GOSSEN METRAWATT

METRAHIT | PM PRIME & METRAHIT | PM PRIME BT

Professional Multimeters / High Resolution TRMS Digital Multimeters

3-349-683-03
15/6.23

- Handheld digital multimeter with TRMS measurement including, amongst other measuring functions:
  V AC TRMS, V AC+DC TRMS, V DC,
  A AC TRMS, A AC+DC TRMS, A DC
  dB, Hz(V), Hz(A), Ω, V⊣▶⊢, °C / °F (TC/RTD)
- Resolution of 310,000 digits, triple display, display illumination can be activated under difficult lighting conditions
- 1 kHz / –3 dB low-pass filter can be activated in the alternating voltage measuring ranges
- 1 nA … 10 A direct current measurement, 16 A short-term and current measurement with current clamp transformers and sensors (transformation ratio is accounted for by the display)
- Temperature measurement with Pt100/Pt1000 resistance thermometer
- Broad range capacitance measurement
- TRMS AC and AC + DC, 100 kHz bandwidth
- Measurement data memory for up to 300,000 measured values
- Instrument can be **remote controlled** via IR interface with optional accessory: USB X-TRA (Z216C)
- Instrument can be **remote controlled via** Bluetooth interface (METRAHIT PM PRIME BT only)
- Connector jack for external power pack

3 YEARS WARRANTY

CAT IV

MADE IN GERMANY

ilac-MRA DAkkS Deutsche Akkreditierungsstelle D-K-15080-01-01

Applications

The instruments included in the so-called Professional series (E series or High Resolution series) are extremely rugged, reliable digital multimeters with housings made of impact resistant ABS. With a resolution of 310,000 digits and roughly 30 different measuring functions, they've been developed for professional use.

Features

RMS Value with Distorted Waveform

The utilized measuring method allows for waveform independent TRMS measurement (TRMS AC and AC+DC) for voltage (up to 100 kHz) and current (up to 10 kHz).

Activatable Filter for V AC Measurement

A 1 kHz low-pass filter can be activated if required, for example when measuring motor voltage at electronic frequency converters. The input signal is checked by a voltage comparator for dangerous voltages as long as the low-pass filter is activated. A high-voltage symbol appears at the display if dangerous voltage (> 45 V) is present.

Automatic / Manual Measuring Range Selection

Measured quantities are selected by means of a rotary switch and a function key. The measuring range is automatically matched to the measured values. The measuring range can also be selected and locked manually with a key.

Three Connector Jacks with Automatic Blocking Sockets (ABS) *

All current ranges are routed via a single connector jack which prevents any possibility of operator error. Auto-ranging is available in all current measuring ranges. Beyond this, the automatic blocking sockets prevent incorrect connection of the measurement cables, as well as selection of the wrong measured quantity. Danger to the user, the instrument and the device under test resulting from operator error is thus ruled out.

* Patented (patent numbers EP 1801 598 and US 7,439,725)

Overload Protection

Overload protection safeguards the instrument in all measuring functions for up to 600 V. Voltages of greater than 600 V and currents of greater than 10 or 16 A are indicated acoustically. Dangerous touch voltages are indicated when the 1 kHz low-pass filter has been activated.
FUSE appears at the display if the fuse for the current measuring input blows. Switching between high and low impedance measuring functions is disabled in the vent of dangerous touch voltage.

Measurement with Current Clamp Transformers and Sensors

Current transformer clamps and sensors are used for current measurements without interrupting the circuit under test, and for high amperages (> 16 A). The measured current value is automatically calculated and displayed for the user with the help of the adjustable clamp factor.

Fast Acoustic Continuity Test

Testing for short circuiting and interruption is possible with the selector switch in the))) position. The threshold value for acoustic signaling can be set to 1, 10, 20 … 300 Ω in 10 Ω steps.

METRAHIT | PM PRIME & METRAHIT | PM PRIME BT
Professional Multimeters

Automatic Storage of Measured Values *

The DATA function automatically saves the digitally displayed measured value after settling in. Acoustic signaling is also used to indicate whether the new measured value deviates from the initial reference value less or more than 0.1% of the measuring range.
* Patented

Storage of Min-Max Values

Comparable to the slave-pointer function of an analog instrument, the device saves the highest and lowest measured values after the Min-Max function has been activated or reset. These extreme values can be queried at the display.

Memory Mode Operation

The instrument is equipped with measurement data memory (2 MB) which is synchronized by means of a quartz-movement and has enough capacity for up to 300,000 measured values depending upon configuration. This allows for use of the instrument as an autonomous real-time data logger.

Measurement data recording is executed either:

- Time-controlled with an adjustable storage interval ranging from 0.1 s to 9 hours
- Dependent upon measured value in the event of exceeded limit/delta value
- Automatically after the measured value settles in
- As an individual measured value by pressing a key

Memory content can be read out from a PC via the data interfaces described below and analyzed and documented with METRAwin 10 evaluation software.

