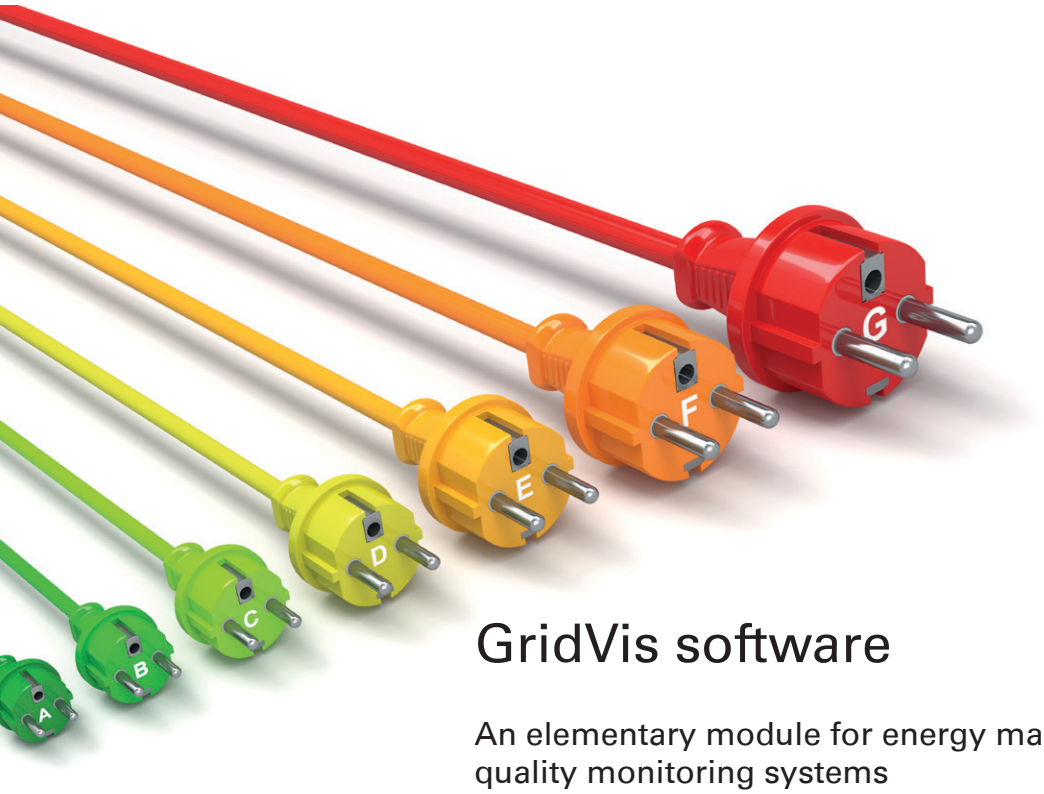
Smart Energy &
Power Quality Solutions

EN 50160 / ISO 50001
Made in Germany

Grid Visualisation Software – GridVis

Energy data management- & power quality monitoring systems

Janitza®



GridVis software

An elementary module for energy management and power quality monitoring systems

In the field of energy management it is very important to be able to evaluate and process data measured for both energy usage and power quality. It should be possible to document all important data measured without interruption, in order to determine reasons for production problems, failures or quality deficiencies.

For example, time stamped data for harmonics, voltage fluctuations or black-outs facilitate the identification of root causes of possible production problems. With timely identification of poor power quality it is possible to take steps to avoid the increased wear or destruction of electrical distribution controls and operating equipment and even reduce the risk of fire. Through the analysis of load profiles and electrical loads it is possible to implement measures to improve energy efficiency. Within the framework of energy management, targets can be defined for energy consumption, CO_2 emissions and energy costs. The new standard ISO 50001 has formulated a suitable framework of conditions for an operational energy management system.

When the energy management system has been chosen, Janitza software and hardware components provide the ability for you to view and document your energy supply.

Energy management systems help companies to optimise the use of energy – from purchasing right through to energy consumption – on a systematic, economical and ecological basis.

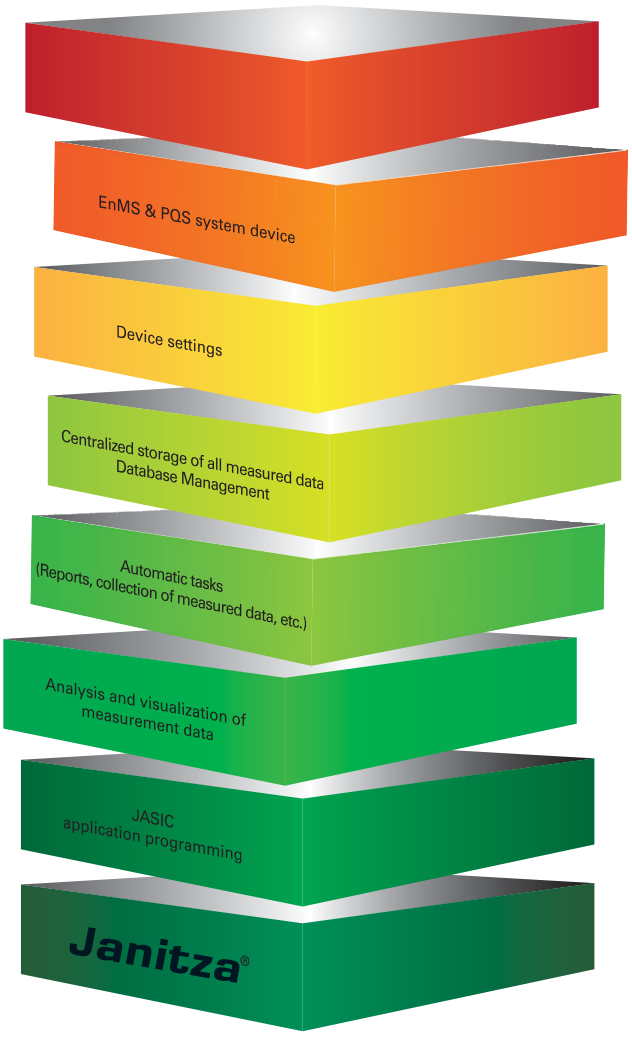
Customer benefits

- ❑ Reduction of energy costs
- ❑ In Germany, Energy tax relief from 2013 in conjunction with an EnMS
- ❑ Ability to view energy consumption in the individual departments
- ❑ Increase in supply reliability
- ❑ Environmental preservation (ecological thinking)
- ❑ Use of an optimised energy mix, optimisation of the energy contracts
- ❑ Greater awareness of employees with regard to energy efficiency and climate protection
- ❑ Cost centre management
- ❑ Cause-based assignment and accounting of energy costs
- ❑ PQDIF-Tool

GridVis software: Versions and applications

With GridVis, Janitza offers user-friendly software for the configuration of an energy monitoring system and for monitoring power quality. The GridVis-Basic software, included with all Janitza measurement devices, allows the programming and configuration of grid analysers, universal measuring devices, data loggers and power factor correction controllers. It also provides the means to read, save, display, process, analyse and evaluate the measured data.

GridVis is a comprehensive and scalable software solution for energy suppliers, industrial applications, facility management, the property market and infrastructure projects.
With GridVis, technical and commercial management can obtain the data that they require in order to identify energy saving potentials, reduce energy costs, take action to avoid production downtimes or to optimise the utilisation of operating equipment.




CERTIFICATE

The certification body of
TÜV SÜD Industrie Service GmbH
Center of Competence
hereby certifies
that the energy data management sytem
GridVis
of
Janitza electronics GmbH
Vor dem Polstück 1
35633 Lahnau
Germany
complies with the requirements of the
TÜV SÜD Standard
"Efficient Energy Data Management"
dated 30.07.2012.

The system has the following characteristics:

- Successful implementation at at least one reference client
- Plausibility check
- Virtual meter points
- Display of load profiles, energy consumption trends, actual and limit values
- Establishing limits and triggering warning messages if limits are exceeded
- Determination of key performance figures
- Management of the supplier's billing data
- Integrated scheduler
- Flexible evaluation cycles
- Generation of energy reports
- Compatibility with at least three standardised bus systems
- Data export to MS Office tools
- **The System meets the requirements of chapter 4.6.1 Monitoring, measurement and analysis of the ISO 50001 standard**

This certificate is based on test report number: 1882513-v01 of 28/09/2012
Certificate registration number: PC0631142/0/50/12
This certificate is valid to: 31/10/2015.

