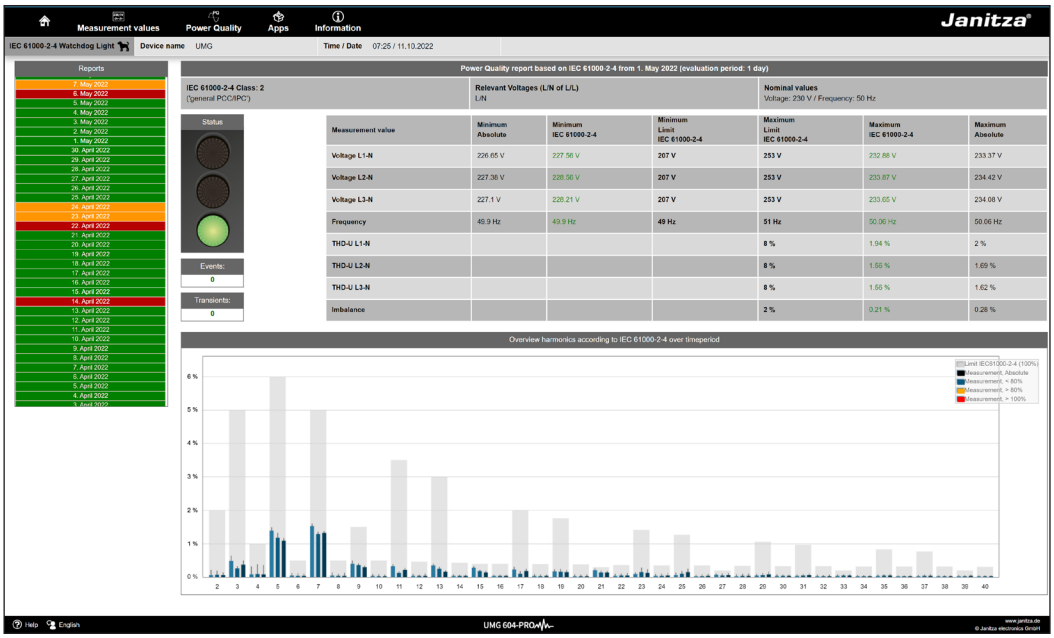
Functional description

IEC 61000-2-4 Watchdog Apps

for UMG 604-PRO, UMG 605-PRO, UMG 509-PRO, UMG 512-PRO



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www.janitza.com

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

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Inhalt

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Comments on the manual

Your comments are welcome. If anything in this manual seems unclear, please let us know and send an EMAIL to: info@janitza.com

ATTENTION
Observe the operating manual for the installation and operation of the device!

Meaning of symbols

Display of warning notices and safety information

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

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

This general warning symbol draws attention to a possible risk of injury. Be certain to observe all of the information listed under this symbol in order to avoid possible injury or even death.

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:

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

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

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

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

INFORMATION

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

The "IEC 61000-2-4 Watchdog" app

Standard IEC 61000-2-4 specifies numerical compatibility levels for industrial and non-public power distribution systems at rated voltages up to 35 kV. To ensure faultless functioning of the installed system requires that the power quality in all critical technical systems be monitored continuously in accordance with standard IEC 61000-2-4.

Brief description

Once the "IEC61000-2-4" app is installed on your Janitza meter, you will be able to view reports created using standard IEC61000-2-4. The reports allow you to check the power quality and react to possible deviations on an ongoing basis.

Key features:

- Integrated watchdog functionality according to standard IEC 61000-2-4
- Daily or weekly reports are possible
- No need to transfer large amounts of measurement data from the measurement device to the host system
- Enables customization of the settings for your electrical network and class
- Simple analyses with integrated traffic light principle
- Savings in communication costs to remote applications
- Execution of PQ analyses possible without special knowledge of power quality

INFORMATION

The auxiliary voltage of the device must be buffered so that voltage breakdowns can be reliably detected as events.

Integrating the Power Analyzer in GridVis

Integrating the Power Analyzer into the GridVis evaluation and configuration software requires that an Ethernet connection to the device be established and the device TCP/IP address be specified.

- Establish a connection between the PC and the device using a direct connection or via a switch/router (see connection examples). We recommend using at least CAT5 cable.
- Specify or set the addressing mode ("Fixed IP" or "DHCP"). Set the device TCP/IP address if the "Fixed IP" mode is selected.

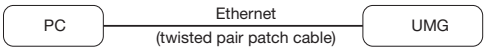


Fig. Connection example:
Direct connection between UMG and PC. Both devices require a fixed IP address.

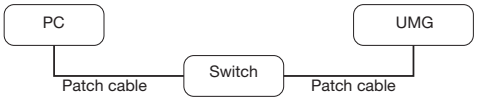


Fig. Connection example:
Setup via a switch. UMG and PC require a fixed IP address.

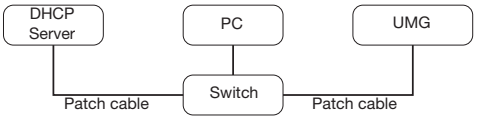


Fig. Connection example:
Integration in a network with a DHCP server. The UMG and PC are automatically assigned the IP address by a DHCP server.

Fixed IP address

In simple networks without a DHCP server, the network address must be set directly on the device.

For a PC-UMG direct connection, please note:

- Use a twisted pair patch cable (cross patch cable)
- The first three segments of the IP address should be the same on the device and the computer. The last segment must be different! The subnet mask must match in all four blocks.

  Example:

  IP address of the computer: 192.168.000.020 with the subnet mask: 255.255.255.0

  IP address of the UMG: 192.168.000.021 with the subnet mask: 255.255.255.0

DHCP mode

With DHCP, fully automatic integration of a UMG into an existing network is possible with no additional configuration. At startup, the UMG automatically obtains the IP address, the netmask and the gateway from the DHCP server.

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

Integrating a UMG 604-Pro and UMG 605-Pro

- Set the device to programming mode. To do so, press buttons 1 and 2 simultaneously for about 1 second. If the password request is deactivated, the programming mode is then started and indicated with the text "PRG". The first digit of the address blinks.
- Set the address to 205 to select "**DHCP mode**" (=2) or "**Fixed IP address**" (=0).
  - To do so, use button 2 to set the first digit to the value 2. Then use button 1 to go to the second digit and set it to the value 0 using button 2. Set the third digit to the value 5 in the same manner.
  - Once the address is set, go to the parameter using button 1. Use button 2 to set the parameter to the corresponding value (see the "Addressing mode" table).
  - For further settings, press button 1 to return to the input of the next address.
  - If no button is pressed for approx. 60 seconds, or if buttons 1 and 2 are pressed simultaneously for approx. 1 second, the programming mode is exited and the device returns to the display mode.

