

MAVOLOG[®] 10L/N/S

Power Analyzer

3-349-028-03
5/1.08

Test Instrument for the Monitoring of Voltage Quality
and Power Analyzer for Long-Term Recording

Features

- **Monitoring of supply power quality**
with recording function for the simultaneous logging of up to 40 three-phase AC quantities
- **Internal voltage quality analysis**
in accordance with EN 50160 and/or industrial standards
- **640 k internal memory**,
capacity for various measuring and testing tasks can be configured in a user specific fashion
- **RS485 interface**
for the connection of up to 32 instruments to field bus and via coupling modules to Ethernet/Internet, telephone network
- **Alarm output for events messages**
- **PC software METRAwin[®]10** for MAVOLOG[®] as accessory for parameters configuration, evaluation and export of measurement data



Applications

Line Measurements and Power Disturbance Logging in Industrial Applications

- Recording phase currents and power quantities as mean and maximum values allows you to **recognize critical load conditions** and to **quantify remaining reserves** within the electrical system.
- By recording the corresponding power demand values, you can determine your own **characteristic load profile** in order to realize **energy cost reductions by means of diminished load peaks**.
- Energy consumption measurements within several distribution branches provide you with **greater energy consumption clarity**, and assure **correct billing of costs** to the appropriate departments or cost centers.
- The **effectiveness of utilized compensation equipment can be tested**, and associated cost saving potential can be determined with the help of reactive energy measurements.
- A greatly increased number of non-linear consumers gives rise to the growing occurrence of line voltage distortion (harmonics). Increased losses at power transmission equipment and certain types of consumers, as well as **overloading of compensation equipment and neutral conductors** represent additional consequences. This can be **prevented** by measuring harmonic voltages and currents, and neutral conductor current.
- Simultaneous logging of the load current profile in the event of voltage dips allows you to draw **conclusions regarding the cause** of this most common type of **disturbance** in industrial electrical networks. This provides you with a **basis for the clarification of malfunctions** of machines and equipment, or for the implementation of corrective measures.

Power Quality Monitoring within the Service Region of Power Utilities

MAVOLOG[®]10 offers long-term and synchronous logging of quality-related line voltage characteristics in accordance with EN 50160 from a great number of widely distributed measuring points on high, medium and low voltage level. For remote querying of data records you can either use cable-based or wireless communication lines. The data volume to be transmitted and managed in the central database is minimized by intelligent pre-processing of the measurement data in the instrument. The software packages on offer enable you to choose from a wide range of options for analyzing, documenting or exporting the data received to other programs.

MAVOLOG[®] 10L/N/S

Power Analyzer

Analyzer Variants

MAVOLOG[®] series instruments have been designed to allow for the selection of ideal configurations for all types of applications, from power generation (utilities) to consumer applications, in combination with multiple instruments or as a stand-alone. All models provide for comprehensive disturbance recording and voltage quality analysis with integrated harmonic analysis (FFT) and flicker measurement (FSA).

Equipped with an LCD and additional current inputs, the top of the line MAVOLOG[®]10S+FFT/FSA is a universal measuring instrument which can be used for recording the characteristics of all important measured quantities in 3-phase systems, and simultaneously acquires power disturbances and characteristics for the analysis of voltage quality.

Type	MAVOLOG [®] 10N +FFT/FSA	MAVOLOG [®] 10S +FFT/FSA
FEATURES	M830P	M830R
Voltage		
Measurement inputs	3x U _{L-L} /U _{L-N} & U _{N-PE}	3x U _{L-L} /U _{L-N} & U _{N-PE}
Dips, Interruptions	>10 ms	>10 ms
Swells	>10 ms	>10 ms
Asymmetry	●	●
Frequency	●	●
Harmonics	1 - 40 & THD	1 - 40 & THD
Flicker (Pst, PIt)	●	●
EN 50160 analysis	●	●
Current		
Measuring channels	○	3 x I _L & I _N
Characteristics in case of voltage dips	○	Resolution: 10 ms
Harmonics	○	1 - 40 & THD
Power / Energy		
Active power P1, P2, P3, PΣ	○	●
Apparent power SΣ	○	●
Reactive power QΣ	○	●
Power factor PFΣ	○	●
Active energy WPΣ	○	●
Reactive energy WQΣ	○	●
Alphanumeric LCD		
Measured values, analyses	10, selectable	10, selectable
Device configuration parameters	●	●