Dresden, 02nd/10/2012

Tobias Fleckenstein
Certification body
Center of Competence

Dr. Michael Bunk
Head of Department Energy Systems
Systems Engineering Division North-East Region

TÜV SÜD Industrie Service GmbH · Certification Body · Center of Competence · Westendstraße 199 · 80686 München · Germany

ZERTIFIKAT ◆ CERTIFICATE ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

ISO 50001 compliant TÜV certified

GridVis licence model / software versions

GridVis is a scalable software environment and is available in the following versions:	
GridVis-Basic	Free basic version Included with the UMG measurement devices
GridVis-Professional	As GridVis-Basic, plus: • Automatic readout of the measurement devices • Virtual devices • MySQL / MS SQL database drivers Primarily developed for professional automated systems
GridVis-Enterprise	Extended functions (principally for evaluation of data) Applicable mainly fo medium to large companies
GridVis-Service	As GridVis-Enterprise, plus: • Service (actively runs in the background for the automatic data readout) • Online logging of measured data • REST data interface (enables ready access to the stored values)

*) For details on the versions refer to the table on page 19

Applications


Industry


Facility management

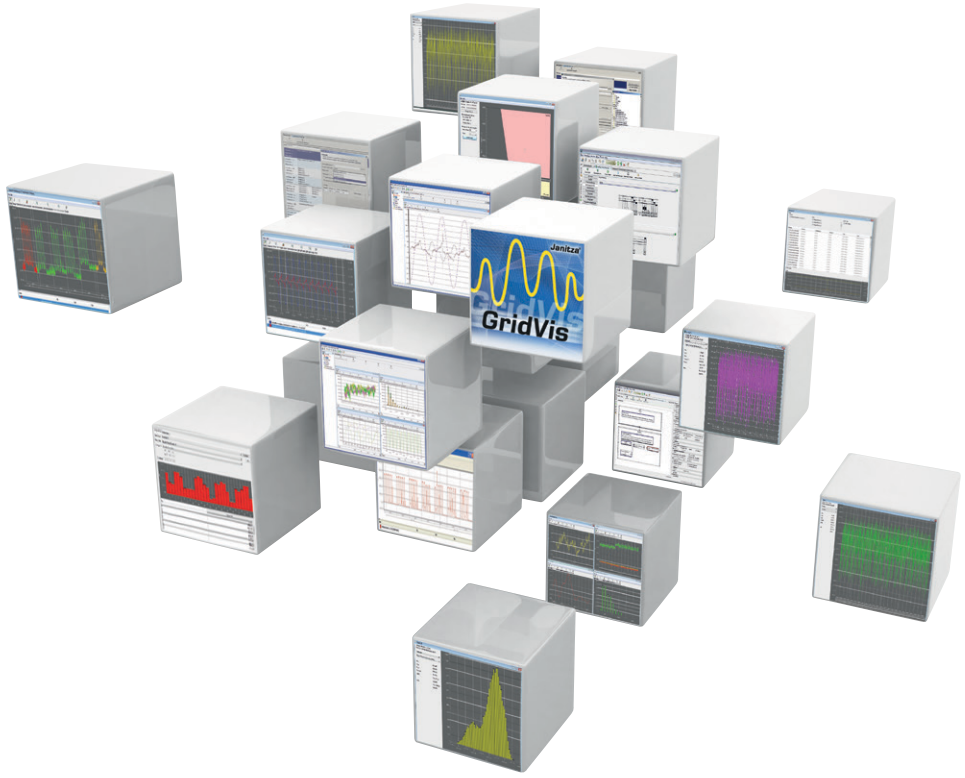

Data centres


Infrastructure


Energy suppliers

Applications in the market segments: Industry, property market, data centres, infrastructure and energy suppliers	
Energy efficiency and energy costs	Analysis of the energy consumption
	Cost allocation
	Optimisation of the energy consumption
	Load management
	Energy demand figures
	Reactive current compensation
	Automation and control of the energy distribution
Power quality and supply assurance	Optimisation of the energy distribution
	Power quality analysis and maintenance
	Monitoring and trouble-shooting power quality events
	Alarms and event overview
	Increase in system reliability

GridVis software: Main features



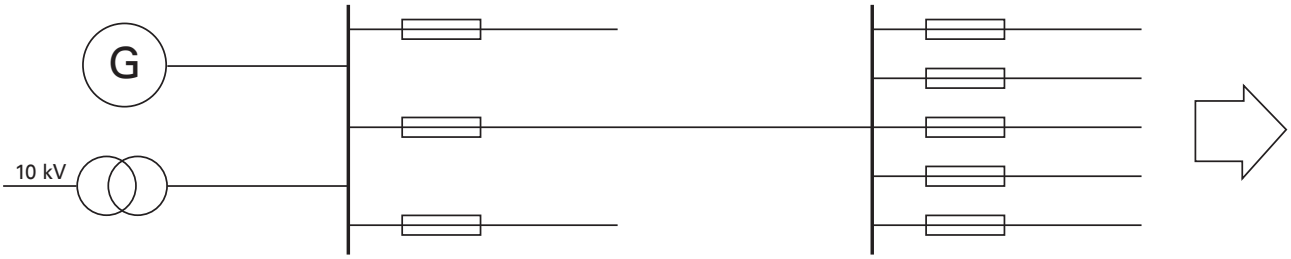
- ❑ Intuitive operation
- ❑ Configuration of the measurement system and the UMG measurement devices
- ❑ Measurement device management
- ❑ Automatic or manual measured data readouts from the devices
- ❑ Graphic presentation of online measurement values and historical data
- ❑ Two different measurement variables can be presented on a single graph (also from any number of measurement devices)
- ❑ Presentation of minimum, mean and maximum values on a single graph
- ❑ Statistical evaluations
- ❑ Comprehensive export functions e.g. in a CSV file (Excel)
- ❑ PQDIF-Tool (Power Quality Data Interchange Format)
- ❑ APPs management (customer-specific applications / programs)
- ❑ Storage of data in a database incl. database management (e.g. MySQL / MS SQL / Derby / Janitza DB)
- ❑ Topology views (configurable, graphic user interfaces with freely selectable register levels)
- ❑ Individually adjustable schedules (e.g. report generator)
- ❑ Use of virtual devices e.g. for totalling values from multiple devices or creating key-figures
- ❑ Generic modbus device for the integration of “non-Janitza devices“
- ❑ Report generators enable the setting and configuration of reports (energy costs and power quality)
- ❑ Multilingual

System architecture

When configuring monitoring systems it is advisable to apply the "pyramid approach" across three measurement levels.

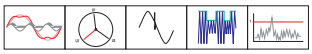
Measurement level one refers to a few high end quality, class A measurement devices on the supply.

Master measurement devices are positioned in the subsequent stage at the main node points with event logging, Ethernet and Gateway functionality.
The third and final level shows basic meters or field bus devices in the distribution boxes, outlets or directly attached to the machine.



PCC / Power feeds and at site generation

- Meter for PQ analysis EN 50160
- Class A measurements IEC 61000-4-30
- Short interruptions and transient analysis
- Flicker and harmonic analysis up to 63rd
- Accuracy 0,1 U/I and 0,2 S for kWh



UMG 511 UMG 605

Switching equipment and main distribution cabinets (e.g. refrigeration,...)

