



MAVOWATT | **20**
Energy | Platform

Mavowatt 20 – Energy and Power Analysis at its Finest

The MAVOWATT 20 three-phase energy and power analyzer is an innovative and indispensable tool for all measuring tasks in the rapidly growing energy sector.

Whenever energy costs need to be audited, energy efficiency should be increased, energy saving systems will be installed, alternative energy approaches will be examined or CO₂ footprint has to be ascertained – the MAVOWATT 20 is always first choice.

Where energy management systems will be introduced within the company in accordance with EN 16001 as well, the analyzer delivers important information for the installation of stationary acquisition and evaluation systems such as Gossen Metrawatt's SMARTCONTROL.



Features

- **Simple setup and quick measurement results**
automatic setup reliably guides the user to the desired goal.
- **Large recording capacity and fast data transfer**
thanks to interchangeable CF memory cards with up to 32 GB
- **Precision measurement and uninterrupted recording**
0.1% accuracy for voltage and current, 256 samples per period
- **Detection of mains disturbances**
acquisition of harmonics, as well as voltage dips and swells
- **Determination of environmental influence**
ascertainment of CO₂ emissions relative to energy consumption
- **Clear-cut reports for demand and energy**
compilation of measured values and display of exceeded limit values
- **Comprehensive energy analyses**
separate acquisition of energy import and export, as well as evaluation according to tariff zones
- **Additional, differentiated measurement input**
measurement of N-PE voltage and neutral conductor current is possible
- **DC coupled measurement inputs**
alternating and direct voltage can be measured
- **Creation of customer-specific reports with EPRW software**
license-free Energy Platform Report Writer software included
- **Compatible with DranView 6 software**
DranView 6 can be updated with driver and energy audit report

Diverse Applications

For first time users and longstanding professionals as well, the MAVOWATT 20 universal mains analyzer is the ultimate measuring instrument for all users.

A diverse range of applications covers initial start-up, monitoring and maintenance of electrical networks and systems, right on up to regenerative power generation systems.

For example, simultaneous measurement of power at the input and the output of photovoltaic inverters is thus made possible, in order to ascertain efficiency.

■ Extremely well laid out for application in the field of alternative energy

- Initial start-up of wind power turbines
- Monitoring of individual generators or overall power generation
- Photovoltaic applications, determination of inverter efficiency
DC and AC measurements
- Monitoring of energy flow direction – generation or consumption

■ Initial start-up, monitoring and maintenance of power supply systems

- **Layout and monitoring of reactive power compensation systems**
- **Monitoring of harmonics and layout of compensation filters**
- **Measurement and monitoring of all electrical quantities in networks, supply lines, distributors and systems**
- **Acquisition of energy consumption and costs, determination of current daily, weekly and monthly load characteristics**



The Easy-Care Power Pack

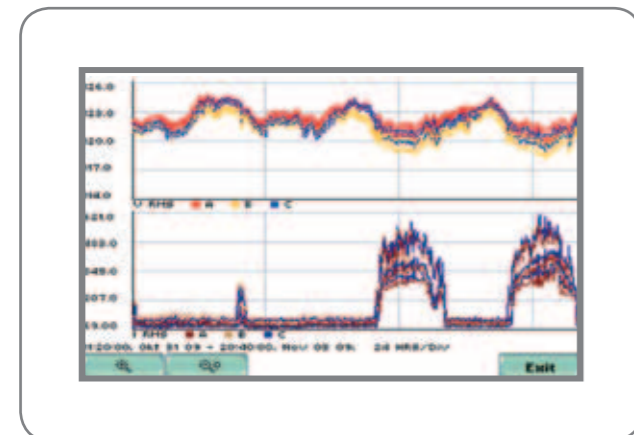
Unpack and Fire Away – Automatic Setup

Correct execution of measuring tasks is decisive for all applications. As a prerequisite, the measuring instrument has to be set up correctly because decisions about further required action for energy benchmarking/reductions or for alternative energies are based upon measurement results which depend upon the setup.



Automatic setup transforms the MAVOWATT 20 into an immediately usable tool. After connection to the load, the electrical circuit is switched on and automatic setup is started. The MAVOWATT 20 does everything else by itself. It detects mains type, nominal voltage and current in a single step, displays the values for review and, after acknowledgment with the OK button, starts measurement and recording.