Battery Charging Status – Power Saving Circuit

The battery charging status is indicated by means of four symbols.

The device is switched off automatically if the measured value remains unchanged for a period of between 10 and 59 minutes (adjustable), and if none of the controls are activated during this time. Automatic shutdown can be disabled by switching the instrument to continuous operation. The standby mode for the infrared/Bluetooth interface can be deactivated.

Protective Cover for Harsh Conditions

The instrument is protected against damage in the event of impacts or dropping by means of a soft rubber cover with tilt stand and test probe holder. The rubber material also assures that the instrument does not wander if it is set up on a vibrating surface.

Data Interfaces

The device can be remote configured from the PC, and momentary and saved measurement data can be read out via the bidirectional infrared interface. The optional USB X-TRA interface adapter is required to this end.
With the METRAHIT PM PRIME BT (M248B), this connection can be established conveniently via Bluetooth as an alternative.

For both connections, either METRAwin 10 (see accessories) or a terminal program is required (interface protocol available upon request).

Furthermore, connection with Android devices (smartphone or tablet) is possible via Bluetooth and the multimeter can be used in combination with the METRALOG smartphone app.

DAkkS Calibration Certificate

Each multimeter is individually adjusted, subjected to final inspection and calibrated. Adherence to the specification is confirmed by means of the included DAkkS calibration certificate, which is valid worldwide (recognized by EA and ILAC). After the specified calibration interval has elapsed (recommended interval: 1 to 3 years), the multimeters can be recalibrated at any time in our own DAkkS calibration laboratory.

Applicable Regulations and Standards

IEC/EN 61010-1/ VDE 0411-1	Safety requirements for electrical equipment for measurement, control and laboratory use – Part 1: General requirements
DIN EN 61326-1/ VDE 0843-20-1	Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements
DIN EN 60529/ DIN VDE 0470 – Part 1	Test instruments and test procedures – degrees of protection provided by enclosures (IP code)

Included Features

Function	METRAHIT PM PRIME / METRAHIT PM PRIME BT
Voltage V_{DC} (Ri = 10 MΩ)	✓
Voltage V_{AC} TRMS (Ri = 5 MΩ)	✓
Voltage V_{AC+DC} TRMS (Ri ≥ 5 MΩ)	✓
Frequency, Hz @ V_{AC}, V_{AC+DC}	… 300 kHz
1 kHz low-pass filter	@ V_{AC} @ V_{AC+DC}
Bandwidth @ V_{AC+DC} or V_{AC}	100 kHz
Pulse frequency, MHz @ 5 V TTL	1 Hz … 1 MHz
Duty cycle as %	2.0% ... 98%
Voltage level measurement, dB	@ V_{AC} @ V_{AC+DC}
Resistance Ω	✓
Continuity test where ICONST = 1 mA	✓
Diode test where I_{CONST} = 1 mA	✓
Temperature measurement °C/°F @T_C	Type K
Temperature measurement °C/°F R_{TD}	Pt100/Pt1000
Capacitance measurement in F	✓
Current, A_{DC}	300 µA / 3 mA 30mA/300mA 3 A / 10 A (16 A)
Current, A_{AC+DC} TRMS	
Current, A_{AC} TRMS	
Bandwidth @ A_{AC+DC} or A_{AC}	10 kHz
Frequency, Hz @ A_{AC} @ V_{AC+DC}	… 30 kHz
Measurement with current clamp with adjustable transformation ratio	⟂ mV / A ⟂ mA / A
Data logger function [1] (memory)	16 MBit (2 MB)
Relative value measurement ΔREL	✓
Zero point	✓
Min / Max / Data Hold	✓
IR interface (38.4 kBd)	✓
Bluetooth interface (38.4 kBd)	METRAHIT PM PRIME BT only
Power pack socket	✓
Rubber holster	✓
Fuse	10 A, 1000 V
Protection	IP 52
Measuring category	600 V CAT III 300 V CAT IV
DAkkS calibration certificate	✓

[1] 16 MBit = 2048 kByte = 300,000 measured values, sampling rate adjustable from 0.1 s to 9 h

Scope of Delivery

1 Multimeter
1 KS17-2 cable set
2 Batteries, 1.5 V, type AA
1 DAkkS calibration certificate
1 Rubber holster
1 Condensed operating instructions*

* Complete operating instructions are available for download from the Internet at www.gossenmetrawatt.com.