Addr.	Designation			
205	DHCP mode 0 = **fixed IP**	1 = BootP	2 = **DHCP client**	3 = Zeroconf

Tab. Addressing mode

- If "Fixed IP address" is selected, additional network parameters must be set:
  - Setting the device IP address
    - Enter the programming mode. Set the address to 300 as described and set the first block of three of the device IP address (see IP addresses table).
    - Then set the address to 301 and assign the second block of three of the device IP address.
    - Complete the entries using addresses 302 and 303.
  - Setting the subnet mask
    - Proceed the same way as for the device IP address settings to set the subnet mask using addresses 304 to 307 (see IP addresses table).
  - Setting the default gateway
    - Proceed in the same way to set the IP address of the default gateway (if present) using the addresses 310 to 313 (see the IP addresses table).
    - Note: Normally, no gateway setting is necessary for the configuration!
- Read out the device address when "DHCP mode" is selected:
    - Enter the programming mode as described. Use buttons 1 and 2 to set the address to 300 and note the block of 3 in the content area. Carry out this step analogously for addresses 301 to 303 (see table under step 10).

Addr.	Designation	Addr.	Designation	Addr.	Designation
300	IP address, xxx --- --- ---	304	IP mask, xxx --- --- ---	310	IP gateway, xxx --- --- ---
301	IP address, --- xxx --- ---	305	IP mask, --- xxx --- ---	311	IP gateway, --- xxx --- ---
302	IP address, --- --- xxx ---	306	IP mask, --- --- xxx ---	312	IP gateway, --- --- xxx ---
303	IP address, --- --- --- xxx	307	IP mask, --- --- --- xxx	313	IP gateway, --- --- --- xxx

Tab. IP addresses

Integrating a UMG 509-Pro and UMG 512-Pro

- Open the configuration menu from the home display using button 1 ("ESC"). Use button 3 to go to the item "Communication" and open it using button 6.
- Make the "DHCP" selection in the same way as above. To do so, select the "DHCP" item and open it using button 6. Select the corresponding item "DHCP" or "off" using button 3 or 4 and confirm this with button 6. Deactivate the item for networks with no DHCP server ("off").

- If the DHCP mode is deactivated ("off"), further network parameters must be set:

    - Setting the device IP address
        - Select the "Address" item using button 3 or 4 and open it using button 6. Change the first digit of the address using button 3 or 4. Then use button 5 to go to the second digit and set it in the same way as above. Complete the IP address and confirm the entries with button 6.
    - Setting the subnet mask
        - Select the "Netmask" item using button 3 or 4 and open it using button 6. Proceed the same way as for the device IP address settings to set the subnet mask.
    - Setting the default gateway
        - Select the "Address" item using button 3 or 4 and open it using button 6. Proceed in the same way to set the IP address of the default gateway (if present).
        - Note: Normally, no gateway setting is necessary for the configuration!

- Reading out the device address:

    - Open configuration menu from the home display using button 1 ("ESC"). Use button 3 to go to the item "Communication" and open it using button 6.
    - Make a note of the addresses found under "Address" and "Netmask".

Setting the IP address of the computer for a direct connection

Usually, PCs in a company network are operated with DHCP. If you want to assign a fixed IP address for the PC (e.g. for a direct connection between PC and UMG), please proceed as follows:

ATTENTION

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

INFORMATION

The auxiliary voltage of the device must be buffered so that voltage breakdowns can be reliably detected as events.

- Open the Network and Sharing Center in the Control Panel.
- Open the status window via LAN Connection (Fig. Network and Sharing Center).
- A fixed IP address for the PC can be assigned via Properties
  (see Fig. Procedure for setting a fixed IP address under Windows 10)

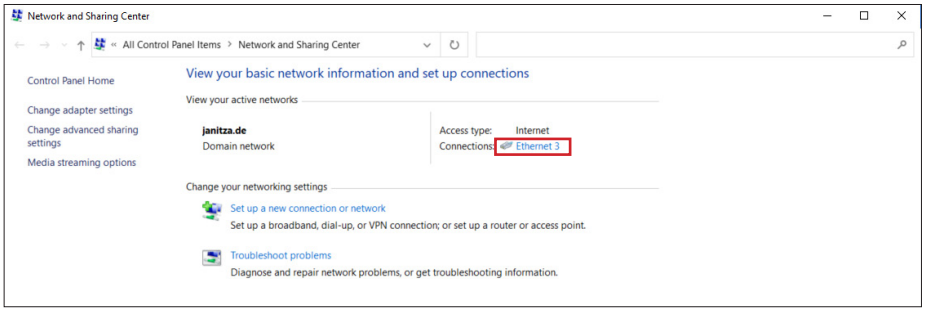


Fig.: Network and Sharing Center

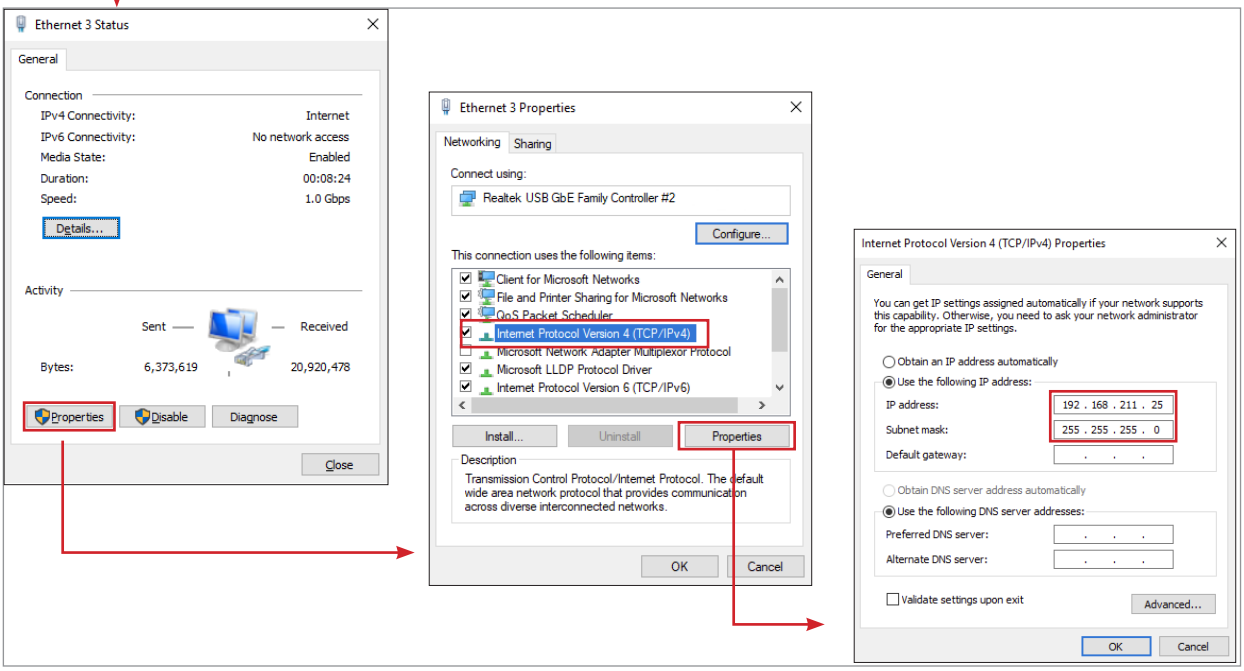


Fig.: Procedure for setting a fixed IP address under Windows 10.

Integrating the device into the GridVis software

- Open the GridVis software and load or create a project.
- Open the "Devices" node in the Projects window and activate the context menu by right-clicking on the "Devices" node.
- Select the context menu item "New" and click on "Other" to get to the device overview (see Fig. "Add new device").

