

Digital-Multimeter

UNIGOR® 380, UNIGOR® 390

- Precision multimeters (V, dB, A, Ω , F, Hz, °C)
- UNIGOR® 390: Power meter W, Var, VA, Wh, $\cos \phi$, 128 kB data memory
- Optimum measurement information due to triple display (3*310000 digit)
- Calibration certificate provided
- Windows® software option for measurement data processing via RS232 interface
- Conforms to the highest safety standard IEC / EN 61010-1, Second Edition

General

Applications

UNIGOR® 380 and UNIGOR® 390 multimeters are high performance precision instruments for the lab, service and training. With a display range of 310,000 digits as well high level accuracy and longterm stability, they fulfill all calibration and R&D laboratory demands. Battery operation allows for on-site precision servicing and calibration.

Description

Convenient Triple Display

The current measurement value, as well as two other values, are updated and displayed, e.g. minimum and maximum value. The usual switching back and forth between display values is no longer necessary. Display resolution for the main display value can be varied from 4 $\frac{3}{4}$ digits for AC to 5 $\frac{3}{4}$ digits for DC (UNIGOR® 390: from 2 $\frac{3}{4}$ to 5 $\frac{3}{4}$ digits). The measurement rate, adjustable from 0.5 ms to 10 s, allows for high-speed recorder, precision data logger and mean value recorder functions with the help of UNIGOR® Win 300 (PC software).

High Resolution and Precision

5 $\frac{3}{4}$ digits, or 309,999 digits, allow for cost effective calibration and precise reference measurements.

Effective Value for Distorted Waveforms

The implemented measurement process provides for effective value measurement (TRMS) independent of the waveform up to 100 kHz.

AUTO SELECT

Provides for automatic selection of the measurement function (V, Ω and F), as well as automatic setting of the measuring range.



Additional Functions

Continuity testing with audible signal, event counting, event duration measurement, overall time, stopwatch, data compare and wide-range capacitance measurement. The integrated temperature measurement function allows the connection of thermocouples and platinum resistance thermometers.

Overload Protection

The instrument is protected from overload in the voltage range. Acoustic signalling occurs if measuring range limits are exceeded. The FUSE display indicates a defective fuse in the current range.

Calibration

UNIGOR® 380 and UNIGOR® 390 multimeters are shipped with a calibration certificate. They can be automatically calibrated with a calibration system via the RS232 data interface.

Power Pack and Sensor Connection

The connector terminal for power supply via mains power pack can be used alternately for multimeter power supply or for the output of pressure sensor auxiliary power (accessory for UNIGOR® 390).

Automatic Blocking System (ABS)

Automatic Blocking of connector Sockets prevents incorrect connection of measurement cables, and selection of incorrect measurement magnitudes. Thus hazards for the operator, the instrument and the system are substantially reduced, and in many cases entirely eliminated.

Autom. Measurement Value Storage













The DATA HOLD function allows for storage of the digitally displayed measurement value. A patented process assures that the actual measurement values are stored when rapid measurement magnitude changes occur. The stored measurement value appears at the digital display.

Infrared Measurement Data Transmission

These devices include a serial, duplex data interface for remote control and measurement value transmission via infrared light.