- Short interruptions and transient analysis
- Harmonic analysis up to 40th
- Accuracy 0,2 U/I and 0,2 / 0,5 S for kWh
- Modbus /TCP / IP gateway function integrated

UMG 508 UMG 604

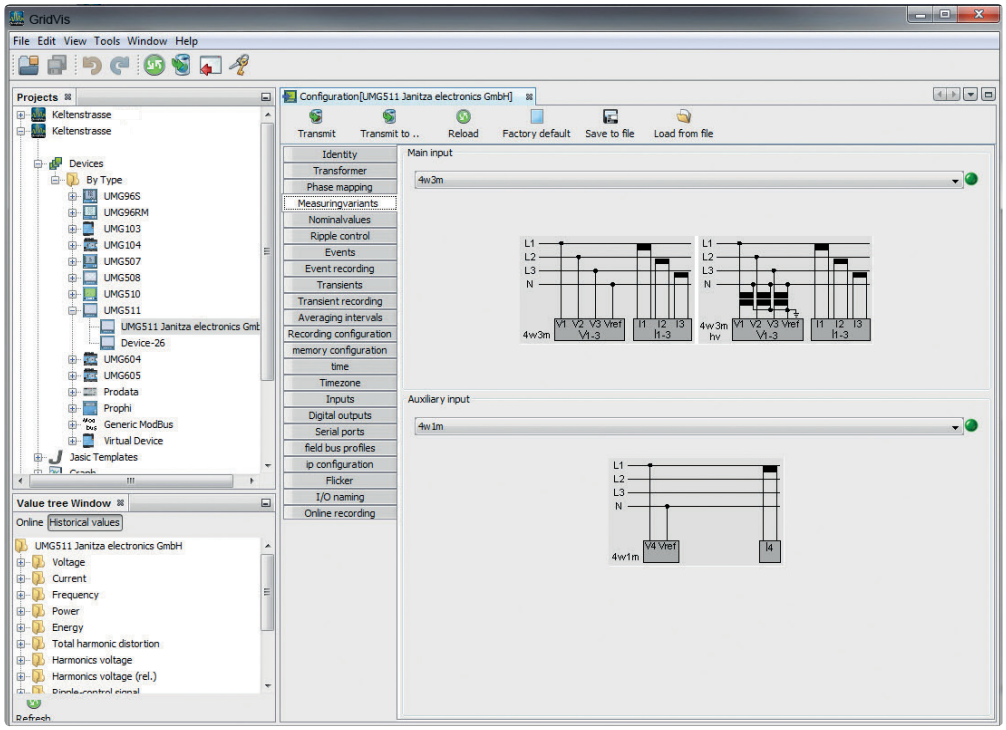
Monitoring subfeeders, PFC, machinery level, lighting, tenants, and others

- Energy consumption, currents, voltages, load profiles, harmonics, ...
- High measurement accuracy
- Simple system integration

UMG 103 UMG 104 UMG 96RM

Device configuration

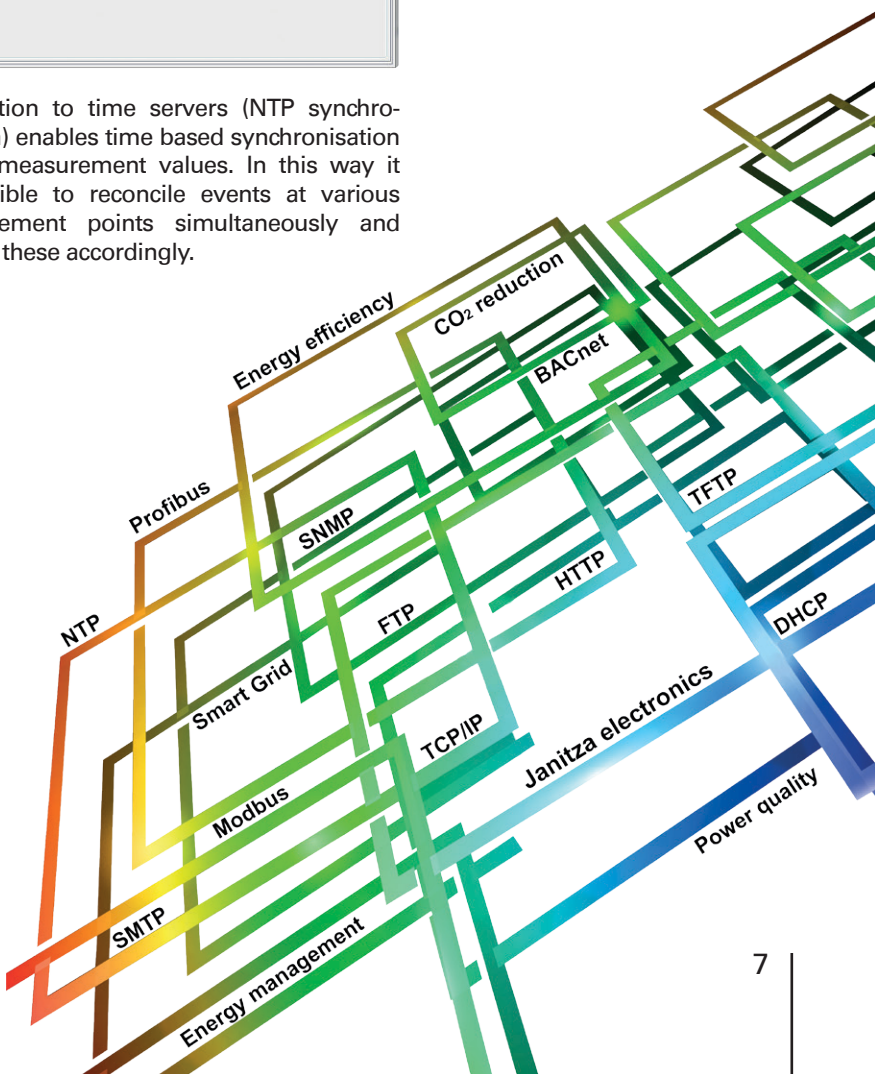
Setting parameters and configuration of measurement devices



The user-friendly GridVis software allows integration, and configuration of UMG measurement devices, their parameters can be set and comprehensive settings for custom solutions created.

Trigger values for the measurement of events and transients can be defined as well as the measurement values for storage together with storage intervals. It is possible to program the limit values for the monitoring function of the digital outputs, via comparators or determine pulse values for the digital inputs or outputs.
It is also possible to capture the readings of external temperature sensors for the transformer or ambient temperature.

Connection to time servers (NTP synchronisation) enables time based synchronisation of the measurement values. In this way it is possible to reconcile events at various measurement points simultaneously and identify these accordingly.



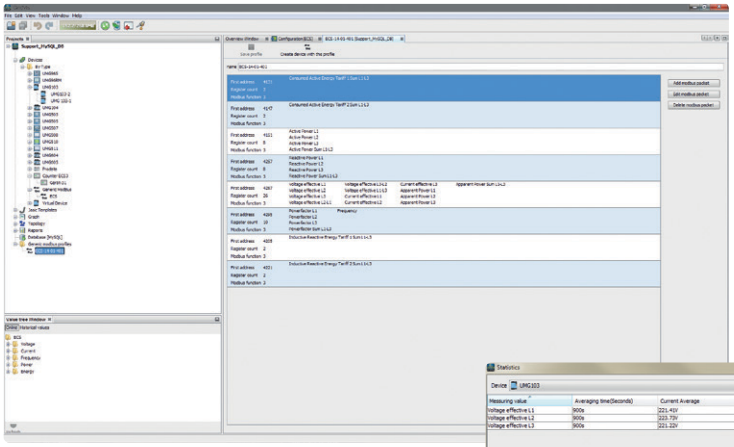
Generic modbus devices (Modbus RTU, Modbus TCP/IP)

GridVis offers a range of options for the integration of 3rd party devices. The "generic modbus" function provides a simple integration option for "non-Janitza measurement devices" via Modbus RTU or Modbus TCP/IP. The external devices must support the modbus RTU protocol. The data formats must also comply with the modbus recommendation or with the available formats in GridVis. The Modbus ASCII protocol is not supported by GridVis.

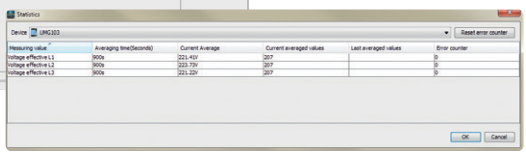
The connection of external devices is achieved with a Modbus master UMG, via its RS485 connection or the value can be read out directly with GridVis via Modbus TCP/IP, using Ethernet.

The external devices are integrated through profiles and managed in GridVis as templates, which can subsequently be used multiple times per project. It is also possible to export a template. Profiles are created and edited directly in GridVis.

The measured values read out from the external devices can be used in the topology view and in the GridVis virtual devices. When using the GridVis-Service version it is also possible to store the measured values online with mean value formulation. The measured values are cyclically polled here. It is possible to control the communication via an integrated statistics function.