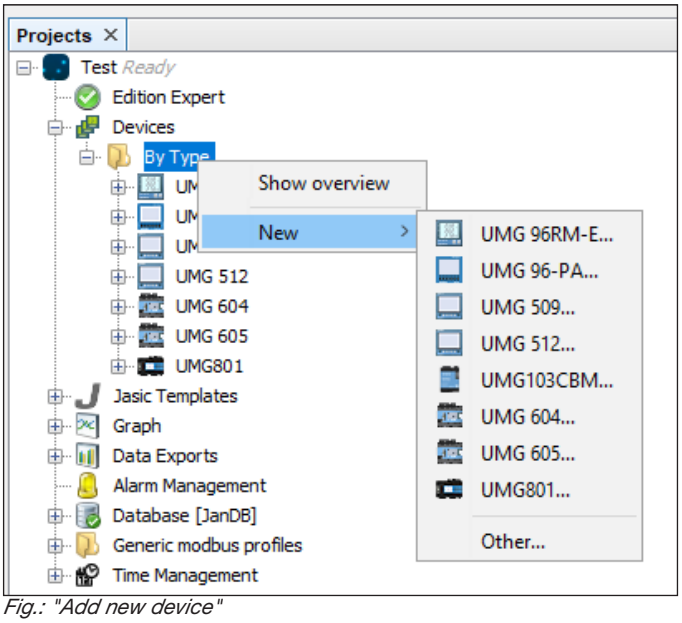


Fig.: "Add new device"

- Select the device type under the device category and confirm the selection with "Next".

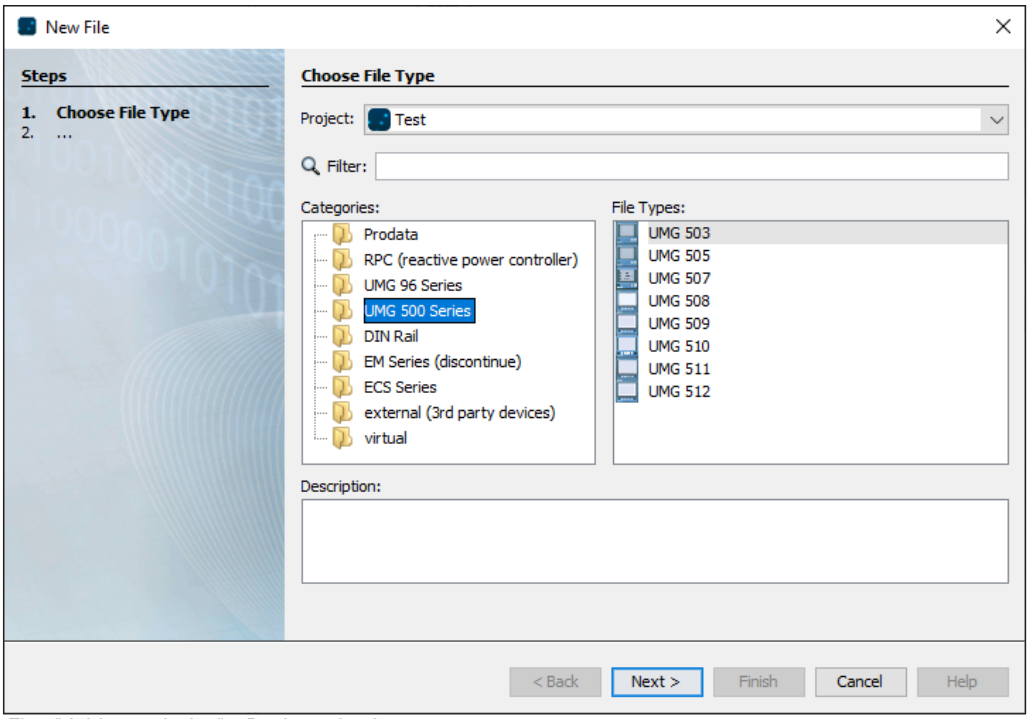


Fig.: "Add new device" - Device selection

- Set the connection type to "TCP/IP" and enter the corresponding device IP address (see chapter „Integrating a UMG 604-Pro and UMG 605-Pro“ or „Integrating a UMG 509-Pro and UMG 512-Pro“)

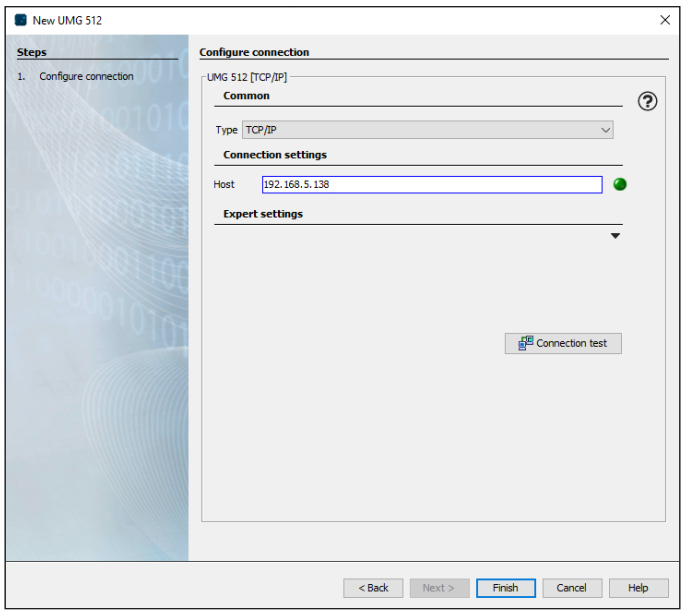


Fig.: Configuring the device connection

- After entering the device IP address, perform a connection test. If there is a connection to the UMG, device information - such as the serial number - is displayed. The device can now be used and configured within the software.