LEM

UNIGOR® 380 and UNIGOR® 390 Characteristic Values




Meas. Function	Measuring Range	Resolution at Measuring Range Upper Limit				Input Impedance		Inherent Deviation at highest Resolution under reference conditions ²⁾		Overload Capacity ⁵⁾		Meas. Function
		300 000 ¹⁾	30 000 ¹⁾	3 000 ¹⁾	300 ¹⁾	—		—	 ⁶⁾	Overload Value	Overload Duration	
V ²⁾	300 mV ³⁾	1 µV	10 µV	100 µV	1 mV	>20 MΩ	5 MΩ//<50 pF	0.02+0.005+5 ⁸⁾	0.5 + 30	1050 V DC AC eff sine	contin.	V
	3 V ³⁾	10 µV	100 µV	1 mV	10 mV	11 MΩ	5 MΩ//<50 pF	0.02 + 0.005 + 5	0.2 + 30			
	30 V	100 µV	1 mV	10 mV	100 mV	10 MΩ	5 MΩ//<50 pF	0.02 + 0.005 + 5	0.2 + 30			
	300 V	1 mV	10 mV	100 mV	1 V	10 MΩ	5 MΩ//<50 pF	0.02 + 0.005 + 5	0.2 + 30			
	1000 V	10 mV	100 mV	1 V	10 V	10 MΩ	5 MΩ//<50 pF	0.02 + 0.005 + 5	0.2 + 30			
dB	see table below					—	same as V 	—	± 0.1 dB ¹²⁾			dB
						Voltage drop approx.						
						—		—	 ⁶⁾			
A ²⁾	300 µA	1 nA	10 nA	100 nA	1 µA	160 mV	160 mV	0.05 + 0.02 + 5	0.5 + 30	0.36 A	contin.	A
	3 mA	10 nA	100 nA	1 µA	10 µA	160 mV	160 mV	0.05 + 0.01 + 5	0.5 + 30			
	20 mA	100 nA	1 µA	10 µA	100 µA	200 mV	200 mV	0.02 + 0.01 + 5	0.5 + 30			
	30 mA							0.05 + 0.01 + 5				
	300 mA	1 µA	10 µA	100 µA	1 mA	300 mV	300 mV	0.1 + 0.01 + 5	0.5 + 30			
	3 A		100 µA	1 mA	10 mA	110 mV	110 mV	0.2 + 0.05 + 5	0.5 + 30	10A ⁷⁾	contin.	
	10 A		1 mA	10 mA	100 mA	350 mV	350 mV	0.2 + 0.05 + 5	0.5 + 30			
Ω						open circuit voltage	short-cut current	±(...% of rdg.+...% of r.+...d)		500 V DC AC eff Sinus	10 min	Ω
	300 Ω	1 mΩ				0.6 V	max. 250 µA	0.05 + 0.01 + 5 ⁸⁾				
	3 kΩ	10 mΩ				0.6 V	max. 45 µA	0.05 + 0.01 + 5 ⁸⁾				
	30 kΩ	100mΩ				0.6 V	max. 4.5 µA	0.05 + 0.01 + 5				
	300 kΩ	1 Ω				0.6 V	max. 1.5 µA	0.05 + 0.02 + 5				
	3 MΩ	10 Ω				0.6 V	max. 150 nA	0.1 + 0.02 + 5				
	30 MΩ	100 Ω				0.6 V	max. 15 nA	1 + 0.2 + 5				
Ω 	300 Ω			0,1 Ω		max.3 V	max. 1.4 mA	0.2 + 0 + 3				Ω 
	300 mV			100 µV		max. 0.6V	max. 0.3 mA	0.2 + 0 + 3				
	3 V-		100 µV			max. 3 V	max. 1.4 mA	0.2 + 0 + 3				
F						Discharge Resist.	U _{0max}	± (...% of rdg. + ... % of r.)		500 V DC AC eff sine	10 min	F
	3 nF			1 pF		10 MΩ	3 V	1.0 + 0.2 ⁸⁾				
	30 nF			10 pF		10 MΩ	3 V	1.0 + 0.2				
	300 nF			100 pF		1 MΩ	3 V	1.0 + 0.2				
	3 µF			1 nF		100 kΩ	3 V	1.0 + 0.2				
	30 µF			10 nF		11 kΩ	3 V	1.0 + 0.2				
	300 µF			100 nF		2 kΩ	3 V	5.0 + 1				
	3 mF			1 µF		2 kΩ	3 V	5.0 + 1				
	30 mF			1 µF		2 kΩ	3 V	5.0 + 1				
						f min ⁴⁾		± (...% of rdg. ...Hz)				
Hz	300.00 Hz	0,001Hz				1 Hz		0.05 + 1 ⁹⁾		1000 V	contin.	Hz
	3.0000 kHz	0,01 Hz				1 Hz		0.05 + 1 ⁹⁾		1000 V		
	30.000 kHz	1 Hz				1 Hz		0.05 + 1 ⁹⁾		300 VDC 30 VAC		
	100 min ³⁾		10 ms					± 15 d				
								± (...% of rdg. + ... d)				
°C	Pt 100	-200,0 ... 100,0 °C		0,1 °C				0.5 K + 3 ¹⁰⁾		500 V DC eff sine	10 min	°C
		100,0 ... +850,0 °C		0,1 °C				0.2 K + 3 ¹⁰⁾				
	Pt 1000	-270,0... +850 °C		0,1 °C				0.5 K + 3 ¹⁰⁾		1050 V DC eff		
	K	-200,0... +1372,0 °C		0,1 °C				0.7 + 3 ^{10, 11)}				
	Ni-Cr-Ni							0.8 + 3 ^{10, 11)}				
J Fe-CuNi	-210,0... +1200 °C		0,1 °C									