- available
○ not available

MAVOLOG[®] 10L/N/S

Power Analyzer

Compact Design

for wall or top-hat rail mounting

RS485 Interface

for connection to a standardized 2-wire bus with up to 32 users (9.6 to 115 kbits per second)

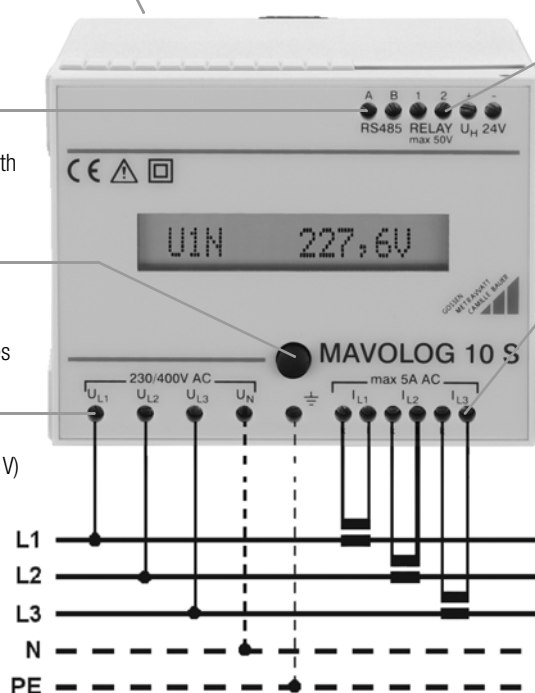
LCD with Display Selector Key

for on-site monitoring of

- Measured / analyzed values for 10 quantities
- Device settings

4 Voltage Measurement Inputs

with selectable measuring range (100 V / 400 V) and programmable transformer ratio for the measurement of U_{L-L} or U_{L-N} and U_{N-PE}



Relay Output

with temporary or continuous signal for indicating events

3 Current Inputs (MAVOLOG 10 S)

with selectable measuring range (1 A/5 A) and programmable transformer ratio for the measurement of I_L and indirect acquisition of I_N via an internal summation current transformer

Flexible Memory Organization

The available measurement data memory can be partitioned and/or used for the execution of various recording tasks. Ring mode or stop mode operation can be selected individually for both partitions.

Example

- 50% for interval measurement data of 40 measured quantities stored at 10 min intervals over more than 27 days
- 50% for event data, covering more than 25,000 events

Events Memory

Records line voltage anomalies chronologically. The following, simultaneously active trigger criteria can be configured to this end:

- Upper / lower 10 minute voltage limit value
- Upper / lower 10 ms voltage limit value
- Nominal frequency with tolerance
- 10 minute asymmetry limit value
- Plt flicker limit value*
- 10 minute voltage harmonics limit value*
- 10 minute THD_J limit value*
- N-PE voltage limit value

The following information is available for each event:

- Date and time
- Type of event / event-causing phase
- Measured value (e.g. magnitude and duration of a voltage dip)

*) fixed limit values per EN 50160

Interval Memory

Continuously records measurement data using an adjustable memory interval (1 or 10s, 1, 5, 10 or 15 min., 1 or 24 h). Depending upon the instrument type, up to more than 300 measured quantities or analyses are available.

Of these, up to 40 data retrieval points can be defined for simultaneous recording. Individually for each data point, logging of the instantaneous value (1 s mean value), the minimum value, the maximum value or the mean value during the interval period can be selected.

Signal Memory

Records time characteristics of voltage dips, failures or swells based upon 10 ms TRMS values within a 2 second window with a 25% pre-trigger. Recording of either the affected voltage signal only, or all voltage signals can be selected, and recording of current signals can also be selected with the MAVOLOG[®] 10S.