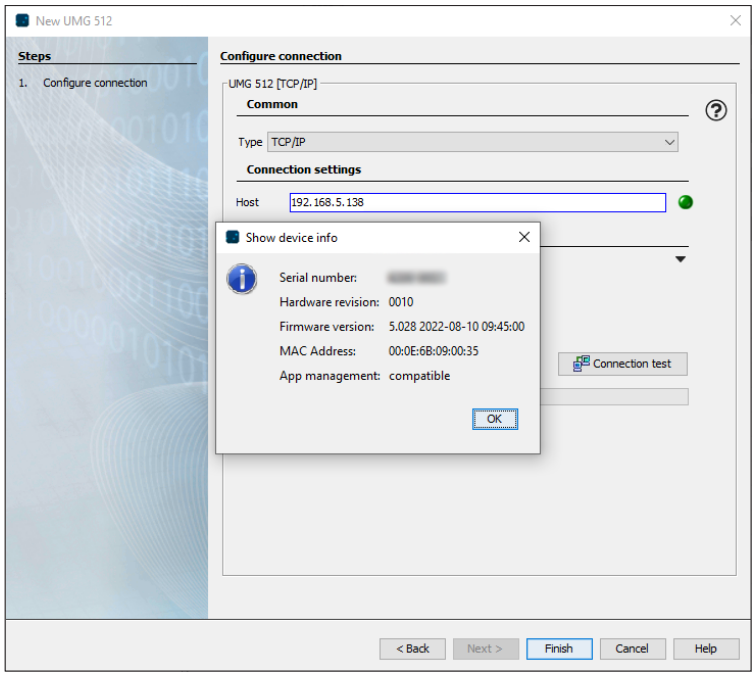


Fig.: Successful device connection test

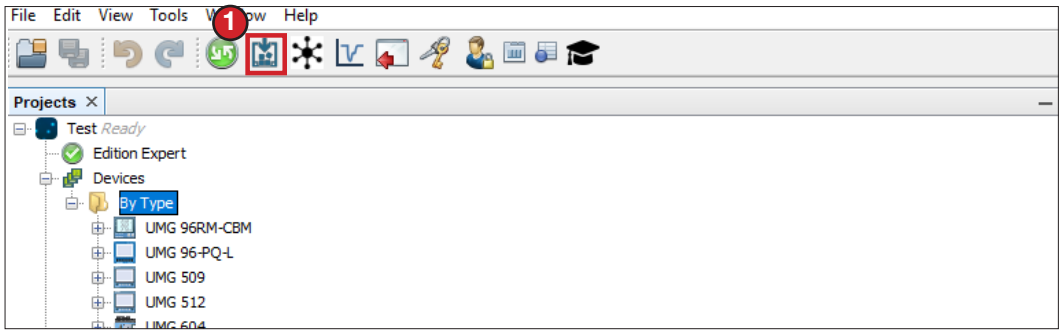
INFORMATION

Further information on how to use the GridVis software can be found on the Internet at:

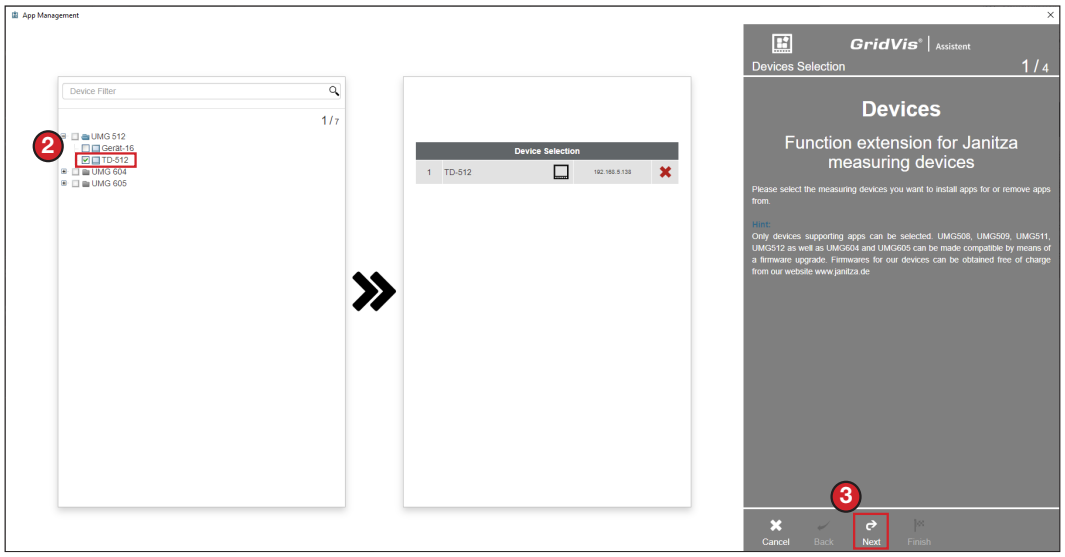
https://wiki.janitza.de/

App installation

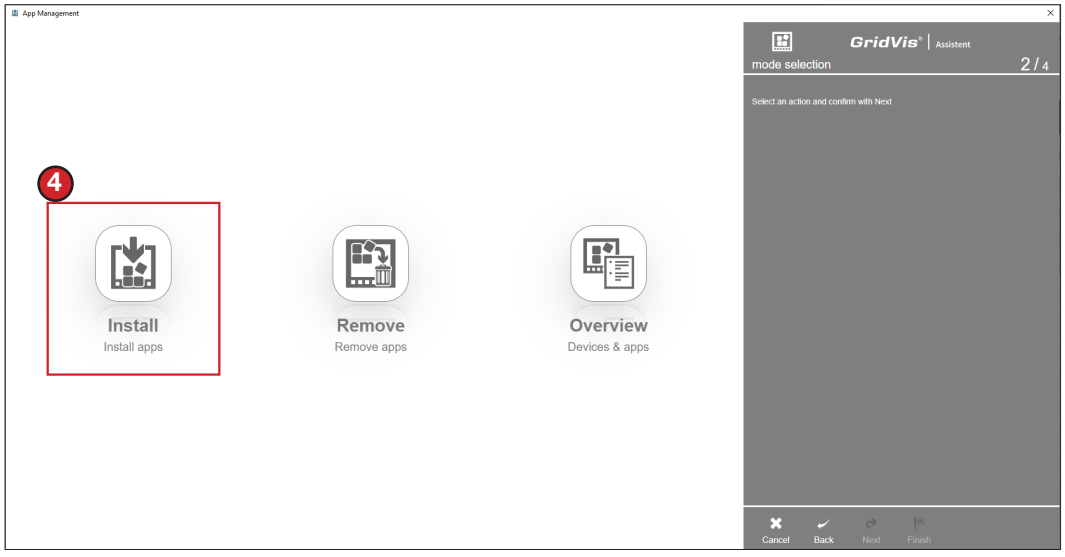
- To install the app, start the GridVis software. In the menu, click the icon .



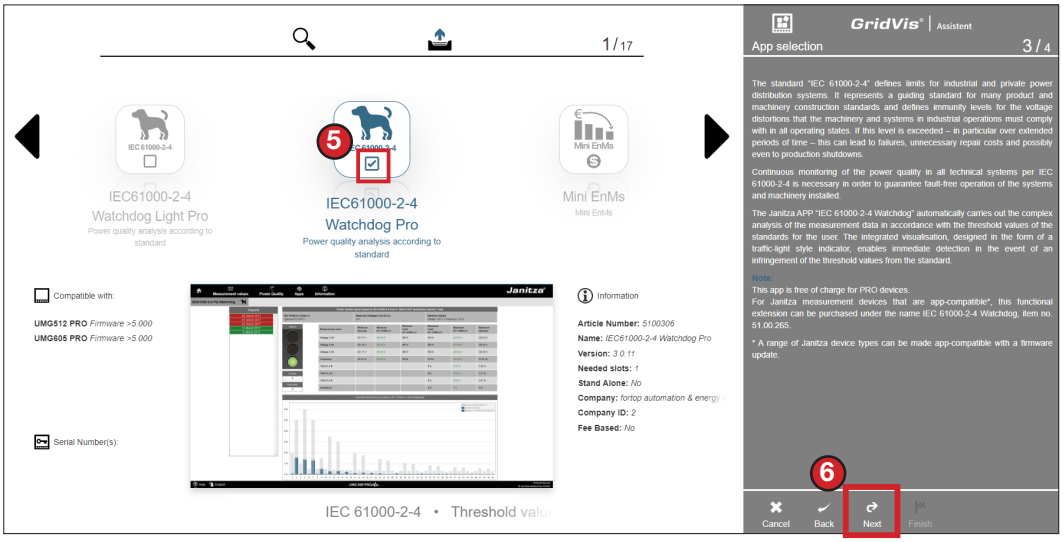
- Select the appropriate device in the tree and click "Next".