Extended, Voluntary Manufacturer's Guarantee

36 months for materials and workmanship
1 to 3 years for calibration (depending upon application)

Characteristic Values

Meas. Function	Measuring Range	Resol. at Upper Range Limit DC 309,999	AC/AC+DC 30,999	3099	Input Impedance ⎓	Input Impedance ~ / ≂	Intrinsic Uncertainty at Reference Conditions ±(… % rdg.+ % MR + … d) ⎓	±(… % rdg.+ … d) ~	±(… % rdg.+ … d) ≂ [2]	Overload Capacity [12] Value	Time
V	300 mV	1 µV	10 µV		>10 MΩ	> 5 MΩ // < 50 pF	|0, 02| + 0.005 + 10 with ZERO	|0.5| + 30 [2]	|0.5| + 30	600 V DC AC RMS sine	Max. 10 s
	3 V	10 µV	100 µV		>10 MΩ	> 5 MΩ // < 50 pF	|0,02| + 0.005 + 5	|0.2| + 30 [1]	|0.5| + 30		Cont.
	30 V	100 µV	1 mV		>10 MΩ	> 5 MΩ // < 50 pF	|0,02| + 0.005 + 5				
	300 V	1 mV	10 mV		>10 MΩ	> 5 MΩ // < 50 pF	|0,02| + 0.005 + 5				
	600 V	10 mV	100 mV		>10 MΩ	> 5 MΩ // < 50 pF	|0,02| + 0.005 + 5	|0.2| + 30	|0.5|+ 30		
					Display Range for Reference Voltage U_{REF} = 0.775 V			Intrinsic Uncertainty			
dB	0.3 V / 3 V … 600 V~			0.01 dB	−42 dB … +57 dB			0.1 dB (U > 10% MR)		600 V AC RMS sine	Cont.
		DC	AC/AC+DC		Voltage Drop at Approx. Range Limit		⎓	~ [2]	≂ [2]		
A	300 µA	1 nA	10 nA		65 mV		|0.05 + 0.02 + 5 with ZERO	|0.5| + 30	|0.5| + 30	0.7 A	Cont.
	3 mA	10 nA	100 nA		170 mV		|0.05| + 0.01 + 5				
	30 mA	100 nA	1 µA		170 mV		|0.02| + 0.01 + 5				
	300 mA	1 µA	10 µA		200 mV		|0.1| + 0.05 + 5				
	3 A	10 µA	100 µA		150 mV		|0.2| + 0.05 + 5 with ZERO	|0.7| + 30	|0.7| + 30	10 A: ≤ 5 min. [10] [11]	
	10 A	100 µA	1 mA		470 mV		|0.2| + 0.05 + 5	|0.5| + 30	|0.5| + 30	16 A: ≤ 30 s [11]	
	Factor: 1:1/10/100/1000		Input		Input Impedance						
A ⩾	0.03/0.3/3/30 A		30 mA		Current measurement input (A socket)		See current measuring ranges for specification. Plus current transformer clamp error			Meas. input 0.7 A continuous 3 A: 5 min.	
	0.3/3/30/300 A		300 mA								
	3/30/300/3000 A		3 A								
A ⩾	0.3/3/30/300 A 3/30/300/3000 A		300 mV 3 V / 30 V		Voltage measurement input (V jack) Ri =5 MΩ/10 MΩ		See voltage measuring ranges for specification.			Meas. input 600 V TRMS	
					Open-Circuit Voltage	Measuring current at range limit	±(… % rdg.+ % MR … d)				
Ω	300 Ω	1 mΩ			< 2 V	Approx. 0.5 mA	|0.05| + 0.01 +5 with active ZERO function			600 V DC AC RMS sine	Max. 10 s (PTC)
	3 kΩ	10 mΩ			< 2 V	Approx. 130 µA	|0.05| + 0.01 + 5 with active ZERO function				
	30 kΩ	100 mΩ			< 2 V	Approx. 20 µA	|0.05| + 0.01 + 5				
	300 kΩ	1 Ω			< 2 V	Approx. 2 µA	|0.05| + 0.01 + 5				
	3 MΩ	10 Ω			< 2 V	Approx. 1 µA	|0.1| + 0.02 + 5				
	30 MΩ	100 Ω			< 2 V	Approx. 200 nA	|1| + 0.2 + 5				
	300 Ω	—		0.1 Ω	< 4.5 V	Approx. 1 mA const.	|1| + 5 with active ZERO function			600 V	Max. 10 s
	4,5 V [3]	—		1 mV	< 6 V	Approx. 1 mA const.	|0.2| + 3			600 V	Max. 10 s
					Discharge Resistance	$U_{0\ max}$	±(… % rdg.+ … d) [4]				
F	3 nF	—	—	1 pF	1 MΩ	2 V	|2| + 15 with active ZERO function			600 V DC AC RMS sine	Max. 10 s
	30 nF	—	—	10 pF	1 MΩ	2 V	|1| + 6 with active ZERO function				
	300 nF	—	—	100 pF	100 kΩ	2 V	|1| + 6				
	3 µF	—	—	1 nF	100 kΩ	2 V					
	30 µF	—	—	10 nF	10 kΩ	2 V					
	300 µF	—	—	100 nF	2.5 kΩ	2 V	|5| + 6				
	3 mF	—	—	1 µF		2 V					
						f_{min} [5]	±(… % rdg.+ … d)				
Hz (V)	300 Hz	0.001 Hz				5 Hz	|Hz(V) 0.05| + 2 [8]			Hz (V) [6], Hz(A⩾) [6] 600 V Hz (A): [7]	Max. 10 s
Hz (A)	3 kHz	0.01 Hz					|Hz(A) 0.05| + 3 [8]				
Hz (A⩾)	30 kHz	0.1 Hz									
Hz (V)	300 kHz	1 Hz				10 Hz					
MHz	300 Hz	0.001 Hz				1 Hz	|0.05| + 2	High level: 3 … 5 V	unipolar signal	600 V	Max. 10 s
	3 kHz	0.01 Hz									
	30 kHz	0.1 Hz									
	300 kHz	1 Hz									
	1 MHz	10 Hz									
							absolute intrinsic uncertainty				
%	2.00 to 98.00%		—	0.01%	15 Hz … 1 kHz		± 0.2 %	High level: 3 … 5 V	uni or bipolar signal	600 V	Max. 10 s
	5.00 to 95.00%		—	0.01%	1 kHz … 10 kHz		± (0.1 % + 0.10 % / kHz)	High level: 3 … 5 V	unipolar signal		
							± (0.1 % + 0.15 % / kHz)		bipolar signal		
							±(… % rdg.+ … d)				
°C/°F	Pt 100 / Pt 1000	− 200,0 … + 100.0 °C / + 100.0 … + 850.0 °C	0.1 K				|0.3| + 10 [9]			600 V DC/AC RMS sine	Max.10 s
	K (NiCr-Ni)	− 250.0 … + 1372.0 °C					|1 %| + 2.0 K [9]				
	Int. temp. meas.	− 10 … + 80 °C	0.1 K		Auxiliary display in ampere range		±2 K				