dB-Ranges

Measuring Range	Display range at Ref. voltage U = 0,775V	Resolution
300 mV~	-48 dB ... -8 dB	0.01dB
3 V~	-38 dB ... +12 dB	0.01dB
30 V~	-18 dB ... +32 dB	0.01dB
300 V~	+2 dB ... +52 dB	0.01dB
1000 V~	+22 dB ... +63 dB	0.01dB
	Display (dB) = 20 lg U _x (V) / U _{ref}	

Key rdg. = Measurement value
 r. = measuring range
 d. = digit

- 1) **UNIGOR® 380:** 5 ¼ places for DC, and 4 ¼ places for AC, **UNIGOR® 390:** 2 ¼ to 5 ¼ places
- 2) Sampling rate depends upon resolution: 0.5 s/50 ms/5 ms/1 ms (without filter); filter ON: -3 dB @ 3 Hz
- 3) Stopwatch; format: mm:ss:hh where m=minute, s = second and h = 1/100 s, max.: 99:59:59
- 4) lowest measurable frequency with sinusoidal measurement signal symmetric to zero point at 0 ° ...+40 °C
- 5) Values <300 digits are suppressed, 16 ... 45 ... 65 Hz ... 100 kHz sine. See next page for influences.
- 6) Values <300 digits are suppressed, 16 ... 45 ... 65 Hz ... 100 kHz sine. See next page for influences.

- 7) 12 A – 5 min, 16 A – 30 s
- 8) When "Zero Balancing" function is active (ZERO display)
- 9) Range
3 V : UE = 0.3 V eff/rms...3 V eff/rms
30 V : UE = 3 V eff/rms...30 V eff/rms
300 V : UE = 30 V eff/rms...300 V eff/rms
- 10) Plus sensor deviation
- 11) Without integrated reference junction; inherent deviation: +10 d for T < 0 °C or +5 d for T > 0 °C
- 12) for U>10 % of the measuring range

Additional Functions of UNIGOR® 390

Power Measurement

The **UNIGOR® 390** is a compact high performance measurement instrument for direct and alternating current for single and three-phase systems. The current path can be connected directly, or with a clip-on current transformer.

Universal power measurement is possible for the following measuring functions:

Active, reactive, and apparent power, power factor and energy.

Memory Mode

The instrument includes a measurement value memory (128 kB, 13,000 to 60,000 values) and a quartz clock. Data can be stored to memory, or transmitted to the PC. Data are acquired by the system in real-time (data logger).

Technical Characteristics UNIGOR® 390 – Power, Energy

Meas. function	Measuring range	Selector switch		Res. at meas. range upper limit	Overload Capacity ¹⁾	
		mA	A		Overload Value	Overload Duration
W	1 mW	•		0.1 µW	V: 1090 V	
	10 mW	•		1 µW	mA: 0,36A	V/mA:
	100 mW	•		10 µW	A: 10 A	continuous
	1 W	•		0.1 mW		
	10 W	•	•	1 mW	DC	A
	100 W	•	•	10 mW	AC	5 min
	1 kW	•	•	0.1 W	eff	
	10 kW	•	•	1 W	sine	

1) For 0°C ... +40°C

2) 0.1 ... 1x measuring range, 16 ... 45 ... 65 Hz ... 100 kHz sine. Influences see below

Influence Variables and Errors

Influence Variable	Influence Range	Measuring function Measuring Range ¹⁾	Influence effect ppm/K
Temperature	0 °C ... +21 °C and +25 °C ... +40 °C	V _~	30
		V _~	50
		300 µA...30mA + ~	180
		300 mA + ~	290
		3A/10A + ~	200
		300 Ω ... 300 kΩ	100
		3 MΩ	200
		30 MΩ	1000
		3 nF ... 30 µF	500
		Hz	50
		°C	100