The MAVOWATT 20 also offers an interactive setup wizard for those who would like to select their own limit values, recording intervals and other settings for ideal matching to the respective application. The user can create individual device configurations for various measuring tasks, and store them to compact flash memory. During use of the MAVOWATT 20, the respective configuration is loaded and quick adaptation to the required measuring task is assured.



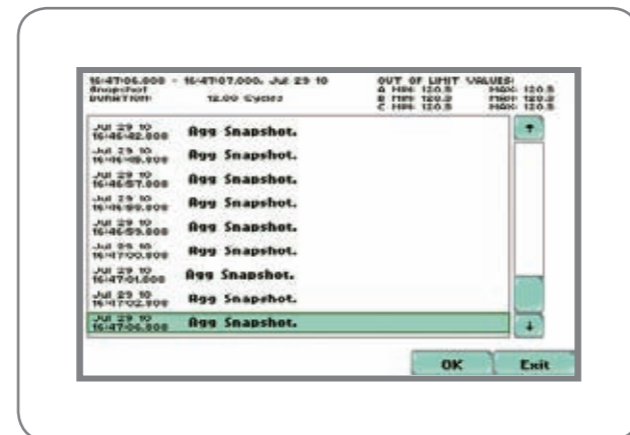
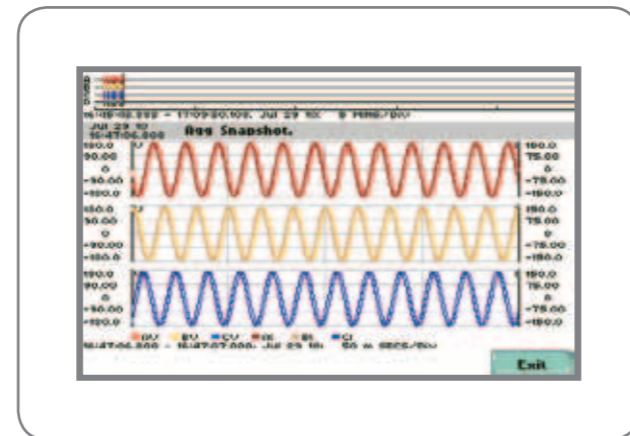
High Performance Mains Monitoring

The MAVOWATT 20 acquires more than 50 electrical parameters including general power parameters (U, I, P, PF, etc.), as well as energy and demand quantities, harmonics (THD, TID, individual harmonics) and other parameters such as energy import and export. Most parameters can be measured in real-time and displayed as a curve.

Progressive demand and energy consumption oriented reporting are key functions in the MAVOWATT 20, but with detection of RMS voltage fluctuation the instrument also covers mains quality to a given extent as well. L-N and L-L voltages are compared to a tolerance of $\pm 10\%$ from period to period.

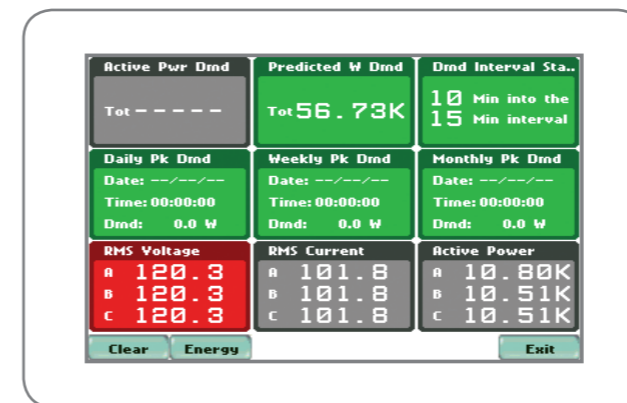
When a limit is violated, the respective event is entered to a chronological list as an easy-to-read text with time stamp and categorization as either a dip or a swell, as well as duration and the minimum/maximum value of the limit violation. Snapshots of voltage and current waveforms can be saved with DranView software at adjustable intervals for visual analysis of distortion and other evaluations.

We recommend the MAVOWATT 30, 40, 50 or 70 for comprehensive mains analyses which necessitate waveform recordings, transients or other mains quality parameters.