Example of an ECS template for Modbus meter



Communication control via integrated statistics function

Overview of functions

- ❑ Data transfer speed 9.6, 19.2, 38.4, 57.6 ... 115.2 kbps
- ❑ Device integration via RS232, RS485, modbus (Ethernet)
- ❑ Supporting function codes: Read coil status (fc = 1), Read holding registers (fc = 3), Read input status (fc = 2), Read input registers (fc = 4) as well as the formats Floating Decimal Point (32 bit, 64 bit) each per IEEE 754 as Short (16 bit), Unsigned Short (16 bit), Integer (32 bit), Unsigned Integer (32 bit) and Integer (64 bit)
- ❑ Profiles are freely configurable
- ❑ Online storage of the values possible
- ❑ Values: Water, gas, heat, energy, etc.
- ❑ Export and import of the values possible
- ❑ Values are read in blocks

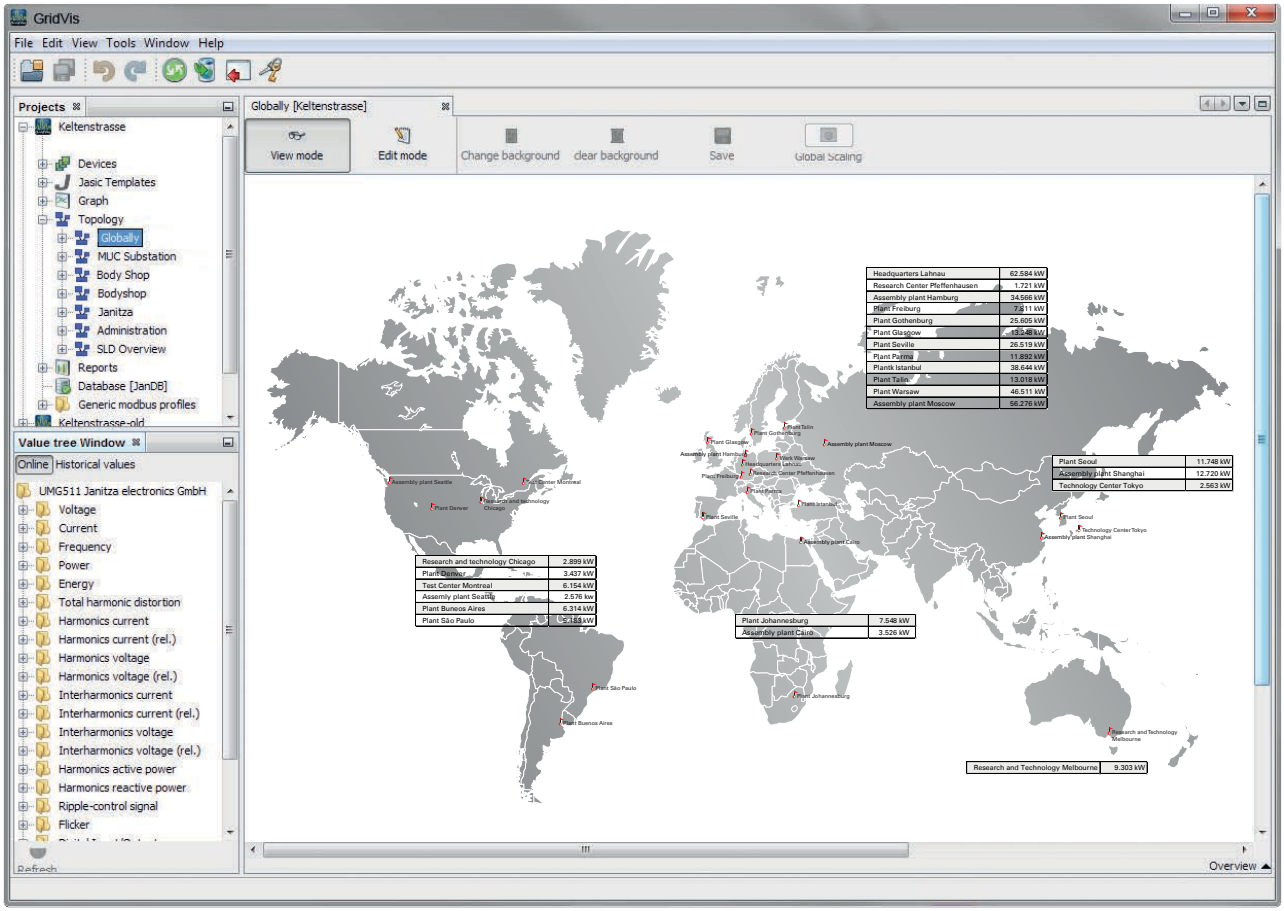
Topology views (visualisation)

The topology view provides a quick overview of the energy distribution system with the option of localising grid failures through a comparison of the individual measurement points and checking the defined tolerances at a glance.

It is quick and easy to create customer-specific solutions by storing graphic files (standard format JPG) with circuit diagrams, production lines or construction plans and integrating the associated measurement devices by means of “dragging and dropping” to their actual location.

Presentation of limit value overruns (e.g. THD-U too high) as well as input and output status is also possible. If parameters are above or below threshold limit values these can be highlighted by means of a change in colour.

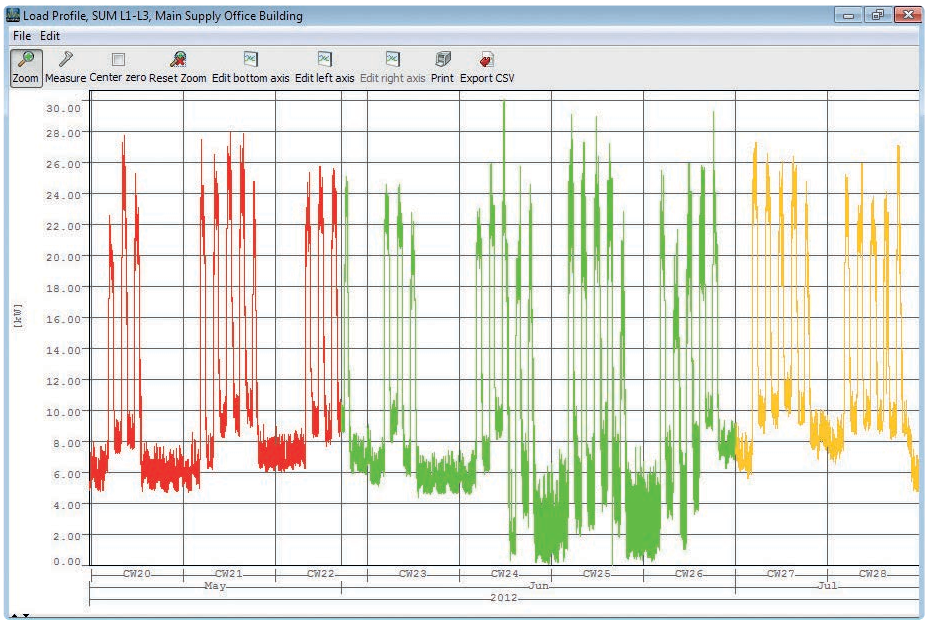
It is possible to call up a device view of every measurement device on the system which is online. This view is available directly via the actual display. Furthermore, in the case of some device types remote operation is also possible. All selected measured data for the devices can be presented online simultaneously.



Online and historical measured values

Online data
Online data comprises all measured values that are captured by the measurement devices on a current basis during runtime and constitute the momentary ACTUAL status.
GridVis enables specific logging, reading and display of online data. The data obtained from various measurement points is collected, stored, prepared, displayed and made available. All measured values are available in the online measurement mode, either as line graphs or bar charts.

The line graphs are always up-to-date with the oldest data being omitted dependent on the measured data quantity setting. It is possible to set two y scales for the measured data of two units, e.g. current and voltage, on a time-synchronous basis. An arbitrary quantity of measured data from multiple measurement devices can be presented on the same graph for each unit. The colours of the graphs can be selected and amended on an individual basis.



Presentation of load profile effective power L1-3 (kW)

Historical data
The measured values which are stored – either in the device or read out from the device and saved to a database – and made available in accordance with defined rules and averaging periods are referred to as historical data. Each stored value is given a unique time stamp and the respective device IDs are assigned. The data is stored in the database by parameter, year, month and day. The data can therefore be extracted on a selective basis.

Particularly interesting time frames can be enlarged with the zoom option and measured using the measurement function.