Influence Variable	Influence Range (max. resolution)	Frequency	Inherent Deviation ³⁾ ±...% of rdg.
Frequency V _{AC}	300,000 mV	>15 Hz ... 45 Hz	2 + 10 d
		>65 Hz ... 1 kHz	0.5
		>1 kHz ... 20 kHz	1.5
		>20 kHz ... 50 kHz	2
		>50 kHz ... 100 kHz	5
	3.00000 V 30.000 V 300.000 V	>15 Hz ... 45 Hz	2 + 10 d
		>65 Hz ... 1 kHz	0.5
		>1 kHz ... 20 kHz	1.5
		>20 kHz ... 50 kHz	2
		>50 kHz ... 100 kHz	2
	1000,00 V	>15 Hz ... 45 Hz	2 + 10 d
		>65 Hz ... 1 kHz	1
		>1 kHz ... 20 kHz	10

Influence Variable	Influence Range (max. resolution)	Frequency	Inherent Deviation ±...% of rdg. +...d
Frequency I _{AC}	300.00 µA 3.0000 mA 30.000 mA 3.0000 A 10.000 A	>15 Hz ... 45 Hz	2 + 10
		>65 Hz ... 200 Hz	0.75 + 5
		>200 Hz ... 5 kHz	0.75 + 5
		>5 kHz ... 20 kHz	5 + 5

Line Fault Analysis

The power meter continuously monitors mains voltage and line faults.

Fault type	Meas. Function/ Meas. Range	Resolution	Intrinsic Error of Highest Resolution under Reference Conditions	Pulse Duration
Dropout*	300 V	4 V	5 % of rdg. +5% range	Sampling rate 2 ms
	1000 V	40 V	10 % of rdg. +10% range	
Pulse	200...1000 V	10 V	50 V	0.5...5 µs

*Settings via drop out trigger

Intrinsic Error, Frequency Influence for Power and Energy

Measuring Magnitude	Measuring Range	Intrinsic Error (...% of rdg. +...d)		
		15 Hz...45 Hz	45 Hz...65 Hz	65 Hz...1 kHz
Active Power	300 mA/3 A/10 A	1.2 + 20	1 + 20	3 + 20
	100 mA... 10 mA	1.3 + 20	1 + 20	3 + 20
	1 A	1.3 + 20	1 + 20	3 + 20
Reactive Power		2.5 + 20	1.5 + 20	3 + 20
Apparent Power		1.2 + 20	1 + 20	1.2 + 20
Power factor		2 + 2	1 + 2	2 + 2
¼ hr. Power		1.2 + 20	1 + 20	1.3 + 20
Energy		1.2 + 2	1 + 2	1.3 + 2
Voltage		0.4 + 30	0.3 + 30	0.4 + 30
Current		0.7 + 30	0.6 + 30	0.9 + 30

Influence Variable	Influence Range	Measuring Function ¹⁾	Influence effect ²⁾										
Measurement Magnitude Waveform	Crest- 1 ... 3	V~, A~	± 1 % rdg.										
	factor CF >3 ... 5		± 3 % rdg.										
	The allowable crest factor, CF, for the alternating magnitude to be measured is dependent upon the displayed value:												
	Voltage and Current Measurement												
<table border="1"><caption>Data points for CF vs Digit</caption><thead><tr><th>Digit</th><th>CF</th></tr></thead><tbody><tr><td>0</td><td>5</td></tr><tr><td>10000</td><td>5</td></tr><tr><td>20000</td><td>3</td></tr><tr><td>30000</td><td>2</td></tr></tbody></table>				Digit	CF	0	5	10000	5	20000	3	30000	2
Digit	CF												
0	5												
10000	5												
20000	3												
30000	2												

Influence Variable	Influence Range	Measuring Function ¹⁾	Influence error
Relative humidity	75 % 3 days Instrument off	V, A, Ω F, Hz °C	1 x intrinsic error

Influence Variable	Influence Range	Measuring Range	Damping ± dB
Common Mode Interference Voltage	influence parameter max 1000 V ~	V...	> 90 dB
		300 mV ... 30 V ~	>80 dB
	influence parameter max 1000 V ~ 50 Hz, 60 Hz Sinus	300 V ~	>70 dB
		1000 V ~	>60 dB
Series Mode Interference Voltage	Interference magnitude V ~ per nominal measuring range value, max. 1000 V ~, 50 Hz, 60 Hz Sinus	V...	>60 dB
	influence parameter max 1000 V -	V ~	> 60 dB