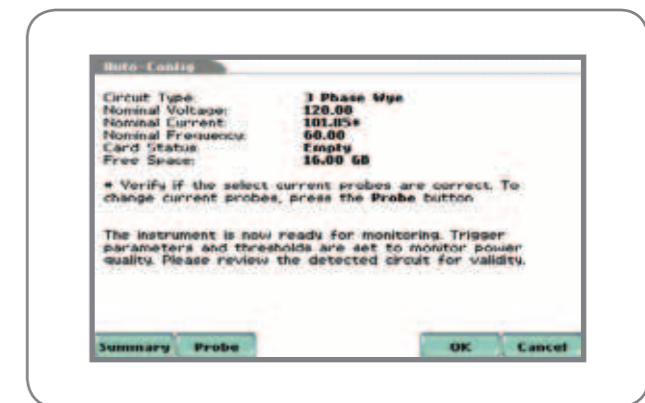
Clear-Cut Reports for Demand and Energy

Simple use and clear-cut display of the measured values are decisive with regard to the success of a measuring instrument. Demand and energy reports supplied by the MAVOWATT 20 compile all relevant information such as voltage, current, power, demand and energy, as well as calculated quantities, in an easy-to-understand, color-coded format. A gray field means that no limit values have been selected. Green indicates that the parameter lies within the selected limit values. If the lower or upper limit value is exceeded, the background color changes to yellow. Blinking red warns that the very high or very low limit value has been violated.



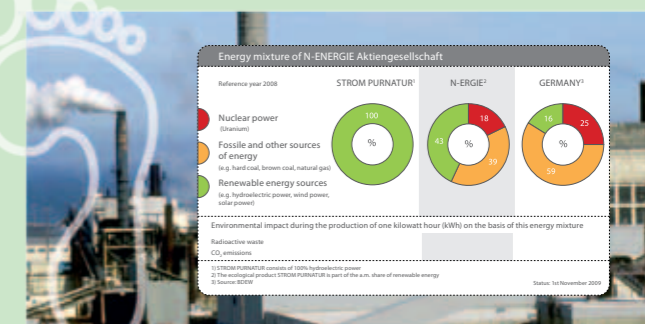
Harmonics

Increasing use of power electronics in air conditioning, computers, office machines and computer controlled production systems is generating more and more harmonics – and inherent susceptibility to interference is on the rise. And harmonics do indeed cause small, usually imperceptible power fluctuations which add up to considerable damage in the long-term. Current harmonics emitted from a single source can cause interference throughout the entire network. The MAVOWATT 20 is used for effective troubleshooting of complex problems of this sort, because it acquires detailed harmonics and sub-harmonics in accordance with IEC 61000-4-7.



CO₂ Balance

Environmental protection isn't just a slogan, it's a binding requirement. The CO₂ balance reflects all green house emissions which occur during power generation. Many power utilities publish a tariff-specific index for CO₂ emissions per kWh, which depends upon the utilized types of power generation. On the basis of this factor and measured energy consumption, the MAVOWATT 20 calculates the CO₂ balance and displays emissions in kg or lbs.

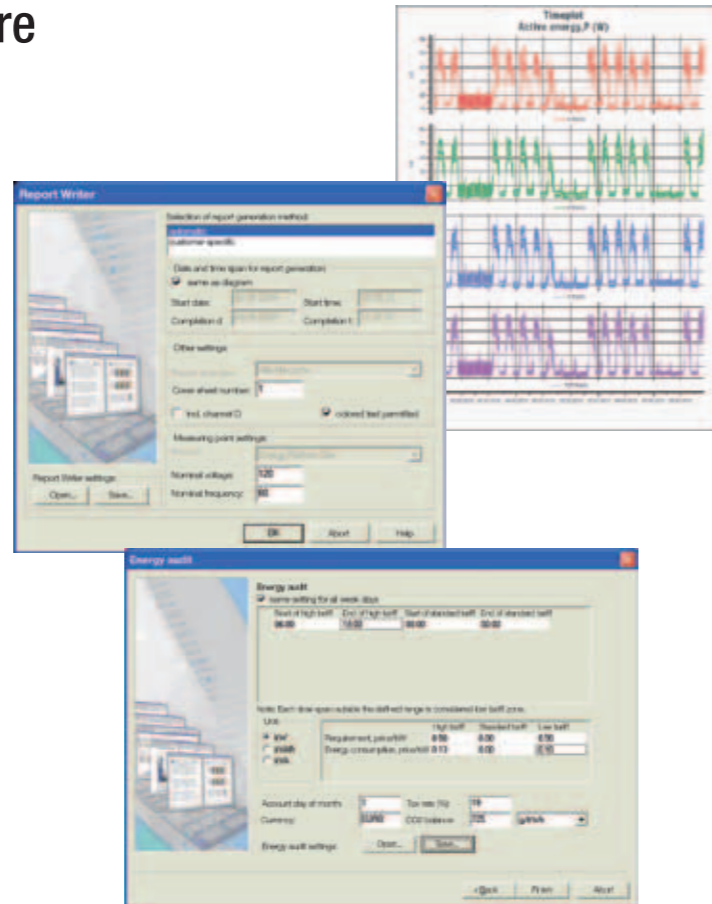


MAVOWATT 20 with Top Software

Energy Platform Report Writer Software (EPRW)