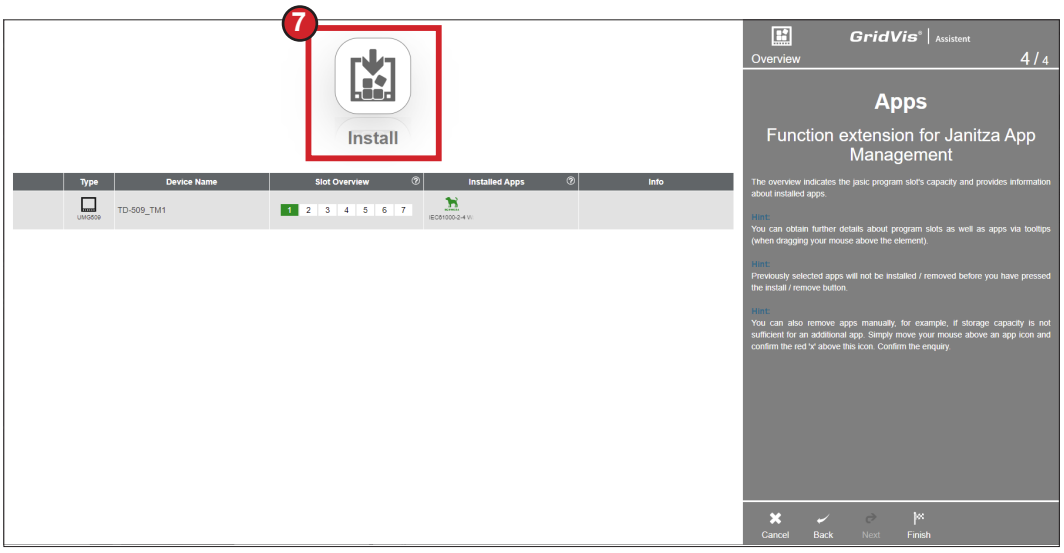
- In the following menu, click "Install".

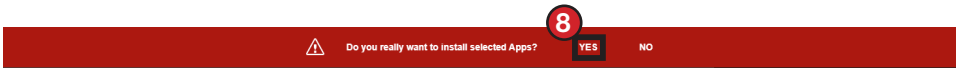


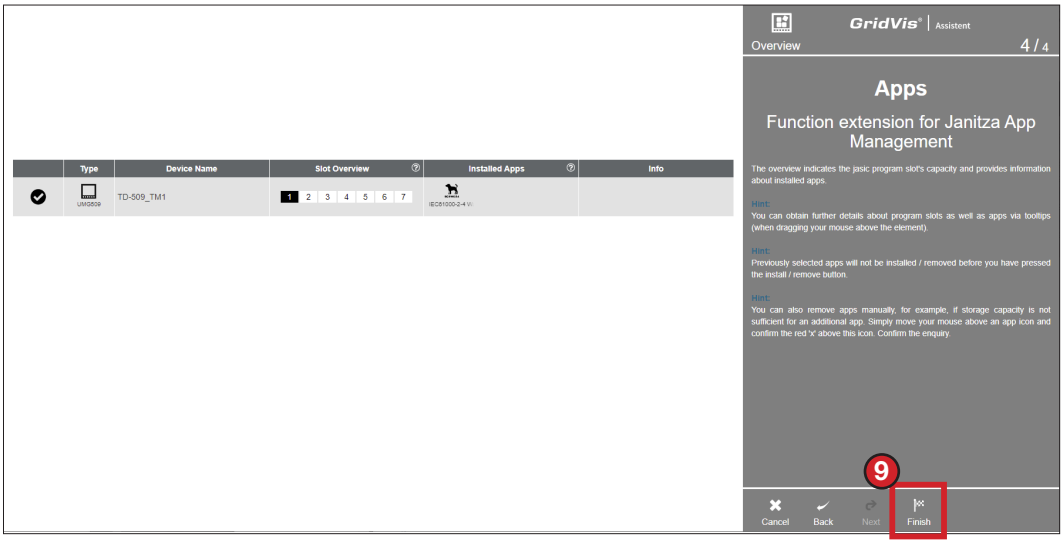
- Select the app you want and click "Next".
  The devices compatible to the apps are shown at the lower left.



- Now click "Install" and confirm the subsequent question with "YES".