1) With zero balancing

2) Except for sinusoidal waveforms

3) Indicated error applies values > 10 % of measuring range

Reference Conditions

Ambient Temperature	+23 °C ± 2 K
Relative Humidity	45 ... 55 %
Meas. Magnitude Frequency	45 ... 65 Hz
Meas. Magnitude Waveform	sine
Battery Voltage	3 V ± 0.5 V
Power Pack Voltage	4.2 V ± 0.2 V

Applicable Regulations and Standards

IEC 61010-1: 2nd Edition	Safety regulations for electrical measurement, control, regulating and laboratory devices
DIN EN 61010 part 1	
VDE 0411-1	Digital measuring instruments
DIN 43751	Generic standard for interference emission;
DIN EN 50081 part 1	residential, business and light industry
DIN 50082 part 1	Generic standard for interference immunity; residential, business and light industry
VDI/DE 3540	Reliability of measurement, control and regulating devices
DIN EN 60529	Test instruments and procedures
DIN VDE 0470 part 1	– level of protection provided by enclosures (IP code)

Response time

Response Time (after manual range selection)

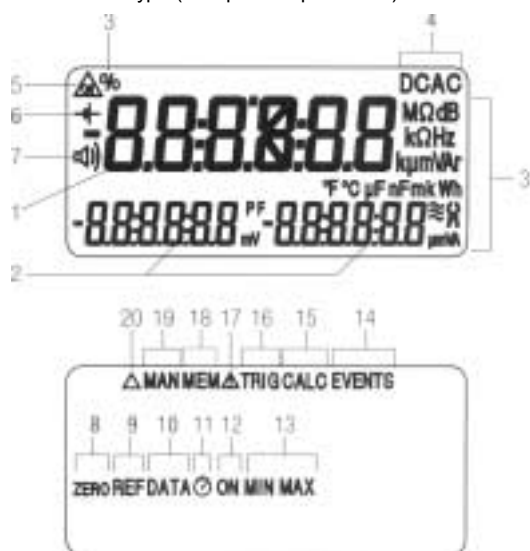
Measuring Magnitude/ Measuring Range	Digital Display Response Time	Measuring Magnitude Step Function
V _~ , V _~ A _~ , A _~	1.5 s	from 0 to 80 % of meas. range upper limit
300 Ω ... 3 MΩ	2 s	from ∞ to 50 % of measuring range upper limit
30 MΩ	5 s	
Continuity	<50 ms	
	1.5 s	
3 nF ... 300 μF	max. 2 s	from 0 to 50 % of measuring range upper limit
3 000 μF	max. 7 s	
10 000 μF	max. 14 s	
>10 Hz	max. 1.5 s	
°C	max. 3 s	

Display

LCD field (65 mm x 30 mm) with display of max. 3 measurement values, unit, current type and various special functions.

Display /

Character Height	7 segment characters
main display:	12 mm
auxiliary displays:	7 mm
Number of Places	5½ places, 309999 steps
Overflow Display	"OL" appears in display
Polarity Display	"—" sign is displayed when plus pole is connected to "—" jack
Defective Fuse	"FUSE" appears in display
Display Refresh	0.5/s ... 2/s depending upon measurement type (except for capacitance)



UNIGOR® 380 and 390 display

Digital Display Symbols

- 1 Main display with decimal point and polarity
- 2 Auxiliary displays with decimal point and polarity
- 3 Unit of measuring function
- 4 Selected function
- 5 Continuous operation, symbol blinks for data transmission
- 6 Low battery
- 7 Acoustic signal on, buzzer sounds for corresponding function
- 8 Zero balancing
- 9 Reference value
- 10 Display memory, "save measurement value"
- 11 Stopwatch on, or elapsed time since start of measurement
- 12 Together with symbol 11:
Elapsed time since activation of corresponding function,
counter, number of events if trigger threshold is exceeded
- 13 MIN/MAX storage
- 14 Event duration
- 15 No function
- 16 Synchronized storage, **UNIGOR® 390** only
- 17 No function
- 18 Memory mode, **UNIGOR® 390** only
- 19 Manual measuring range selection
- 20 Relative value

Power Supply

Battery	2 ea. 1.5 V mignon cell zinc carbon battery per IEC R6 alkali manganese cell per IEC LR6
Service Life	with zinc carbon battery: approx. 50 hr. with alkali manganese cell: prox. 100 hr.
Battery Test	automatic display of "— —", symbol when battery voltage drops below approx. 2.3 V

Economy Circuit

The instrument is switched off automatically, if the measurement value remains unchanged for about 10 minutes, and no activation of operating elements occurs during this time. This function can be deactivated.