1 Specified accuracy valid as of 1% of the measuring range.
2 Specified accuracy valid as of 2% of the measuring range.
3 Display up to 4.5 V, "OL" for higher values.
4 Applies to measurements at film capacitors during battery operation
5 Lowest measurable frequency for sinusoidal measuring signals symmetrical to the zero point
6 Overload capacity of the voltage measurement input: Power limiting: frequency × voltage max. 3×10^6 V × Hz where U > 100 V
7 Overload capacity of the current measurement input: see current measuring ranges for max. current values
8 Input sensitivity, sinusoidal signal: 10% … 100% of the voltage/current range; in the 300 kHz range, specified intrinsic uncertainty is valid as of 15% of the measuring range.
9 Plus sensor deviation
10 As of a measured value of 7 A, measurement is limited to an ambient temperature of 30 °C or a maximum duration of 5 minutes.
11 Off-time > 30 min. and $T_A \leq 40$ °C after a 10 or 16 A measurement
12 At 0 ° … + 40 °C

Key d = digit(s), MR = measuring range, rdg. = reading (measured value)

Professional Multimeters

Influencing Quantities and Influence Error

Influencing Quantity	Sphere of Influence	Measured Quantity/ Measuring Range [1]	Influence Error (|…% rdg.| + … d) / 10 K
Temperature	0 °C … +21 °C and +25 °C … +40 °C	V ⎓	|0.05| + 5
		V~, V ⎓~, dB	|0.2| + 10
		300 Ω … 30 MΩ, ◁))	|0.1| + 10
		A ⎓, A~, A ⎓~	|0.3| + 10
		30 nF, 300 nF, 3 µF, 30 µF	|0.5| + 10
		3 nF, 300 µF	|3| + 10
		Hz	|0.05| + 5
		⊣◁	|0.1| + 5
		°C/°F (Pt100/Pt1000)	|0.1| + 10
		°C/°F thermocouple K [2]	|0.1| + 10

[1] With zero balancing
[2] Prerequisite: stable ambient temperature (t > 30 min.)