Statistics Memory

Statistically acquires all relevant data for the exclusive performance of conformity evaluation with regard to EN 50160 based upon counter readings. These include, for example, the number of voltage dips (classified) and interruptions, as well as the total duration of overvoltages and undervoltages, or other limit value violations.

This memory is always active and requires no parameters configuration. Its contents are continuously updated after resetting.

Daily Max. Value Memory

Records extreme values for line voltage each day at midnight, as well as for each harmonic which was maintained for 95% of the day.

With the MAVOLOG[®] 10S, measured maximum values for active and reactive power and phase current since the last reset, as well as energy consumption, are also saved to memory.

MAVOLOG[®] 10L/N/S

Power Analyzer

Applicable Regulations and Standards

IEC 61010-1/DIN EN 61010-1 / VDE 0411 Part1	Safety requirements for electrical equipment for measurement, control and laboratory use - general requirements
DIN EN 60529 VDE 0470 Part 1	Test instruments and test procedures Protection provided by enclosures (IP Code)
DIN 40110-1/-2	AC quantities, 2-wire/multiple-wire electric circuits
DIN EN 61326 VDE 0843 Part 20	Electrical equipment for measurement, control and laboratory use – EMC requirements
EN 61000-4-7 VDE 0847-4-7	Testing and measuring techniques – General guide on harmonics and interharmonics measurements and instrumentation, for power supply systems and equipment connected thereto
EN 61000-4-15 VDE 0847-4-15	Testing and measuring techniques – Flicker meters: functional description and design specification
EN 50160	Voltage characteristics in public electric power supply networks
NRS 048-2:1996	Electricity Supply – Quality of Supply – Classification of voltage clips (South Africa)

Technical Data

Voltage Measurement Inputs

Type	4 high impedance AC voltage inputs with common reference point for direct connection to 3~ low voltage systems or system-side voltage transformers
Measuring channels	Y: $U_{1-N}, U_{2-N}, U_{3-N}, U_{N-PE}$ Δ: $U_{1-2}, U_{2-3}, U_{3-1}, U_{N-PE}$
Measuring ranges	nominal Y/Δ 0...57,7/100 V~0...230/400 V~ maximum Y/Δ 0...75/130 V~0...300/520 V~
Transformation ratio	Uratio range 0.01...655350.01...65535
Measuring resolution	@ Uratio = 1 0.01 V/0.1 V
Overload withstand	600 V continuous
Input impedance	2.4 MΩ
Line frequency	50/60 Hz
Waveshape	Sinusoidal or distorted up to the 40 th harmonic

Current Measurement Inputs

Type	3 electrically isolated AC current inputs for direct current measurement or connection to a current transformer
Measuring channels	I_{L1}, I_{L2}, I_{L3} and I_N indirectly via internal summation current transformer
Measuring ranges	nominal 0 ... 1 A~0 ... 5 A~ maximum 0 ... 1,2 A~0 ... 6 A~
Transformation ratio	Iratio range 1...655351...65535
Measuring resolution	@ Iratio = 1 0.001 A/0.01 A
Overload withstand	12 A continuous; 50 A for 1 s
Input impedance	typical 40 mΩ
Nominal frequency	50/60 Hz
Waveshape	Sinusoidal or distorted up to the 40 th harmonic

Measuring functions

Logging	Simultaneous sampling of voltage and current measuring inputs with A-D conversion of instantaneous values
Sampling rate	6.4 kHz
Sampling resolution	12 Bit

Voltage / Current

Measuring method	True root mean square measurement (TRMS AC)
Measuring uncertainty	±(0.2% rdg. + 3 digits)

Frequency

Measuring range	45 ... 65 Hz
Measuring resolution	0.01 Hz
Measuring uncertainty	±0.05 Hz

Power

Measuring resolution	0.1 W (@Uratio=1, Iratio=1)
Measuring uncertainty	±(0.4% rdg. + 6 digits)