Fusing

Fuse for ranges up to 300 mA	FF 1.6 / 500 G; 6.3 mm x 32 mm; 20 kA switching capacity at 500 V with resistive load; protects all current measuring ranges up to 300 mA in combination with power diodes
up to 10 A	16 A / 600 V; 10 mm x 38 mm; 100 kA switching capacity at 600 V with resistive load; protects 3 A and 10 A ranges at up to 600 V

Electrical Safety

Protection Class	II per IEC 61010-1: 2 nd Edition / EN 61010-1 / VDE 0411-1	
Overvoltage Category	III	IV
Operating Voltage	600 V	300 V
Pollution degree	2	2
Test Voltage	5.55 kV~ per IEC 61010-1/EN 61010-1/ VDE 0411-1	

Electromagnetic Compatibility, EMC

Interference Emission	EN 50081-1:1992 / EN 55022:1987 Class B
Interference Immunity	EN 50082-1:1992 / / IEC 801-2:1991 8 kV atmospheric discharge / / IEC 801-3:1984 3 V/m / / IEC 801-4:1988 0.5 kV

Data Interface

Data Transmission	Optical transmission through housing with infrared light
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With accessory interface adapter

Type	RS232C, serial, per DIN 19241
Baud Rate	UNIGOR® mem 232: 8192 Baud, UNIGOR® link 232: 9600 Baud

Ambient Conditions

Operating Temp. Range	-20 °C ... + 50 °C
Storage Temp. Range	-25 °C ... + 70 °C (without batteries)
Relative Humidity	max. 75%, without condensation
Climatic Category	2z/-20/50/70/75%
Elevation	in compliance with VDI/VDE 3540 to 2000 m

Mechanical Design

Protection	Devices: IP 50 Connector jacks: IP 20
Dimensions	84 mm x 195 mm x 35 mm
Weight	UNIGOR® 380: approximately 350 g with batteries UNIGOR® 390: approximately 405 g with batteries

Included Equipment

- 1 Multimeter
- 1 Protective case for operation under adverse conditions. A cover made of pliable rubber including support bar protects the device from damage due to impacts and falls. The rubber material assures a safe stand for the instrument even on vibrating surfaces.
- 1 Cable set
- 2 Batteries (inserted)
- 1 Operating Instructions
- 1 Calibration certificate

Warranty

- 3 years material and workmanship
- 1 year for calibration



A 6001 10330
Carrying case

Adapter for the connection of the multimeter to a PC

Whereas the **UNIGOR® 380** can be expanded with the UNIGOR® mem 232 memory adapter for memory mode operation and connection to the PC, the **UNIGOR® 390** includes an integrated memory and only requires an interface adapter for PC connection. Both devices can be connected to the PC with either UNIGOR® mem 232 or UNIGOR® link 232 adapters.

UNIGOR® mem 232 Memory Adapter

The UNIGOR® mem 232 memory adapter, which can be plugged on to hand-held UNIGOR® multimeters, provides for direct transmission of measurement data from a UNIGOR® to the PC, as well as on-site measurement data storage without PC, and subsequent uploading to the PC. Data are synchronized with an integrated clock. Memory: 128 kB (equal to about 100,000 measurement values)

Sampling

With a selected sampling rate of max. 0.05 s, an arithmetic mean value is ascertained for measurement values which are transmitted at a clock pulse of 50 ms. Within a range of 1 s to 60 s, the signal sampling duration remains at a constant 0.5 s (10 measurement values). Thanks to the integrated stand-by circuit, the memory module enters the "dormant mode" for the remaining duration of the sampling cycle after acquirement has occurred, and thus spares the battery. Signal acquirement is thus interrupted during the rest cycle. The functional principal is the same as for a dot matrix printer. Sampling is based on the selected signal hysteresis, and is signal-dependent.

This sampling method results in a virtual memory expansion, which is independent of measurement signal dynamics and selected signal hysteresis.