Influencing Quantity	Measured Quantity	Influence Error (… % rdg. + … d)
DATA	V, A, Ω, Hz, dB, °C	±10 d
MIN / MAX	V, A, Ω, Hz, dB, °C	±30 d

Influencing Quantity	Measured Quantity Measuring Range		Sphere of Influence	Intrinsic Uncertainty ±(|… % rdg.| + … d) [1]
Frequency	V_{AC} V_{AC+DC}	300.00 mV … 30.000 V	> 15 Hz … 45 Hz	|2| + 30
			> 65 Hz … 1 kHz	|1| + 30
			> 1kHz … 20 kHz	|2| + 30
			> 20kHz …100 kHz	|3| + 30 [2]
		300.00 V [3] 600.00 V [3]	> 15 Hz … 45 Hz	|2| + 30
			> 65 Hz … 5 kHz	|2| + 30
			> 5kHz … 20 kHz	|3| + 30
	I_{AC} I_{AC+DC}	300 µA … 10 A	> 15 Hz … 45 Hz	|3| + 30
			> 65 Hz … 10 kHz	

[1] Intrinsic uncertainty in the V AC ranges applies as of 1% of the measuring range.
[2] Signals > 50 kHz: plus 5%
[3] Power limiting: frequency × voltage max. 3×10^6 V × Hz where U > 100 V

Influencing Quantity	Sphere of Influence	Measured Quantity Measuring Range	Influence Error [5]
Crest factor CF	1 to 3	V~, A~	|± 1 % rdg.|
	> 3 … 5		|± 3 % rdg.|

[5] Except for sinusoidal waveform

Influencing Quantity	Sphere of Influence	Measured Quantity	Influence Error
Relative humidity	75% 3 days Instrument off	V ⎓ , V~, Ω, A, Hz, °C	1 × intrinsic uncertainty
Battery voltage	2.0 … 3.6 V	V, A, Ω, F, Hz, dB, °C	Included in intrinsic uncertainty

Influencing Quantity	Sphere of Influence	Measured Quantity Measuring Range	Damping
Common Mode Interference Voltage	Interference quantity max. 600 V~	V ⎓ (3 V … 600 V MR)	> 120 dB
	Interference quantity max. 600 V~ 50 Hz … 60 Hz, sine	3 V~	> 60 dB
		30 V~	> 65 dB
		300 V/600 V~	> 50 dB
Series mode interference voltage	Interference quantity: V~, respective nominal value of the measuring range, max. 600 V~, 50 Hz … 60 Hz sine	V ⎓	> 70 dB
	Interference quantity max. 600 V–	V~	> 120 dB

Reference Conditions

Ambient temperature	+23 °C ±2 K
Relative humidity	40 … 75% (no condensation allowed)
Measured qty. frequency	45 … 65 Hz
Meas. quantity waveform	Sinusoidal
Battery voltage	2.0 … 3.2 V

Response Time (after manual range selection)

Measured Quantity Measuring Range	Digital Display Response Time	Measured Quantity Jump Function
V ⎓, V~, dB A ⎓, A~	1.5 s	From 0 to 80% of upper range limit value
3 nF … 300 µF	max. 3 s	
300 Ω … 3 MΩ	3 s	From ∞ to 50% of upper range limit value
30 MΩ	8 s	
Continuity	< 50 ms	
°C (Pt100)	max. 3 s	
⊣◁	1.5 s	
>10 Hz	1.5 s	From 0 to 50% of upper range limit value

Data Interface – Infrared

Type	Optical via infrared light through the housing
Data transmission	Serial, bidirectional (not IrDa compatible)
Protocol	Device specific
Baud rate	38,400 baud
Functions	Connection to PC (USB X-TRA interface adapter and METRAwin 10 software required, see accessories): – Select/query measuring functions and parameters – Query momentary measurement data – Read out stored measurement data

Data Interface – Bluetooth (METRAHIT PM PRIME BT only)

The METRAHIT PM PRIME BT Bluetooth multimeter variant is identical to the METRAHIT PM PRIME, except that it is also equipped with a Bluetooth interface.

Bluetooth version	2.1 + EDR
Frequency range	2.4 … 2.4835 GHz
Transmission intensity	Max. 2.5 mW (class 2)
Range	Approx. 20 m (depending on propagation conditions)
Functions	Connection to PC (METRAwin 10 software required, see accessories): – Select/query measuring functions and parameters – Query momentary measurement data – Read out stored measurement data Connection to Android device (smartphone, tablet) with METRALOG app – Display of multimeter's measured values – Recording of measuring operations – Transmission of logs via wireless and network services – Trigger in the event of exceeding or falling short of an adjustable limit value – Acoustic warning if trigger event occurs

Internal Clock

Time format	DD.MM.YYYY hh:mm:ss,0
Resolution	0.1 s
Accuracy	±1 minute per month
Temperature influence	50 ppm/K

Internal Measured Value Storage

Memory capacity	16 MBit for approx. 300,000 measured values with indication of date and time

Power Supply

Battery	2 ea. 1.5 V mignon cell (2 ea. size AA) Alkaline manganese per IEC LR6 (2 ea. 1.2 V NiMH rechargeable battery also possible)
Operating time	With alkaline manganese batteries: Approx. 200 hours
Battery indicator	Battery capacity display with battery symbol in 4 segments: Querying of momentary battery voltage via menu function
Power OFF function	The multimeter is switched off automatically: – If battery voltage drops to below approx. 2.0 V – If none of the keys or the rotary switch are activated for an adjustable duration (10 to 59 min.) and the multimeter is not in the continuous operating mode
Power pack socket	If the power pack has been plugged into the NA X-TRA instrument, the installed batteries are disconnected automatically. Rechargeable batteries can only be recharged externally.