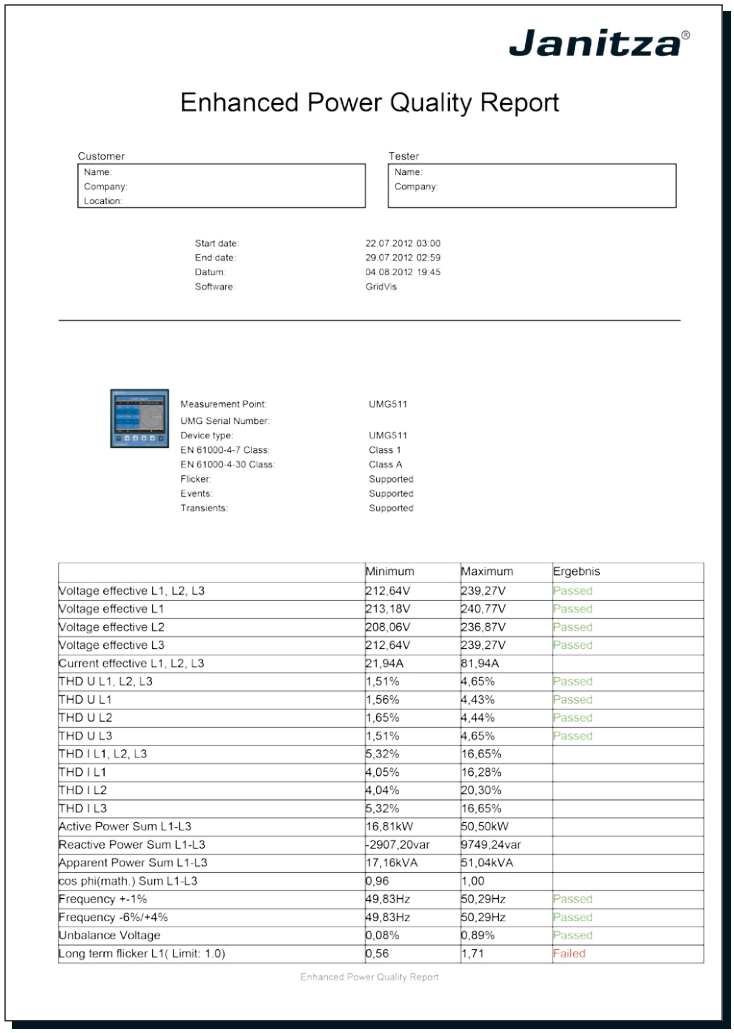
Presentation of the data in the form of bar charts, line graphs or histograms can be appended and printed out with headings and comments. The presentation of transients and events also takes place here in the transients or events browser. The flag browser offers the option to show missing measured data over certain periods, as well as untrustworthy measurement information. For eaxample by analysing historical data it is possible to show load profiles, in order to produce precise requirement analyses for optimised current supply contracts. It is also possible to carry out fault analyses by comparing various parameters with just a few mouse clicks.

Reporting – Power Quality

(EN 50160, EN 61000-2-4, Nequal, IEEE 519, ITIC CBEMA, PQDIF, etc.)

The voltage in our electrical systems today is far from a pure sinusoidal shape. A wide range of "power quality distortion" types such as voltage interruptions, transients, harmonics, flicker and inrush currents alter the sinusoidal character of the currents and therefore also the voltage.

In some instances this results in damage to operating equipment, which is exposed to excessive electrical loads and may exhibit increased thermal losses. A loss of operating equipment or its restricted functionality may cause an associated production failure. A high flicker level can lead to fatigue and discomfort of personnel, whose capabilities are affected. Unacceptably high currents in the protective earth conductor cause voltages in radiators, pipes, etc. Increased currents in underdimensioned neutral lines pose a significant fire hazard. It is therefore advantageous to detect power quality events in a timely manner, and to take corrective action. GridVis offers all of the tools required for this. At the heart of the system analysis is the reporting system of the GridVis software. This offers confirmation – at a glance – as to whether the power quality is adequate or not during the period under review. However, further tools are also available for analysis of the supply to help identify root causes of problems.



Janitza®

Enhanced Power Quality Report

Customer
Name:
Company:
Location:

Tester
Name:
Company:

Start date: 22.07.2012 03:00
End date: 29.07.2012 02:59
Datum: 04.08.2012 19:45
Software: GridVis

Measurement Point: UMG511
UMG Serial Number:
Device type: UMG511
EN 61000-4-7 Class: Class 1
EN 61000-4-30 Class: Class A
Flicker: Supported
Events: Supported
Transients: Supported

	Minimum	Maximum	Ergebnis
Voltage effective L1, L2, L3	212,64V	239,27V	Passed
Voltage effective L1	213,18V	240,77V	Passed
Voltage effective L2	208,06V	236,87V	Passed
Voltage effective L3	212,64V	239,27V	Passed
Current effective L1, L2, L3	21,94A	81,94A	
THD U L1, L2, L3	1,51%	4,65%	Passed
THD U L1	1,56%	4,43%	Passed
THD U L2	1,65%	4,44%	Passed
THD U L3	1,51%	4,65%	Passed
THD I L1, L2, L3	5,32%	16,65%	
THD I L1	4,05%	16,28%	
THD I L2	4,04%	20,30%	
THD I L3	5,32%	16,65%	
Active Power Sum L1-L3	16,81kW	50,50kW	
Reactive Power Sum L1-L3	-2907,20var	9749,24var	
Apparent Power Sum L1-L3	17,16kVA	51,04kVA	
cos phi(math.) Sum L1-L3	0,96	1,00	
Frequency +-1%	49,83Hz	50,29Hz	Passed
Frequency -6%/+4%	49,83Hz	50,29Hz	Passed
Unbalance Voltage	0,08%	0,89%	Passed
Long term flicker L1(Limit: 1.0)	0,56	1,71	Failed

Enhanced Power Quality Report

Overview of functions

- ❑ Power quality reports according to the following international standards
  - ❑ EN 50160
  - ❑ EN 61000-2-4
  - ❑ NeQual
  - ❑ IEEE 519
  - ❑ ITIC (CBEMA)
    (only online not automatic)
- ❑ Per schedule: Reports are produced according to time
- ❑ Manual reporting in case of specific requirements
- ❑ PQDIF

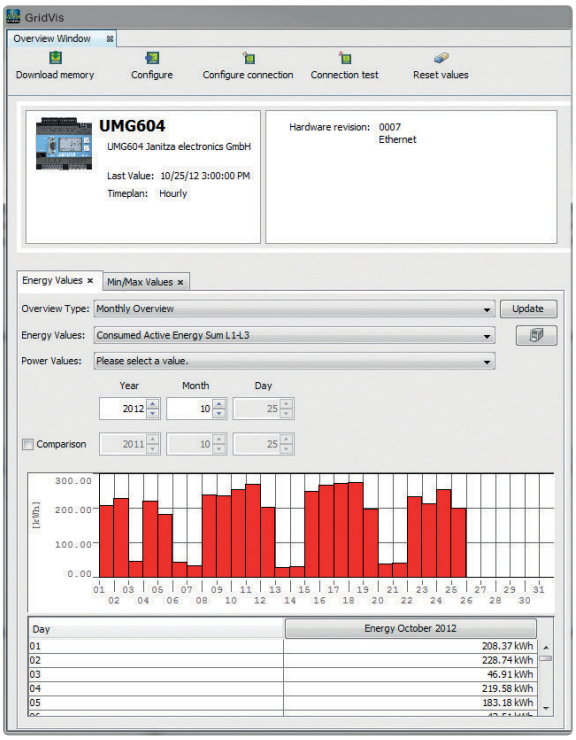
Reporting – Energy management systems

Within the framework of an energy analysis it is necessary to measure and monitor important parameters of the electrical energy supply. The data supplied from the measurement devices is displayed in GridVis online as momentary values or from the historical values.

The evaluation of this data can take place via the report generator integrated into GridVis.

The reports can consolidate a range of information depending on the requirements and settings. For example energy and power-related cost centre reports can be created. This not only facilitates the presentation of electrical energy values from the measurement devices but also the allows evaluation of other media (gas, water, etc). Furthermore, load profile analyses, which are based on a defined time frame, provide an overview of peak demand consumption.

The generation of individual reports can either be automatic via freely definable schedules or can be started manually by the user as a printable report or as an HTML, XML, Excel, Word or PDF file.