License-free Energy Platform Report Writer software is provided with each MAVOWATT 20, which summarizes measurements in configurable, easy-to-read reports. Characteristic curves for voltage and current, active, reactive, and apparent power, power factor, harmonics, import, energy and many other parameters can be summarized in a user configured report. If the automatic function is used, EPRW quickly generates a report without the need for any settings.

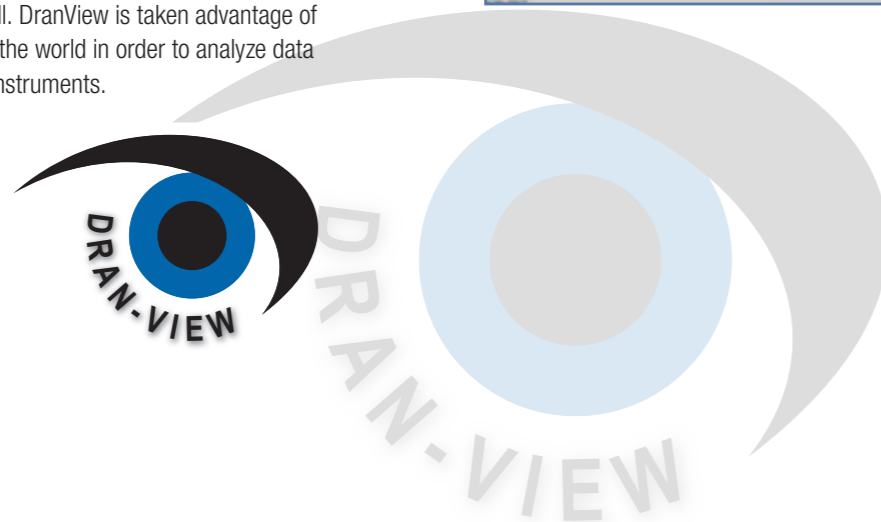
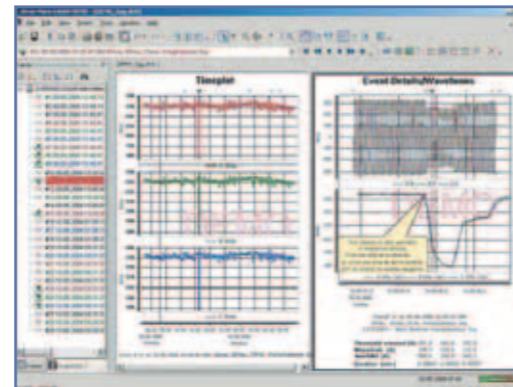
The energy audit report summarizes the energy measurement which consists of basic billing parameters such as tariff periods (peak, standard and off-peak), peak loads, energy costs and CO₂ balance. Comments and a company logo can be added to the reports. Reports are created in RTF format and can be edited with any word processing program. Data can be exported in CSV format, and can then be further processed with Microsoft Excel or other compatible software.



DranView Evaluation and Analysis Software

For demanding applications, the MAVOWATT 20 is compatible with award winning, high performance DranView software (option), which allows for comprehensive analyses. DranView includes expanded functions such as bookmarks, zoom, rubber bands, comments and mathematics, and is capable of incorporating company logos.

The integrated Rescue Kit subsequently corrects recording errors such as reversed current direction, incorrect scaling factors and system time. The DranView report generator offers numerous reports for all types of applications and now includes the energy audit report from EPRW as well. DranView is taken advantage of by thousands of users all over the world in order to analyze data from MAVOWATT measuring instruments.