Display

Transreflective LCD panel (65 × 36 mm) with display of up to 3 measured values, unit of measure, type of current and various special functions

Background Illumination

Background illumination is switched off approximately 1 minute after it has been activated.

Digital

Display / char. height	7-segment characters Main display: 13 mm Auxiliary display: 7.5 mm
Number of places	309,999 steps
Overflow display	"OL" is displayed for ≥ 310,000 digits
Polarity display	"–" (minus sign) is displayed if plus pole is connected to "⊥"
Sampling rate	10 or 40 measurements per second with the Min-Max function except for the capacitance and frequency measuring functions
Refresh rate	Twice or 5 times per sec. (with or without filter)

Acoustic Signaling

For voltage	Above 600 V in the 600 V range: intermittent (250 ms on, 250 ms off)
For current	– Above 10 A: intermittent signal – Above 16 A: continuous signal – For displayed temperature > 50 °C

Fuse

Fuse link	FF (UR) 10 A/1000 V AC/DC, 10 × 38 mm, switching capacity: 30 kA at 1000 V AC/DC, protects the current measurement input in the 300 µA to 10 A ranges

Electrical Safety

Protection class	II	
Measuring category	CAT III	CAT IV
Operating voltage	600 V	300 V
Pollution degree	2	
Test voltage	5.2 kV~	

Electromagnetic Compatibility (EMC)

Interference emission	EN 61326-1, class B
Interference immunity	EN 61326-1 EN 61326-2-1

Ambient Conditions

Accuracy range	0 °C … +40 °C
Operating temperature T_A	–10 °C … +50 °C *
Storage temperature	–25 °C … +70 °C (without batteries)
Relative humidity	40 … 75%, no condensation allowed
Elevation	To 2000 m
Place of use	Indoors, except within specified ambient conditions

* Exception: current > 10 A to 16 A, operation at up to 40 °C

Mechanical Design

Housing	Impact resistant plastic (ABS)
Dimensions	200 × 87 × 45 mm (without rubber holster)
Weight	Approx. 0.4 kg with batteries
Protection	Housing: IP 52 (protection against ingress of solid foreign objects: protected against dust in harmful quantities, protection against water ingress: protection against falling dripping water, when the housing is inclined up to 15°) (pressure equalization via the housing) Sockets: IP 20 (protection against ingress of solid foreign objects: protected against solid foreign objects with diameters ≥ 12.5 mm, protection against ingress of water: protection against falling dripping water, when the housing is inclined up to 15°)

Interface Adapter for USB Connection

The following functions can be executed with the USB X-TRA bidirectional interface adapter:

- Configure the multimeter from a PC.
- Transmit live measurement data to the PC.
- Read data out of memory from the multimeter.

The adapter does not require a separate power supply.
Its baud rate is 38,400 baud.
Current drivers for Windows-based operating systems are made available via free DriverControl software, which can be downloaded from our website.

Sample Application

METRAwin 10 Software

METRAwin 10 PC software is a multilingual, measurement data logging program for recording, visualizing, evaluating and documenting measured values with reference to time from METRAHIT Advanced and Professional as well as METRAHIT A and E series multimeters.

Communications between the PC and the measuring instrument(s) is established via available interface adapters.

One or more of the following operating modes are possible, depending on device and interface type (infrared or Bluetooth):

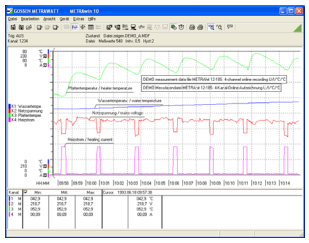
- **Device configuration**
  Remote configuration and querying of device-specific functions and parameters, for example measuring function, measuring range and memory parameters. Frequently used device settings can be saved to configuration files for easy recall.
- **Online recording of measurement data**
  Read-in, display and recording of momentarily measured data from the interconnected device.
  – Number of measuring channelsUp to 10
  – Start recording Manual, triggered by meas. value, time triggered
  – Recording mode > Time controlled with sampling interval of (0.05 s* ...) 1 s ... 60 min.
  > Manually controlled
  > Measured value controlled in the event ofexceeded limit/delta value
  – Recording duration: max. 10 million intervals

* Depending on device type, measuring function, number of measuring channels and communication mode (e.g. via modem), sampling intervals of less than 1 s cannot be used.