Harmonics

Measuring method	FFT (Fast Fourier Transformation), EN 61000-4-7
Measuring range	1 st to 40 th harmonic and THD
Measuring uncertainty	Class B per EN 61000-4-7

Flicker

Measuring method	Flicker meter per EN 61000-4-15
Measuring range	Pst (10 min), Plt (120 min)
Measuring uncertainty	per EN 61000-4-15 - 4% voltage fluctuation

Display

Display element	Alphanumeric LCD, 1 line (60 x 10 mm)
Display functions	10 selectable measured quantities, setting and device parameters, memory status active/inactive

Controls

1 key for scrolling through display

Real-Time Clock

Time format	Date	DD.MM.YYYY
	Time	hh:mm:ss,00
Resolution		10 ms
Drift		maximum 1 minute/month (= 25 ppm)
Adjustment/synchronization		PC system time is transferred via the data interface synchronized within approximately 0.1 s.

Alarm Output

Number	1 isolated switching output for signaling events by continuous or pulse signal with adjustable duration
Switching element	Relay contact; programmable as NO or NC
Switching capacity	50 V; 0.5 A
Allocation	Group alarm for all events; can be masked for flicker and harmonic

MAVOLOG® 10L/N/S

Power Analyzer

Memory

Memory type non-volatile flash memory

Setup Memory

Function Storage of device settings
Data retention time unlimited

Measurement Data Memory

Function Simultaneous storage of measurement series and events (qualitative and quantitative) in separate storage areas:
Interval memory: time-controlled recording of up to 40 measured quantities and analyses as measuring series with memory interval:
1 / 10 seconds
1 / 5 / 10 / 15 minutes
1 / 24 hours

Event memory: storage of event data (date and time, event type, event-causing phase, value) triggered by measured values with adjustable limit values for voltage quality characteristics per EN 50160

Signal memory: event-triggered storage of 10 ms TRMS value characteristics for voltage and current within a 2 second time window with a 0.5 second pre-trigger

Capacity 640 kB; can be partitioned
Operating mode FIFO memory (ring mode)
Overwrite-protected memory (stop mode)
Data retention time unlimited

Data Interface

Type bidirectional RS485 2-wire bus (conversion to RS232 with MAVOLOG®PS/C or C232/485 module)
Functions
- Configuration and querying of device parameters
- Querying of currently measured data (online)
- Querying of stored measurement data (offline)
- Firmware update
Bus capacity max. 32 users (without booster)
Transmission speed 9.6/19.2/57.6/115.2 kBaud (kBits per sec.)
Terminal resistance 1.2 kΩ

Auxiliary Power

Voltage range 18 ... 36 V DC
Power consumption max. 3 W
Hold-up time Device function: 100 ms at 24 V DC typ.
Real-time clock: > 12 hours

Reference Conditions

Frequency 50 Hz ±1 Hz
Temperature 23 °C ±2 K
Rel. humidity 50% ±5%
Auxiliary power 24 V DC ±10%
Measuring range 230 V, 1 A
Transformation ratio for voltage $U_{ratio} = 1$,
for current $I_{ratio} = 1$
 $\cos\phi$ 1
Waveshape Sinusoidal, harmonic distortion ≤ 1%

Electrical Safety

Measuring category CAT III per EN 61010-1 for 300 V to earth
Safety class II
Operating voltage 300 V

Test voltages (Type test (protective impedance))

Inputs to interface, auxiliary voltage, relay 3.7 kV AC
Inputs to housing 3.7 kV AC

Electromagnetic Compatibility (EMC)

Interference emission EN 61326:2002 class A
Interference immunity EN 61326:2002
EN 61000-4-2: 1995/A1: 1998
Feature A
8 kV atmosph. discharge
4 kV contact discharge
EN 61000-4-3: 1995/A1: 1998
Feature A
EN 61000-4-4: 1995 Feature A
EN 61000-4-5: 1995 Feature A
EN 61000-4-6: 1996 Feature A