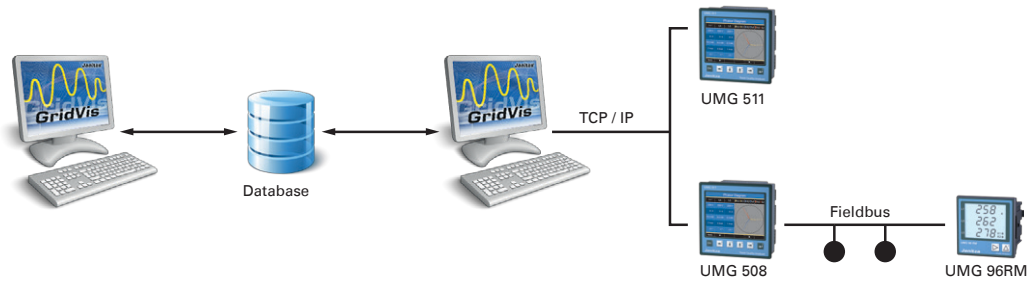
Consumption profile – monthly view

Overview of functions

- ❑ Energy consumption / power requirement / cost centre reports
- ❑ Load profile analyses
- ❑ Automatic report generation
- ❑ Freely definable schedules

Database management

Database connection in GridVis Desktop and Service



GridVis Desktop

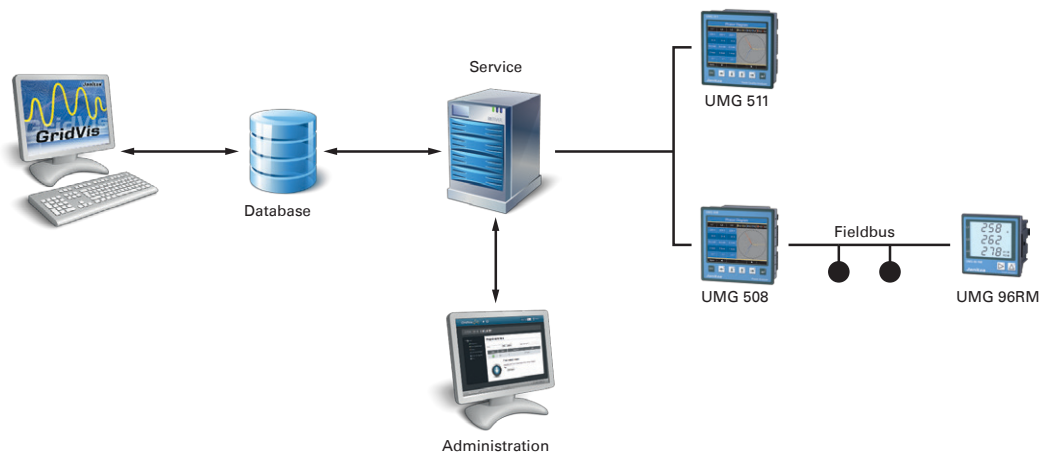
Almost every measurement device is equipped with an integrated data storage facility. When this memory is read out, the measured data is backed up to a database. Apache Derby, MySQL and MS SQL databases can be selected. In the case of projects with 5 devices or more we recommend the use of an SQL database.

The possible installation software versions are GridVis Desktop, GridVis Service and a mix of GridVis Desktop / GridVis Service.

GridVis Desktop can be installed locally on a desktop or centrally on a virtual machine. When reading out data from the measurement devices GridVis must run as an open, active program. From here it is possible to address, read from or configure devices. All generated data is written to the database associated with the respective GridVis project.

GridVis Service functions in the same way via a system service on a remote server. As servers are rarely switched off, this system service can read out data from the measurement devices on a constant basis in the background, without GridVis being open on a client computer. This type of service installation can be used by multiple clients in parallel. The configuration of devices and projects takes place via the GridVis Desktop program interface. The rights for the devices are subsequently handed over to the GridVis Service. This can be configured via a browser. All graphic and statistical evaluations continue to take place via the GridVis Desktop.

In general it is possible for any number of GridVis Desktop and Service instances to access one and the same database (with the exception of Apache Derby). However, a device, at any one time can be linked only to one GridVis or one GridVis Service.



GridVis Service

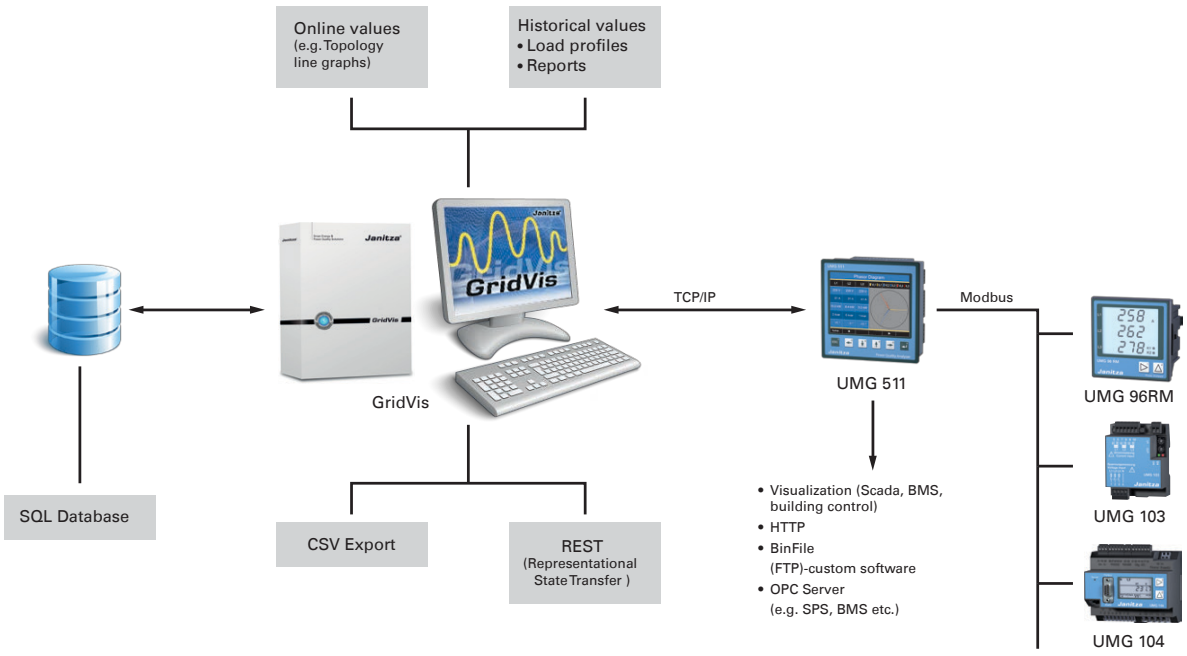
Easy data exchange

Due to numerous interfaces and proto-cols (e.g. Modbus / Profibus / M-Bus), an un-complicated system connection (energy management system, PLC, SCADA, GLT) is ensured.

In general terms all energy measurement devices can now be networked with each other. Communication between GridVis and the measurement devices takes place via Modbus RTU or Modbus TCP. Mea-sured data is read out automatically via a field bus and made available for further use via a central data server.