Technical Data

Measured Parameters

- 4 voltage inputs for 1 to 600 V_{TRMS}, CAT III, AC-DC, 0.1% rdg., 256 samples per period, 16 bit ADC
- 4 current inputs for current sensors, 1 to 6000 A_{TRMS}, AC-DC, 256 samples per period, 16 bit ADC
- Frequency range 16/2/3, 45 to 65 Hz
- Phase lock loop – standard PQ mode

Functions and Conformity

- IEC/EN 61000-4-7, harmonic analysis
- EN 16001, energy management system
- IEEE 1159, PQ guidelines, events identification
- Continuous data logging for all measured quantities with min., max. and mean values within specified intervals
- Acquisition and recording of voltage dips/swells with time stamp and characteristic values

Measured Quantities

- U, I, P, S, Q, TPF, DPF, f, demand and energy
- THD harmonic spectrum (U, I, P), up to 63
- TID sub-harmonic spectrum (U, I) up to 63
- Crest factor, K factor, transformer derating factor, telephone interference factor, Asymmetry (deviation from RMS value and sequence components)
- W, VA, VAR, TPF, DPF, consumption, energy etc.

Available Menu Languages

- European version includes: English, French, Finnish, German, Italian, Polish, Spanish and Swedish
- Asian version includes: English, Chinese (simplified and traditional), Japanese, Korean and Thai

General Technical Data

Dimensions: 203 x 300 x 64 mm
 Weight: 1.8 kg
 Operating temperature: 0 to +50° C
 Storage temperature: -20 to +50° C
 Relative humidity: 10 to 90%, no condensation
 System time: system clock with quartz movement, resolution: 1 second
 Power pack/charger: 90 to 264 V AC, 47 to 63 Hz
 Battery operation time: 3 hours
 Display: color LCD touch-screen, 12x9.5 cm
 Data memory: high-speed compact flash ≥ 4 GB

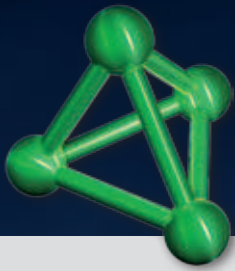
MAVOWATT 20 Sets

Energy and power analyzer including set of measurement cables, rechargeable battery, battery charger, CF memory card ≥ 4 GB, factory calibration certificate, operating instructions, EPRW software and carrying pouch

- MAVOWATT 20 Set 1**
MAVOWATT 20 and accessories (see above)
+ four TR-2500A AC current clamps (10 to 500 A)
- MAVOWATT 20 Set 2**
MAVOWATT 20 and accessories (see above)
+ four TR-2510A AC current clamps (1 to 10 A)
- MAVOWATT 20 Set 3**
MAVOWATT 20 and accessories (see above)
+ DRANFLEX 3003XL/24 three-phase AC current sensor (30/300/3000 A)
+ One DRANFLEX 3003XL/24 current sensor (30/300/3000 A)
+ RR/PSEURO mains power pack
+ RR/PS/4A adapter cable for 4 DRANFLEX
- MAVOWATT 20 Set 4**
MAVOWATT 20 and accessories (see above)
+ four TR-2550A AC current clamps (1 to 100 A)
- MAVOWATT 20 Set 5**
same as Set 3, plus 1 AC/DC current sensor clamp, PR150/SP2, 150 A, 9 V battery operated
- MAVOWATT 20 Set 6**
same as Set 3, plus 1 AC/DC current sensor clamp, PR150/SP8, 1500 A, 9 V battery operated

Optional Accessories:

- DranView PC software**
DranView Pro
DranView Enterprise
 - Flexible AC current sensors**
METRAFLEX3001XL: 30/300/3000 A, sensor length: 60 cm
METRAFLEX3003XL: 3-phase, 30/300/3000 A, sensor length: 60 cm
DRANFLEX3000XL: 30/300/3000 A, sensor length: 60, 90 or 120 cm
DRANFLEX3003XL: 3-phase, 30/300/3000 A, sensor length: 60, 90 or 120 cm
 - AC-DC current clamp sensors**
PR150/SP1: 150 A, 9 V battery
PR1500/SP7: 1500 A, 9 V battery
PR150/SP2: 150 A operation with additional power pack
PR1500/SP8: 1500 A operation with additional power pack
- BP-PX5: replacement battery pack
 XBC-PX5: external battery charger



GOSSEN METRAWATT

GMC-I Messtechnik GmbH

Südwestpark 15 ▪ 90449 Nürnberg ▪ Germany

Phone: +49-911-8602-111 ▪ Fax: +49-911-8602-777

www.gossenmetrawatt.com ▪ info@gossenmetrawatt.com