Ambient Conditions

Temperature range Operation/function: 0 °C...+55 °C
Storage/transport: -25 °C...+75 °C
Relative humidity max. 90 %, no condensation allowed
Elevation up to 2000 m above sea level
Deployment indoors

Mechanical Design

Housing „CombiNorm“ housing for panel mounting or DIN top-hat rail (EN 50022/32mm)
Protection Housing: IP 40
Terminals: IP 00
Terminals Screw terminals max. 2.5 mm²
Dimensions 100 mm x 75 mm x 105 mm
Weight MAVOLOG®10L/N: approx. 280 g
MAVOLOG®10S: approx. 380 g

MAVOLOG® 10L/N/S

Power Analyzer

Accessory Components

Various accessory components for auxiliary power and communications functions are available for cost optimized utilization and ideal functionality of MAVOLOG® power analyzers in consideration of prevailing conditions at the installation site. This modular design concept allows for best-suited adaptation or expansion of the system in order to fulfill changing requirements.

MAVOLOG®PS/C (Z863D)

MAVOLOG®PS/C universal (Z863G)

The MAVOLOG®PS/C module (PS = power supply / C = converter) includes a power pack with a 24 V DC output for supplying power to as many as five MAVOLOG®10 instruments and one MAVOLOG®BP, as well as a bidirectional RS 232 – RS 485 interface converter for communication between a PC using MAVOLOG® control software, and each individual instrument. Up to 32 MAVOLOG®10 instruments can be connected to the RS 485 bus (max. length: 1 km, max. transmission speed: 115 kbps, half-duplex). The RS 485 and RS 232 interfaces are electrically isolated from each other, as well as from the power supply of the MAVOLOG®PS/C, in order to assure maximum operating reliability and interference immunity, in particular for interconnected PCs. The standard version is laid out for an input voltage of 230 V AC. The MAVOLOG®PS/C Universal variant has an AC/DC wide range input.



Power supply	Z863D	Z863G
Line voltage	230 V AC ±10%	50 ... 230 V AC ±10% 60 ... 320 V DC ±10%
Frequency	50 ... 60 Hz	0 ... 60 Hz
Power consumption	max. 46 VA	max. 30 VA
Consumption of nominal power	12 VA	20 VA
Fuse protection	internal PTC	internal PTC + fuse

DC Output	Z863D	Z863G
Open-circuit voltage	28 V	
Nominal voltage	24 V	20 V
Voltage @ I _{max}	18 V	
Nominal current	0,25 A	0,8 A
Max. load current	0,75 A	1,0 A
Residual ripple	< 1 Veff	< 0,4 Veff
Short-circuit protection	via electronic current limitation, indication of undervoltage	

Electrical safety

Safety class	II
Overvoltage category	CAT II

Mechanical Design	Z863D	Z863G
Dimensions (HxWxD)	75 x 55 x 111 [mm]	75 x 100 x 111 [mm]
Weight	ca. 800 g	350 g
Terminals	RS232: 9-pole sub-D jack RS485: 2 screw terminals A-B, screen Terminal resistance: internal 1.2 kΩ	

MAVOLOG®BP (Z863E)

The MAVOLOG®BP (BP = battery pack) is an uninterruptible DC emergency power supply which, in combination with the MAVOLOG®PS/C, automatically supplies power to connected MAVOLOG®10 instruments in the event of mains power failure.

Depending upon the number and type of instruments, they can be operated with a fully charged storage battery for up to 10 hours.

Integrated electronics regulate and monitor the charging process, assuring reliable availability of supply power and long storage battery service life.