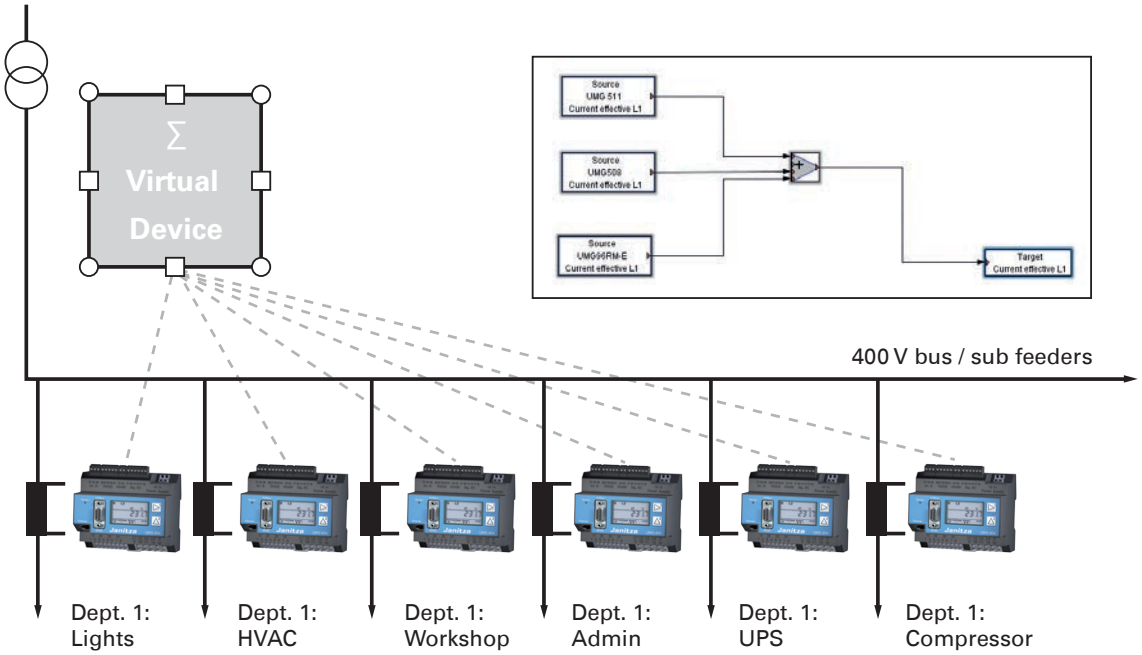
To keep installation costs low (e.g. pe-ripherals for field buses), Ethernet TCP/IP is used increasingly frequently as the backbone of the data communication. Through connection to an existing Ether-net architecture, fast, cost-optimised and reliable communication is usually guar-anteed.
Janitza systems essentially offer an extremely open architecture so the Mod-bus addresses can be accessed directly using PLC, BMS or SCADA software, or alternatively the UMGs can be integrated in a PLC environment via Profibus.

The BACnet protocol plays a significant role in the field of building automation. "BACnet" is a manufacturer-independent data transfer protocol for "open com-munication" in building automation sys-tems for regulation and control of equipment used within this field.
"BACnet" facilitates communication be-tween equipment in various systems from a range of manufacturers.



Overview of the diverse connection options with software environments

Virtual measurement devices (cost centres, key figures)



The virtual measurement device calculates the total consumption in the supply line

"Virtual measurement devices" are available with GridVis for the purpose of mathematical calculations.
Through the addition of various measurement points it is possible to consolidate entire areas. This function is a useful application in particular for cost centre management.

A further application area is the calculation of key figures. For example, in order to evaluate the energy efficiency in computer centres the calculation of power usage effectiveness (PUE) would be useful. In such calculations the total energy consumed in the computer centre is presented in comparison to the energy consumption of the computers.

Virtual measurement devices can calculate the momentary as well as the historical value where the pertinent basic data exists. The following operations are possible: Addition, division, multiplication and subtraction.

With the aid of numerical constants it is also possible to calculate percentage values. A major advantage of the GridVis virtual measurement devices is that no additional measured values are stored in the database. Virtual measurement devices carry out calculations during the GridVis runtime. For the purpose of the graphic display it gains direct access to the source data of the device, calculates the value and displays this in the graphic. Up-to-date measured values from virtual measurement devices are also calculated during the GridVis runtime.

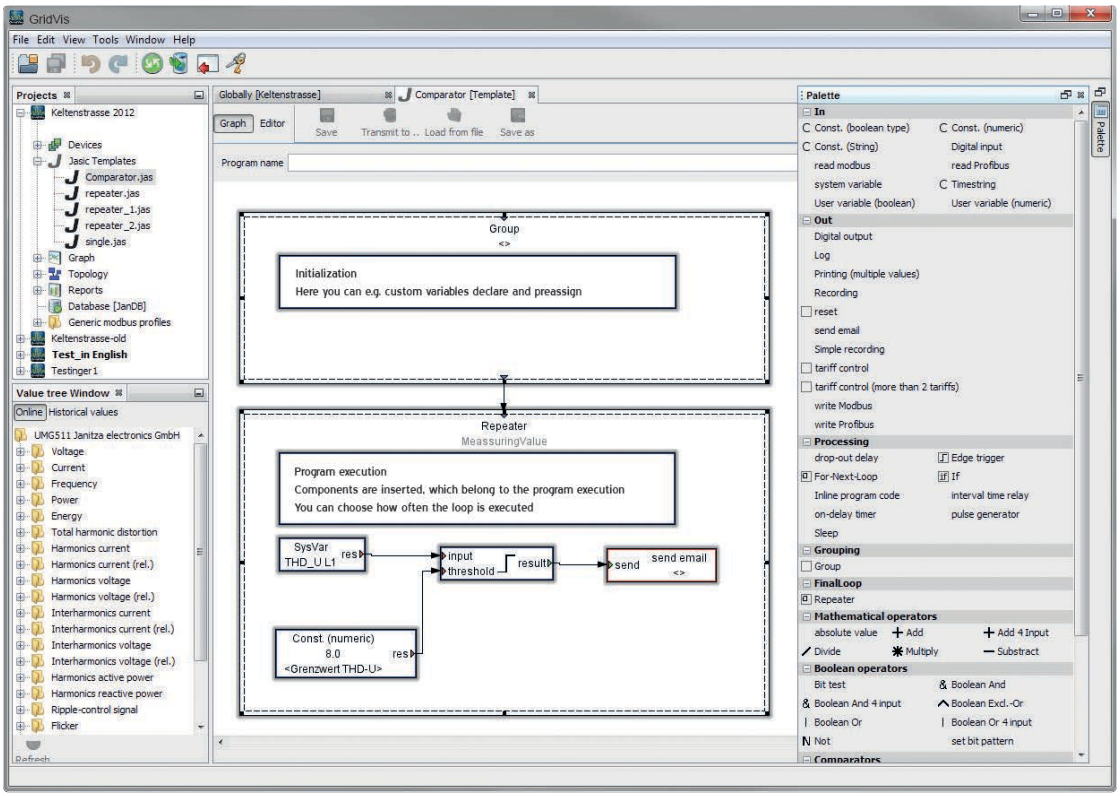
A range of target data points are available for calculations with non-electrical media. A data logger such as ProData can serve here as a source of these media. The integration of external devices via the generic modbus option of GridVis is also possible (it may be necessary to carry out an integration test in this case). It is optionally possible to process the measured values of global variables from the measurement devices in the virtual devices.

Jasic and graphic programming

Unlimited programming options

The programming language Jasic® opens up a range of new options. One is no longer bound to the functions specifically integrated in the device alone, but can expand the device to include additional individual functions. The graphic programming allows the generation and configuration of logical links or mathematical functions. It is also possible to describe one's own digital outputs and evaluate digital inputs. Furthermore, the registers of external devices can be analysed and defined via Modbus (licence required).

Messages can be sent via email if limit values are exceeded. Time switching functions or the logging of special values can be freely configured by means of the graphic programming. The programs, once created, are stored directly in the respective UMG measurement device and run here autonomously.
The possibility of the graphic programming of application programs constitutes a true novelty in the field of power analysers. In addition to the user-friendly graphic programming, the user is also able to program the code directly, via Jasic source code.



The functional overview offers a wide range of functions, in order to implement graphic program with ease

Analysis of power quality

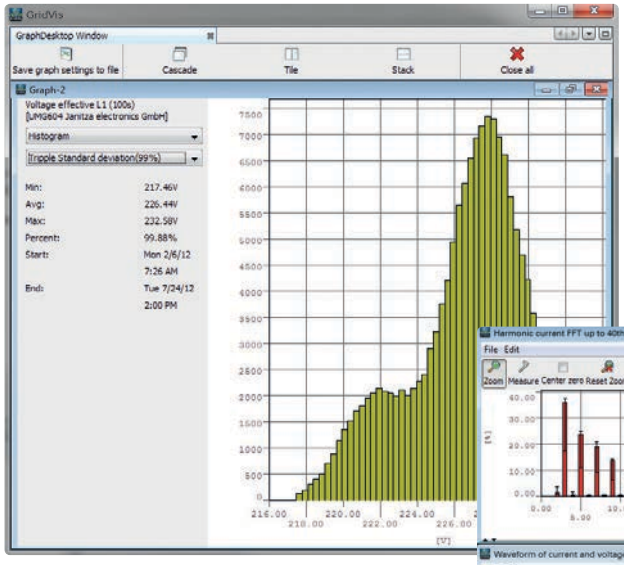
In parallel with energy monitoring GridVis also places a principle focus on monitoring the power quality.