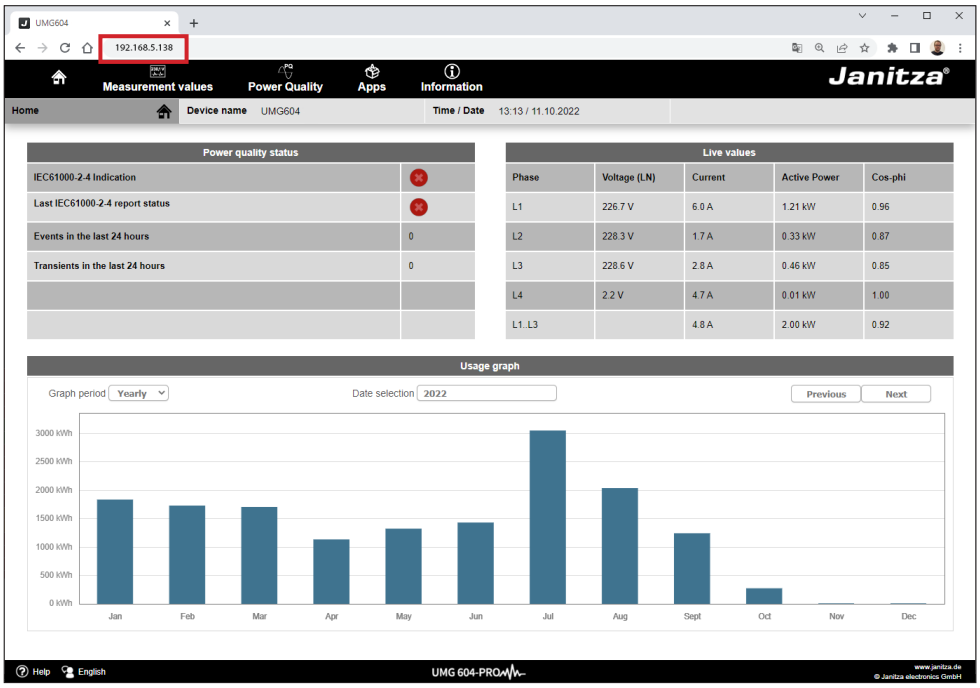




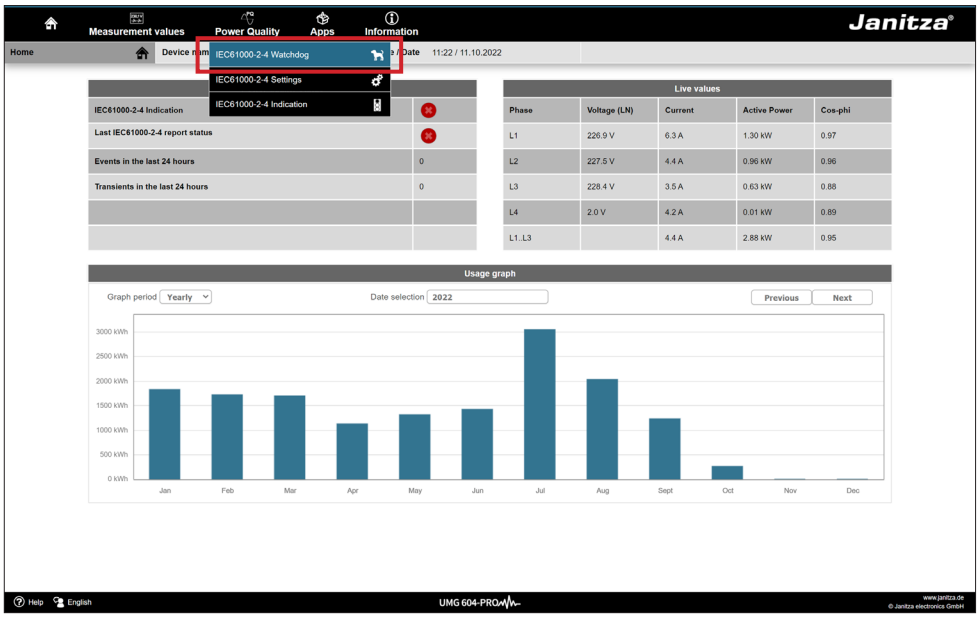


Access to the app

- You can access the app via the meter's website. Simply enter the IP address of the meter in your web browser.
- Example: Your meter has the IP address 192.168.5.138 Enter 192.168.5.138 in the address line of your browser.



- The installed "IEC61000-2-4 Watchdog" app can be found under the menu item "Power Quality".



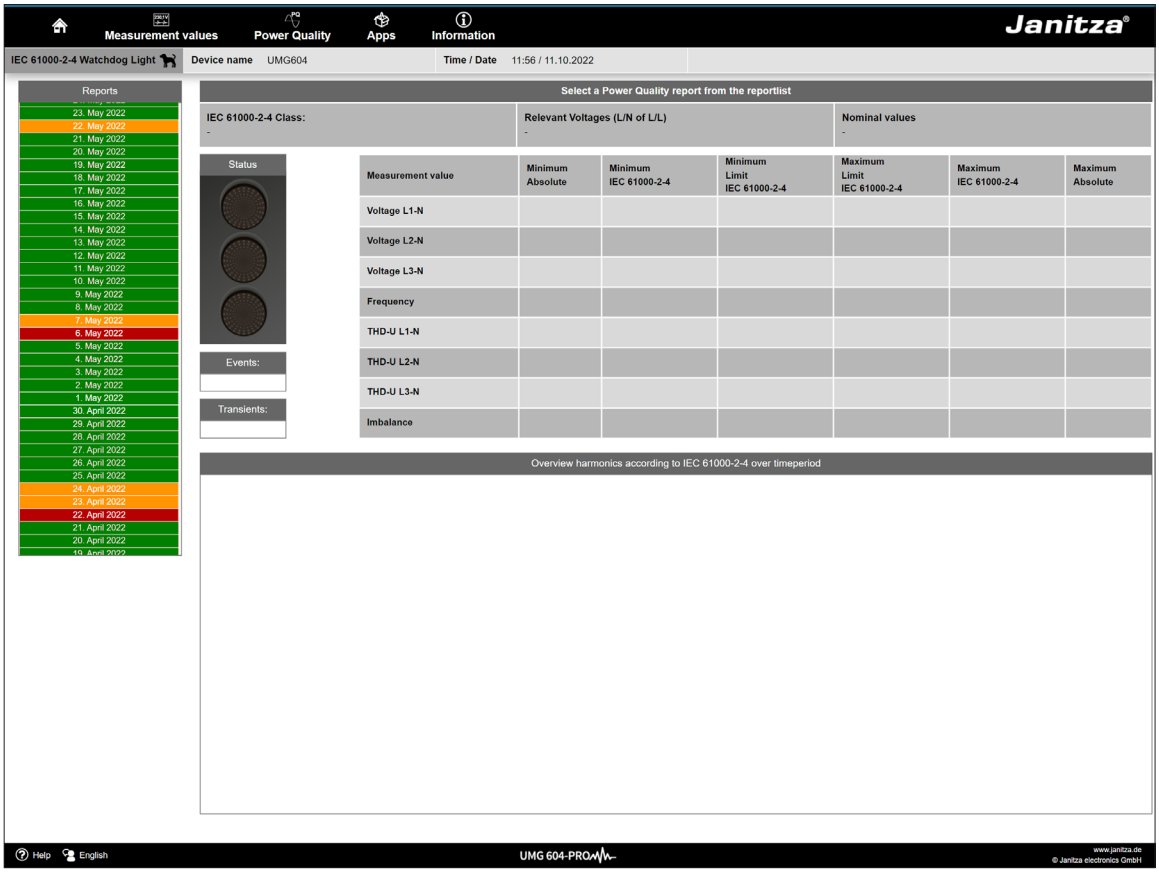
- Clicking on the "IEC 61000-2-4" app loads it automatically.

Basic app functions

- The following chapter describes the basic functions of the IEC 61000-2-4 app.