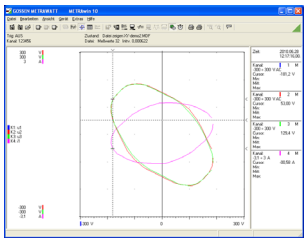
- **Reading out and visualizing stored data**
  If supported by the device: Read-in and display of offline data recorded to device memory.

For purposes of analysis, data recorded online or read in from the instrument's memory can be displayed in various formats:

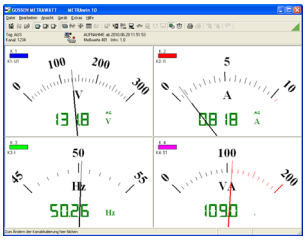
Y(t) Recorder Display for Up to 6 Channels



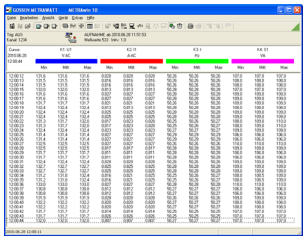
XY Recorder Display for Up to 4 Channels



Multimeter Display for Up to 4 Channels



Tabular Display for Up to 10 Channels



System Requirements

METRAwin 10 (as of version 6.20) runs on PCs, notebooks and tablets with Microsoft Windows® VISTA, 7, 8 or 10.

Order Information

Designation	Type	Article Number
TRMS Multimeter with direct, alternating and pulsating current measurement (TRMS values), direct and via current clamp transformers and sensors in consideration of transformer ratios, frequency and resistance measurement, continuity test, diode measurement, temperature measurement with type K thermocouples, triple digital display with a resolution of 310,000 digits, measuring categories: 300 V/CAT IV, 600 V/CAT III, including KS17-2 measurement cable set, two mignon batteries, condensed operating instructions, DAkkS calibration certificate	METRAHIT PM PRIME*	M248A
Same as M248A but with Bluetooth interface	METRAHIT PM PRIME BT**	M248B
Accessories for Operation at a PC		
Bidirectional interface adapter, IR-USB	USB X-TRA	Z216C
METRAwin 10 Software	METRAwin 10	GTZ3240000R0001
Accessories for Temperature Measurement with Resistance Thermometer		
Pt100 temperature sensor for surface and immersion measurement, −40 … +600 °C	Z3409	GTZ3409000R0001
Pt1000 temperature sensor for measurements in gases and liquids, −50 … +220 °C	TF220	Z102A
Pt100 oven sensor, −50 … +550 °C	TF550	GTZ3408000R0001
Replacement Fuse		
Fuses (pack of 10)	FF (UR) 10 A / 1000 V AC/DC	Z109L
Power pack	NA X-TRA	Z218G
Rubber holster and carrying strap	GH X-TRA	Z104C
2 magnetic test probes with touch protection – set with magnetic holder, 5.5 mm measuring contact diameter, insulated, CAT III 1000 V / 4 A, temperature from -10 to 60 °C, holding power under standard conditions with flat head screws: 1200 g perpendicular to the contact surface, measurement instrument connection for multimeter via angled multilam plug	Set 1 – magnetic test probes	Z502U

* Formerly METRAHIT ULTRA
** Formerly METRAHIT ULTRA BT

Transport Accessories

HitBag Cordura belt pouch

for multimeters of the METRAHIT series (with/without rubber holster)

HC30 hard case

for two multimeters (with and without rubber holster) and accessories

HitBag L Cordura belt pouch (without contents)

for METRAHIT series multimeters (with/without rubber holster) and accessories

Sample Content

F836 ever-ready case

for multimeter and accessories

Sample Content

F829 carrying pouch

for multimeters (with and without protective rubber cover) and accessories

Designation	Type	Article Number
Imitation leather carrying pouch for METRAHIT and METRAmax	F829	GTZ3301000R0003
Cordura belt pouch for METRAHIT and METRAport series multimeters	HitBag	Z115A
Large, soft belt pouch for one METRAHIT or METRAport multimeter. Made of rugged, water-repellent Cordura with 3 separate compartments for measurement cables, clips, instructions, CD etc.	HitBag L	Z115B
Imitation leather ever-ready case with cable compartment	F836	GTZ3302000R0001
Ever-ready case for 2 METRAHITs, 2 adapters and accessories	F840	GTZ3302001R0001
Hard case for one METRAHIT and accessories	HC20	Z113A
Hard case for two METRAHITs and accessories	HC30	Z113A

Further information regarding accessories can be found:

- In our Measuring Instruments and Testers catalog
- On the Internet at www.gossenmetrawatt.com

Current Measuring Accessories

All current sensors and transformers are equipped with connection via 4 mm safety banana plugs.