The threshold values are issued to the measurement device via GridVis. System events such as overvoltage, undervoltage, short-term interruptions, overcurrent and transients are accordingly automatically logged with preset cycles before and after the event. Preconfigured parameter lists are available for logging in accordance with EN 50160 and EN 61000-2-4. The power quality is negatively affected by the increasing number of non-linear loads. On the other hand "mains feedback", caused by the trend towards decentralised energy generation and the reduced mains short circuit power frequently associated with it, has a greater effect – mains feedback!

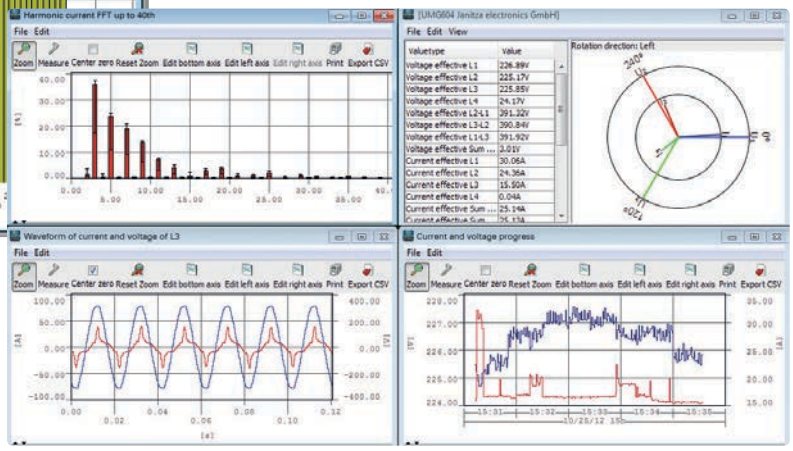
Continuity of supply, system assurance, supply reliability, service and in particular power quality are of primary importance to the customer.

GridVis delivers a range of features for the analysis of power quality:

- ❑ Oscilloscope function of the live values of numerous power quality parameters
- ❑ Topology view, with limit value monitoring of online values
- ❑ Transients and event overview in the measurement device dashboard
- ❑ Graph sets with freely selectable measurement parameters
- ❑ Automatic generation of PQ reports according to schedule
- ❑ PQ reports for diverse standards: NeQual, EN 50160, EN 61000-2-4, IEEE 519
- ❑ Comprehensive statistics functions
- ❑ ITIC (CBEMA) curve
- ❑ Event browser via lists and graphic presentation for detailed analysis
- ❑ Transients browser via lists and graphic presentation for detailed analysis
- ❑ PQDIF



Statistics function with histogram, e.g. with threefold deviation (99 %) for the evaluation of the voltage fluctuation at a specific measurement point over time



Graph set with freely selectable PQ values

Events and transients

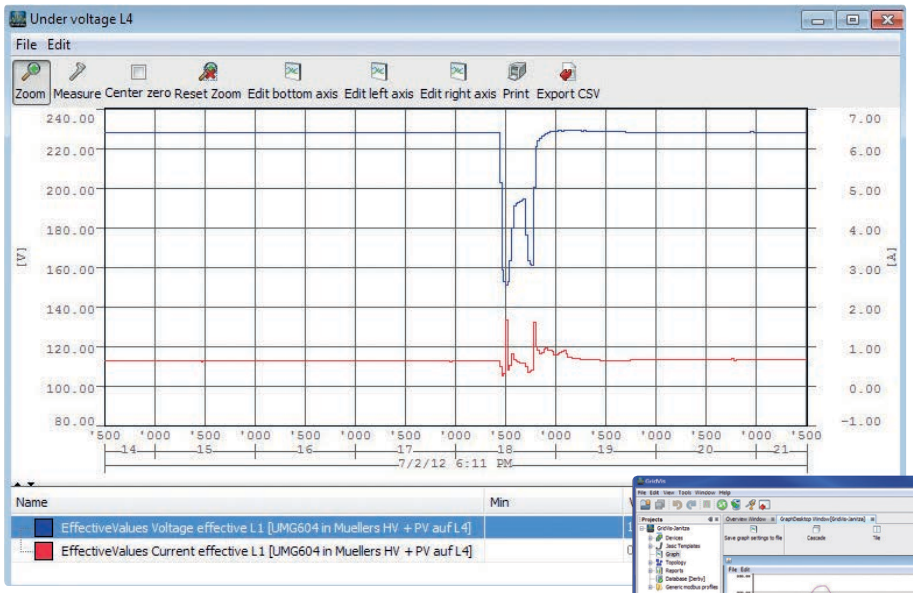
The costs of voltage dips (sags) and transients are commonly underestimated!

Events refer to short-term voltage peaks, dips or short-term interruptions, e.g. due to bird strike or a short circuit caused by construction works.

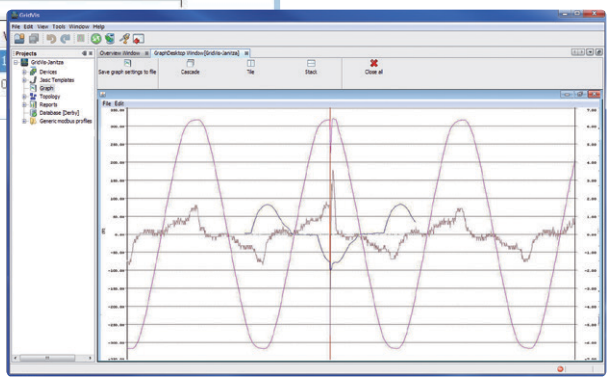
Voltage dips and short-term interruptions can cause major problems. Especially in production and in critical processes, this can result in quality problems and production downtimes. The financial effects of such voltage drips are commonly underestimated.
Short-term interruptions usually incur immediate, often with considerable costs.

It is therefore important to identify and analyse the cause of such power quality fluctuations with user-friendly tools.

With the event and transients browser, GridVis offers helpful tools through which to ascertain and classify diverse events on the supply system In both procedures the list view reports on the event data. From the list it is possible to call up the respective graph, zoom in or out, print it or export it to a PDF or CSV file. GridVis optimally utilizes the device capacity. As such, events from a duration of 10 ms and transients from 50 µs can be reliably logged and further processed.



The event browser provides a rapid overview of the voltage drops with date and time stamp, length and depth of the voltage drop



Detailed analysis of a critical voltage drop

Software versions

Description	Basic	Professional	Enterprise	Service
Installations (Desktop)	1	3	5	5
Installations (Service / WEB)	0	0	0	2
Number of devices	5	Unlimited	Unlimited	Unlimited
Update time frame	Unlimited	1 year	1 year	1 year
Telephone support	Unlimited	Unlimited	Unlimited	Unlimited
Graphs	•	•	•	•*1
Database JanDB / Derby	•	•	•	•*1
Manual reports	•	•	•	•
Graphic programming	•	•	•	•*1
Topology	•	•	•	•*1
Database support MySQL / MS SQL	-	•	•	•
Automatic reading	-	•	•	•
Virtual measurement device	-	•	•	•
Automatic CSV export	-	-	•*2	•*2
Generic modbus	-	-	•	•
Graphic programming module (write / read modbus)	-	-	•	•*1
Cost centres	-	-	•	•
Automatic reports	-	-	•	•*1
Online recording	-	-	-	•
Service	-	-	-	•
Article number	**51.00.116**	**51.00.160**	**51.00.170**	**51.00.180**
Article number / update extension per year	-	**51.00.161**	**51.00.171**	**51.00.181**
Article number / upgrade to next higher suite	-	-	**51.00.162**	**51.00.172**

*1 This function is only available in conjunction with the GridVis installation on the desktop.
*2 For an automatic CSV export it is necessary to utilise the Service Item no. 51.01.015 "Generation of Groovy scripts".

Number of devices: Max. number of simultaneously loaded devices (e.g. in the Basic version: One project with 5 devices or 5 projects with one device).
Update time frame: Time frame within which the new version can be installed free of charge.
Automatic reading: Device reading according to freely configurable schedules.
Virtual measurement device: Generation of cost centres, key-figures, ...
Generic modbus: Integration of "non-Janitza devices".
Inputting online: Measured data from devices without memory is determined in the GridVis software.
Automatic CSV export: Automatic reading facilitates an automatic CSV export.
Service: The GridVis software runs in the background and starts automatically without a user login to the computer as well as saving the device data. GridVis-Enterprise is included in the package and is required for configuration and data processing.


CERTIFICATE
GridVis
ISO 50001 compliant TÜV certified

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Power Quality Solutions

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