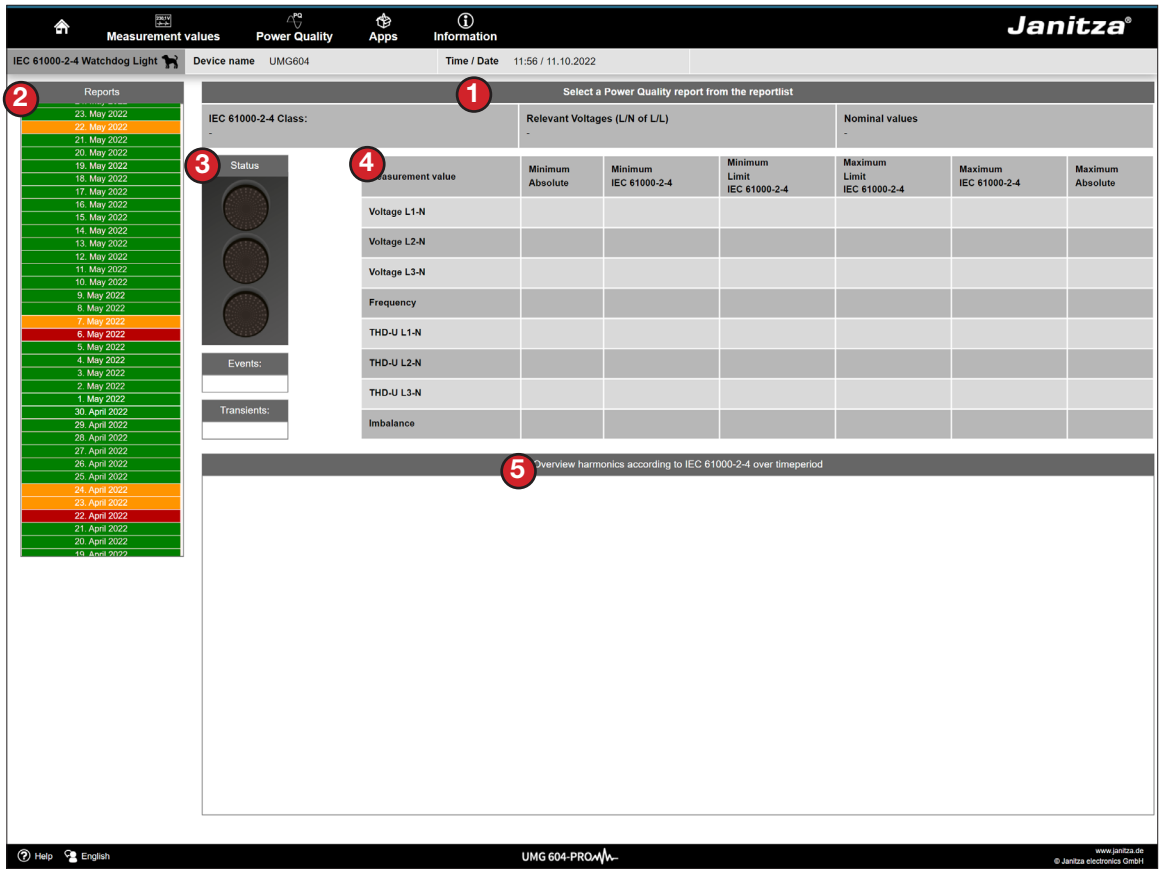
Opening the app

- The following screen appears after the app is started.



- This screen is the starting point for the reports. When one of the reports on the left side of the screen is clicked, its values are displayed in the overview screen.

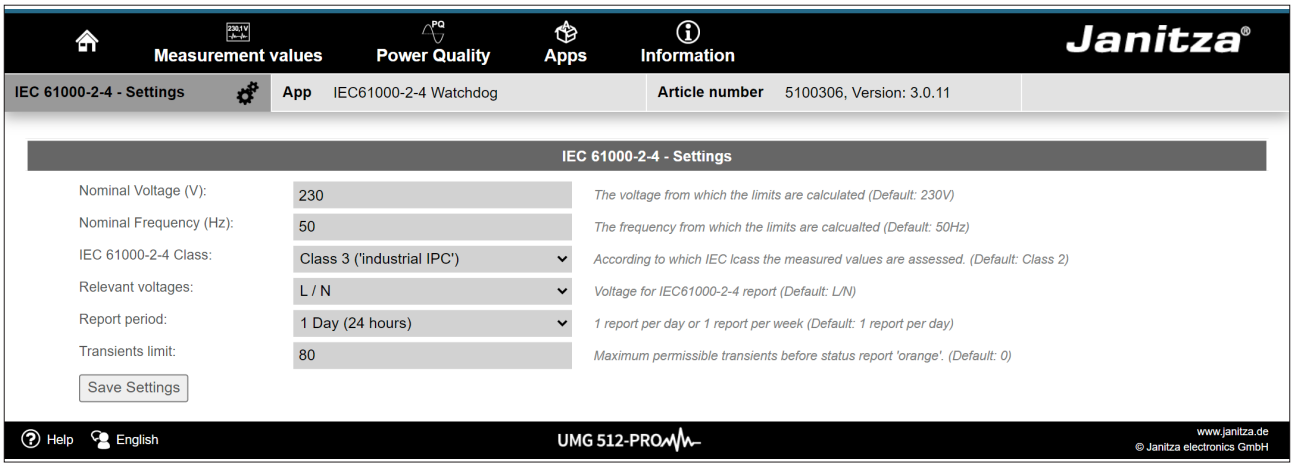
Screen layout



- The screen is divided into 5 sections:
  1. ***Information in the header:*** When a report is selected, the information which serves as the basis for the report is displayed here.
  2. ***Reports menu:*** Select the report to be displayed here. The latest report is at the top of the list.
  3. ***Status traffic light:*** When a report is selected, the traffic light shows the status of the power quality for that period. Green means that the power quality for the selected period was within the standard; orange that it was outside the desired range, but still within the standard. Red means that the power quality did not comply with standard IEC 61000-2-4.
  4. ***Overview window:*** When a report is selected, all values for this reporting period are displayed in the overview window. More detailed information on this can be found in later chapters.
  5. ***Harmonics overview window:*** When a report is selected, this window displays a graph of harmonic values for that reporting period. More detailed information on this can be found in later chapters.

The "IEC 61000-2-4 Settings" app

- The "IEC 61000-2-4 Settings" app allows you to change the settings for the reports that are to be generated.

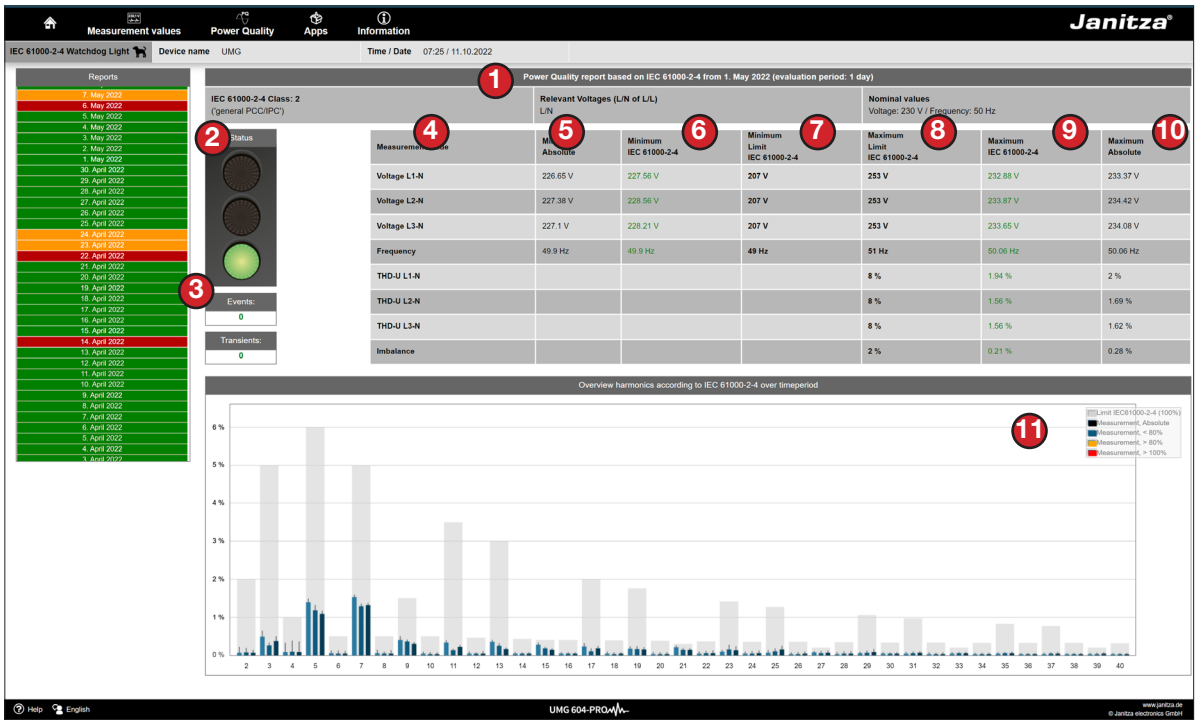


- ***Nominal voltage (V):*** The voltage which serves as the basis for calculating the limit values (default: 230 V (L / N)).
- ***Nominal frequency (Hz):*** The frequency which serves as the basis for calculating the limit values (default: 50 Hz).
- ***IEC 61000-2-4 Class:*** Specifies which IEC 61000-2-4 class is used to assess the measured values (default: Class 2). More information on this can be found in standard IEC 61000-2-4.
- ***Relevant voltage:*** Voltage for the report calculation (default: (L/N)).
- ***Report period:*** Possible settings are one report per day (24 hours) or one report per week (Sunday - Sunday) (default: 1 report per day).
- ***Transient limit:*** Maximum transients allowed - before the status report turns "orange". (Default: 0)