Connection Data

Charging voltage	20 V DC ... 30 V DC
Discharge voltage	18 V DC ... 21 V DC
Charging current	„CHARGE“ 120 mA „STANDBY“ 20 mA
Overall power consumption	„CHARGE“ 150 mA „STANDBY“ 50 mA

Rechargeable Battery Characteristics

Charging time „CHARGE“	approx. 3 h
Max. discharge current	approx. 2 A, depending on condition of rechargeable battery
Type	15 x round cell 1.2 V, NiCd sintered accu
Nominal capacity	700 mAh
Service life	approx. 1,000 charging and discharge cycles approx. 3 ... 5 years buffer operation
Short-circuit protection	by automatic deactivation
Deep-discharge protection	by automatic deactivation
Overcharge protection	by temperature monitoring

Mechanical Design

Dimensions	75 mm x 55 mm x 109 mm (HxWxD)
Weight	approx. 480 g

MAVOLOG®DFÜ (Z864C)

The MAVOLOG®DFÜ dial-up modem connects the installed MAVOLOG® power monitoring system to a master computer via public telephone lines for remote parameters configuration, control and data queries.

An SMS message can be transmitted to a cell phone or a fax machine etc., in the event of a power disturbance.



Transmission speed	33,600 kbps
Power supply	10 ... 80 V DC, via MAVOLOG®PS/C
Dimensions	75 mm x 55 mm x 110 mm (HxWxD)
Weight	approx. 250 g

Further ISDN, GSM, Ethernet modem types available on request.

MAVOLOG[®] 10L/N/S Power Analyzer

Joint Technical Data for MAVOLOG[®]PS/C, MAVOLOG[®]BP and MAVOLOG[®]DFÜ

Ambient Conditions

Operating temperatures –10 °C ... +50 °C
Storage temperatures –20 °C ... +60 °C
Deployment indoors
Elevation max. 2000 m above sea level

Electrical Safety

Contamination degree 2

Electromagnetic

Compatibility (EMC) DIN EN 61326, VDE 0843 Part 20

Mechanical Design

Protection terminals: IP20, housing: IP40

Extract from table on the meaning of IP codes

IP XY (1 st digit X)	Protection against foreign object entry	IP XY (2 nd digit Y)	Protection against the penetration of water
0	not protected	0	not protected
1	≥ 50.0 mm Ø	1	vertically falling drops
2	≥ 12.5 mm Ø	2	vertically falling drops with enclosure tilted 15°
3	≥ 2.5 mm Ø	3	spraying water
4	≥ 1.0 mm Ø	4	splashing water

Housing Plastic housing for snap-on mounting on standard profile rail DIN EN 50022/ 35 x 15 or wall mounting

Terminals Screw terminals, max. cable diameter 2.5 mm²

METRAwin[®] 10 - Parameters Configuring and Analysis Software

METRAwin[®]10 for MAVOLOG[®] software is used for configuring parameters and visualizing data from the MAVOLOG[®]10.

It includes the following functions:

- Configuration of device parameters (connection and memory parameters)
- Memory mode initialization
- Print-out of complete or daily statistics
- Visualization of interval data
- Events data formatted as a list and visualization of 10 ms TRMS values of respective event curves
- Representation of harmonics
- Online visualization of selected measured quantities

PC.doc-ACCESS Database and Report Generating Software

PC.doc-ACCESS for MAVOLOG[®]10 is a database program based on Microsoft Office products including WinWord, Excel and Access for the management, presentation and documentation of data recorded with the MAVOLOG[®]10.

The database software allows for the management of data from any number of MAVOLOG[®]10 instruments, and for interactive or automated, time-controlled querying with the help of a scheduler.

The software provides for comprehensive, detailed long-term analysis of voltage quality within a supply network including multiple measuring stations.

Please refer to our MAVOLOG[®]10 brochure for further information on the analysis software.

MAVOLOG[®] Mobil-Set (M830W)

Consisting of the following components, which are wired and installed to a sturdy case (46 x 16 x 35 cm):

- MAVOLOG[®]10S+FFT/FSA – power quality analyzer
- MAVOLOG[®]PS/C – mains power pack & interface converter
- MAVOLOG[®]BP – battery pack

Included accessories:

- Connector cables for
 - mains supply power,
 - voltage measurement inputs including alligator clips
 - RS232 interface
- Parameters configuring and analysis software METRAwin[®]10 for MAVOLOG[®]

The case has ample additional space for stowing optionally available clip-on current transformers, e.g. 3 each Z3512 (1000/1 A).