Type	Designation	Measuring Range	Meas. Category	Max. Conductor Dia.	Transmission Factor	Frequency Range	Intrinsic Uncertainty ±(|% rdg.| + …)	Article Number
DC/AC Current Sensors with Voltage Output								
CP30	DC/AC current clamp sensor with battery mode (30 h)	5 … 30 A (DC / AC pk)	300 V / CAT III	25 mm	100 mV/A	DC…20 kHz (-3 dB)	|1%| + 2 mA	Z201B
CP330	DC/AC current clamp sensor with 2 measuring ranges, battery mode (50 h)	0.5 … 30 A 5 … 300 A (DC / AC RMS)	300 V / CAT III	25 mm	10 mV/A, 1 mV/A	DC…20 kHz (-3 dB)	|1%| + 50 mA |1%| + 100 mA	Z202B
CP1100	DC/AC current clamp sensor with 2 measuring ranges, battery mode (50 h)	0.5 … 100 A 5 … 1000 A (DC / AC RMS)	300 V / CAT III	32 mm	10 mV/A, 1 mV/A	DC…20 kHz (-1 dB)	|1%| + 100 mA |1%| + 500 mA	Z203B
CP1800	DC/AC current clamp sensor with 2 measuring ranges, battery mode (50 h)	0.5 … 125 A 5 … 1250 A (DC / AC RMS)	300 V / CAT III	32 mm	10 mV/A, 1 mV/A	DC…20 kHz (-1 dB)	|1%| + 100 mA |1%| + 500 mA	Z204A
AC Current Sensors with Voltage Output								
WZ12B	AC current sensor clamp	10 mA~ … 100 A~	300 V CAT III	15 mm	100 mV/A	45 to 65 … 500 Hz	|1.5%| + 0.1 mA	Z219B
WZ12C	AC current sensor clamp with 2 measuring ranges	1 mA~ … 15 A~, 1 … 150 A~	300 V CAT III	15 mm	1 mV/mA, 1 mV/A	45 to 65 … 400 Hz	|3%| + 0.15 mA, |2%| + 0.1 A	Z219C
WZ11B	AC current sensor clamp with 2 measuring ranges	0.5 … 20 A~, 5 … 200 A~	600 V CAT III	20 mm	100 mV/A, 10 mV/A	30…48…65 … 500 Hz	|1 … 3%|	Z208B
Z3512A	AC current sensor clamp with 4 measuring ranges	1 mA … 1/10/100/1000 A~	600 V CAT III	52 mm	1 V/A, 100 mV/A, 10 mV/A; 1 mV/A	10…48…65 … 3 kHz	|0.5 … 3%|, |0.2 … 1%|	Z225A
METRAFLEX3000	Flexible AC current sensor with 3 measuring ranges, battery mode (2000 h)	0.5 … 30 A, 0.5 … 300 A, 5 … 3000 A	1000 V CAT III 600 V CAT IV	176 mm	100 mV/A, 10 mV/A, 1 mV/A	10 Hz … 20 kHz	|1%| + 0.1 A |1%| + 0.1 A |1%| + 1 A	Z207E
METRAFLEX300M	Flexible, miniature AC current sensor with 3 measuring ranges, battery mode (150 h)	1 … 3 A, 1 … 30 A, 5 … 300 A	1000 V CAT III 600 V CAT IV	50 mm	1 V/A, 100 mV/A, 10 mV/A	10 Hz … 100 kHz	|1%| + 0.2 A |1%| + 0.2 A |1%| + 1 A	Z207M
AC Current Transformers with Current Output								
WZ12A	AC current transformer clamp	15 … 180 A~	300 V CAT III	15 mm	1 mA/A	45 to 65 … 400 Hz	|3%|	Z219A
WZ12D	AC current transformer clamp	30 mA … 150 A~	300 V CAT III	15 mm	1 mA/A	45 to 65 … 500 Hz	|2.5%| + 0.1 mA	Z219D
WZ11A	AC current transformer clamp	1 … 200 A~	600 V CAT III	20 mm	1 mA/A	48 to 65 … 400 Hz	|1% … 3%|	Z208A
Z3511	AC current transformer clamp	4 … 500 A~	600 V CAT III	30 × 63 mm	1 mA/A	48 to 65 … 1 kHz	|3%| + 0.4 A	GTZ3511000R0001
Z3512	AC current transformer clamp	0.5 … 1000 A~	600 V CAT III	52 mm	1 mA/A	30…48…65 … 5 kHz	|0.5% … 0.7%|	GTZ3512000R0001
Z3514	AC current transformer clamp	1 … 2000 A~	600 V CAT III	64 × 150 mm	1 mA/A	30…48…65 … 5 kHz	|0.5%| + 0.1 A	GTZ3514000R0001

GOSSEN METRAWATT

Gossen Metrawatt GmbH
Südwestpark 15
90449 Nürnberg • Germany

Phone +49 911 8602-0
Fax +49 911 8602-669
e-mail info@gossenmetrawatt.com
www.gossenmetrawatt.com