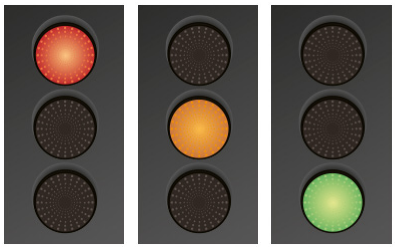
- After you have changed the settings to the appropriate values, save them by clicking the "Save settings" button.

Detailed user guide

Viewing a report



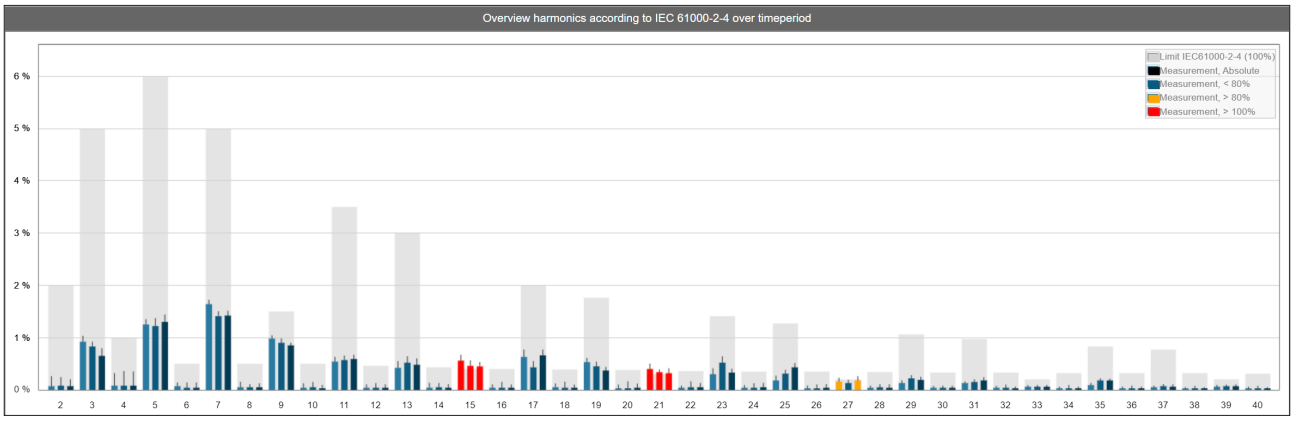
1. ***Information in the header:*** The information on which the report is based. In this case, the report is based on class 2 of standard 61000-2-4 with L/N as the relevant voltages and nominal values of 230 V at a frequency of 50 Hz.
2. ***Status traffic light:*** In this case, the traffic light is green. This means that standard 61000-2-4 has been met. This is also displayed in the report list. The report color corresponds to the traffic light color.

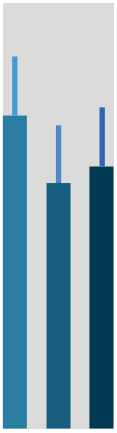


- ***Red:*** At least one value does not comply with standard IEC 61000-2-4.
- ***Orange:*** At least one value is close to the maximum limit value of IEC 61000-2-4 (20%). At least one event has occurred. More transients have occurred than specified in the IEC 61000-2-4 Settings app.
- ***Green:*** All values are well within the limits in standard IEC 61000-2-4.

3. ***Events and transients:*** Events and transients detected by the meter. The result depends on your GridVis configuration.
4. ***Measured value:*** Indicates what has been measured in the report.
5. ***Minimum absolute value:*** The values displayed here show the lowest measured values (200 ms) registered by the meter during the reporting period (in this case, the period of one day). Note: The minimum absolute value does not apply to standard 61000-2-4.
6. ***At least 10 minutes IEC 61000-2-4:*** This is the lowest 10-minute average value registered by the meter during the reporting period according to the minimum value allowed by standard IEC 61000-2-4.
7. ***Minimum limit IEC 61000-2-4:*** This is the minimum limit allowed by standard IEC 61000-2-4. These values are fixed values based on the voltage and frequency settings made in the IEC 61000-2-4 Settings app. These fixed values change when the voltage and frequency settings change.
8. ***Maximum limit IEC 61000-2-4:*** This is the maximum limit allowed by standard IEC 61000-2-4. These values are fixed values based on the voltage and frequency settings made in the IEC 61000-2-4 Settings app. These fixed values change when the voltage and frequency settings change.
9. ***Maximum 10 minutes IEC 61000-2-4:*** This is the highest 10-minute average value registered by the meter during the reporting period according to the maximum value allowed by standard IEC 61000-2-4.
10. ***Maximum absolute value:*** The values displayed here show the highest measured values (200 ms) registered by the meter during the reporting period (in this case, the period of one day). Note: The maximum absolute value does not apply to standard 61000-2-4.

Overview of harmonics according to standard IEC 61000-2-4





Gray bar

Maximum permissible limit according to standard IEC 61000-2-4.

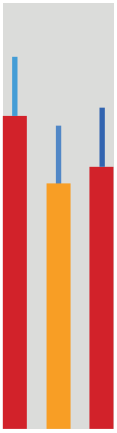
Wide bars

Highest 10-minute average value registered by the meter during the reporting period according to the maximum value allowed by standard IEC 61000-2-4.

The bars indicate in order from left to right the 3 phases L1, L2 and L3.

Blue bars

Values up to 80% of the permissible average value described above.



Orange bar

Values from 80% to 100% of the permissible average value described above.

Red bar

Values above 100% of the permissible average value described above.

Narrow bars

Maximum absolute value: The highest measured values (200 ms) registered by the meter during the reporting period (in this case, the period of one day). Note: The maximum absolute value does not apply to standard 61000-2-4.

Troubleshooting

Below are some issues you might encounter after installing the app.

Problem: No reports are displayed in the report list.

Solution: No report has been calculated yet. Make sure that the device was online during the measurement period and that the app was installed correctly.

Problem: My report shows unusual limit values.

Solution: Make sure that the nominal values have been set to match your mains power supply system.

Problem: My report shows many transients or events.

Solution: Make sure that you have set the transients and events correctly in the device using the GridVis software.

Problem: I cannot access the application.

Solution: Check whether the device is online and the app is installed correctly.

Problem: I have waited longer than one day and have not yet received a report.

Solution: Make sure your settings have been made to generate one report per day.
Your device was offline at 12 noon.
The device time is incorrect.

Janitza®

Janitza electronics GmbH
Vor dem Polstück 6 | 35633 Lahnau
Germany

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

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