can be switched off	Yes
	Range	10 m
Ambient temperature		
	Operating temperature range	0° C to 40° C (32° F to 104° F)
	Temperature range, storage/transport	-10° C to +45° C (14° F to 113° F)
Recommendation: For a long service life, store the device at 22 to 28 °C (71-82 °F) in a dry environment!		
General		
	Relative air humidity	5% to 95% non-condensing
	Net weight	1250 g
	Protection class	IP20 according to EN60529
	Operating elevation	0 .. 2000 m above sea level
	Operating environment	Surfaces with clear contours and sufficient illumination (>15 lux)

	Dimensions	W270 mm x H247 mm x D91 mm
	Material of housing	ASA+PC+FR (UL 94 V-0)
Interfaces	USB 2.0.	
	Mini-USB charging port	USB-BC 1.2 specification (USB battery charging), charging at up to 1.5 A
	Ethernet connection	100Base-TX
Transport case	Dimensions	W464 mm x H176 mm x D366 mm
	Waterproof, dust-proof	IP67 certified
	Automatic pressure compensation valve	
	Net weight	3340 g
USB charger		
	Input	100-240 V, 50-60 Hz, 0.7 A
	Output	5 V DC, 2.4 A
Clock battery		
	Battery (soldered in)	BR 1632, 3 V
	Typical service life	5-8 years

10. Maintenance and care

10.1 Maintenance

- This device is to be installed, operated and maintained exclusively by qualified personnel with electrical training and experience.
- Regarding defective devices, please note section „1.5 Defective device/disposal“ on page 7.
- For a long service life, store the GridVis® Collector in a dry environment at temperatures of 22 to 28 °C (71-82 °F).

10.2 Care

ATTENTION

Material damage due to incorrect maintenance of the GridVis® Collector.

The use of water or other solvents, such as denatured alcohol for the display, can damage or destroy the device, display and accessories during cleaning. Water can penetrate into the device housing and destroy the device (battery), for example.

- Clean the housing, the display and accessories, especially the power supply unit, of the GridVis® Collector only with a dry microfibre cloth.
- If the housing or accessories are very dirty, use a microfibre cloth moistened with clear water.
- Clean the display, e.g. of fingerprints, with a special LCD cleaner and a lint-free microfibre cloth.

**WARNING****Warning against contact of the device (batteries) with moisture, water, fire, explosions, oils, acids, alkalis, gases, vapours, dust and radiation!**

This can lead to a chemical reaction and to a defect of the device (material damage), or even personal injury in case of fire or explosion.

- Protect the device (the battery) from the above-mentioned substances and use the transport case for storage.
- Observe the limits for storage and transport of the device (see section „9. Technical data“ on page 110).
- Observe the information for maintenance and care of the device.

Janitza[®]

Janitza electronics GmbH
Vor dem Polstück 6
D-35633 Lahnau

Tel.: +49 6441 - 9642-0

Fax: +49 6441 - 9642-30

Email: info@janitza.de

info@janitza.de | www.janitza.de