Suitable Clip-on Current Transformers

Type	Nominal Measuring Range	Transformation Factor A/A	Inherent Deviation	max. Cable Diameter
M1	0.1 ... 300 A~	100:1	2% rdg.	15 x 17 mm
SM	0.5 ... 600 A~	500:5	1% rdg.	54 mm
Z3512	0.5 ... 1000 A~	1000:1	0.7% rdg.	52 mm
Z3514	1 ... 2000 A~	2000:1	0.7% rdg.	64 x 150 mm

Frequency Range 40 Hz ... 5 kHz

Terminals 2 safety banana plugs 4 mm

Cable length Z3512/Z3514: approx. 1.5 m
M1 / SM: approx. 2 m



MAVOLOG® 10L/N/S

Power Analyzer

Order Information

Description	Type	Article number
3-phase voltage quality analyzer and test instrument for power quality per EN 50160 in CombiNorm housing including harmonic and flicker analysis, with LCD for display of measurement data, without software, incl. operating instructions	MAVOLOG® 10N+FFT/FSA	M830P
same as MAVOLOG® 10N+FFT/FSA, additional current measuring inputs and power/energy analysis	MAVOLOG® 10S+FFT/FSA	M830R
Portable power analyser consisting of MAVOLOG® 10S+FFT/FSA, MAVOLOG® PS/C, MAVOLOG® BP installed to a metal case, including mains cable, RS232 interface cable, voltage measurement cables with test probes and alligator clips, software METRAwin® 10 for MAVOLOG®.	MAVOLOG® 10 Mobil-Set	M830W
Additional Components		
Mains power pack 230 V~/24 V- for power supply to the MAVOLOG® and MAVOLOG® BP instruments, plus incorporated interface converter RS485/RS232	MAVOLOG® PS/C	Z863D
same as MAVOLOG® PS/C, however, with wide-range mains power pack 60 ... 320 V DC and 50 ... 230 V AC	MAVOLOG® PS/C universal	Z863G
Battery pack for emergency power supply to MAVOLOG® instruments in the event of a mains failure	MAVOLOG® BP	Z863E
Analog telephone modem in CombiNorm housing for remote data transfer	MAVOLOG® DFÜ	Z864C
Accessories		
Clip-on current transformer 0.5 ... 1000 A~, 1 mA / A~ with cable and protective circuit	Z3512	GTZ3512000R0001
Clip-on current transformer 1 ... 2000 A~, 1 mA / A~ with cable and protective circuit	Z3514	GTZ3514000R0001
Software		
Parameters configuring and analysis software for MAVOLOG® in German and English	METRAwin® 10 for MAVOLOG®	Z852D
Data base software based on MICROSOFT® OFFICE WORD™, EXCEL™ and ACCESS™ for management and documentation of MAVOLOG® 10 data (German/English) up to 20 controllable devices, more devices upon request	PC.doc-ACCESS for MAVOLOG®	Z852F

Special Accessories from our Project Planning Range

Description	Type	Article Number
Clip-on current transformer 100 A~ / 1 A~ with 2 m connector cable set and 4 mm safety banana plug	Model M1	
Clip-on current transformer 300 A~ / 5 A~ with 2 m connector cable set and 4 mm safety banana plug	Model SM	
Clip-on current transformer 500 A~ / 5 A~ with 2 m connector cable set and 4 mm safety banana plug	Model SM	
Clip-on current transformer 1000 A~ / 5 A~ with 2 m connector cable set and 4 mm safety banana plug	Model SM	
Converter USB → RS232	Cable converter	

Edited in Germany • Subject to change without notice • A pdf version is available on the Internet.

GMC-I  GOSSEN METRAWATT

GMC-I Gossen-Metrawatt GmbH
Thomas-Mann-Str. 16-20
90471 Nürnberg • Germany

Phone +49 911 8602-111
Fax +49 911 8602-777
E-Mail info@gossenmetrawatt.com
www.gossenmetrawatt.com