This allows for a manifold expansion of memory capacity (10-...100-fold).

Adjustable Sampling Rate	50 ms ... 1 min
Sampling Period	Operating Life (battery service life)
0.05 ... 0.5 s	> 30 days
10 s	9 months
20 s	12 months
60 s	18 months

Trigger (on-line)

The on-line trigger functions are quite varied and enable effective data reduction. They are triggered when lower or upper limit threshold values are exceeded.

The following functions are available for data reduction:

- Trigger when lower/upper threshold limits are exceeded
- Trigger within lower/upper threshold limits
- Store when lower/upper threshold limits are exceeded
- Store within lower/upper threshold limits

The trigger function can also be triggered by date and time. An "automatic restart" function allows for the storage of up to 1000 trigger data files to the PC hard disc.

Multiple Measurement System Set-Up (on-line and off-line)

Up to 6 UNIGOR® mem 232 adapters can be interconnected for the set-up of an on-line, high performance multiple measuring system, which are connected to a PC with a standard interface cable (RS232C), or up to ten adapters for off-line operation. Each adapter can be manually equipped with a specific destination address.

UNIGOR® link 232 Interface Adapter

With the help of the UNIGOR® link 232 bidirectional adapter, **UNIGOR® 380** and **UNIGOR® 390** multimeters can be adjusted and their para-meters can be set, and measurement data can be transmitted to the PC. This adapter includes no memory.

Interface Packs

An interface pack is capable of connecting one or more UNIGOR® multimeters to a PC. It includes all hardware and software required for the set-up of a PC measuring system.

Single Channel Pack UNIGOR® Set 301 L

- 1 UNIGOR® link 232 Interface Adapter
- 1 RS232 bus cable, 2 m long
- 1 UNIGOR® Win 300 PC software
- 1 installation instructions

Single Channel Memory Pack UNIGOR® Set 301

- 1 UNIGOR® mem 232 Interface Adapter + memory
- 1 RS232 bus cable, 2 m long
- 1 UNIGOR® Win 300 PC software
- 1 installation instructions

Four Channel Memory Pack UNIGOR® Set 304

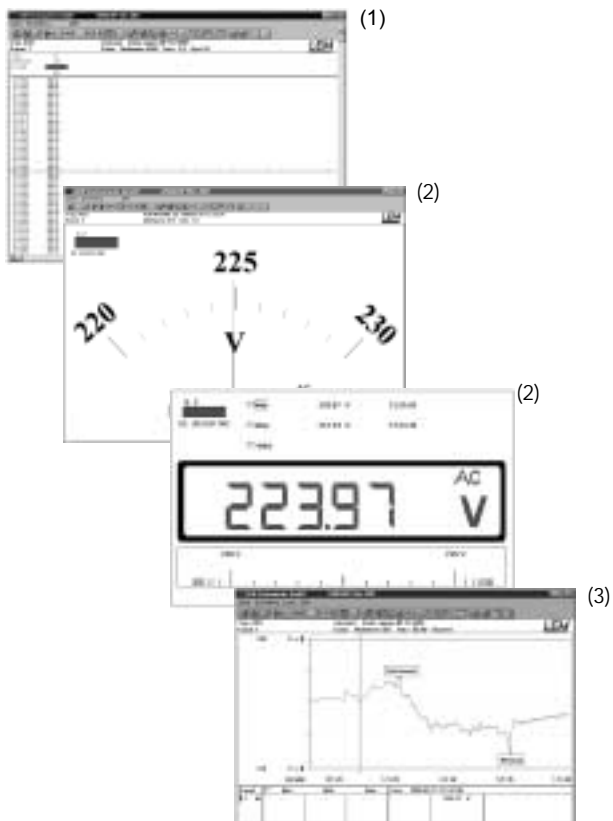
- 4 UNIGOR® mem 232 Interface Adapters + memory
- 1 RS232 bus cable, 2 m long
- 1 UNIGOR® Win 300 PC software
- 1 installation instructions



4 UNIGOR® digital multimeters, connected to one another via UNIGOR® mem 232 memory adapters, result in a multiple measuring system in combination with a PC and UNIGOR® Win 300 software. The measurement values are electrically isolated with the fully enclosed UNIGOR® housing, and are transmitted via infrared light to the UNIGOR® link 232 interface adapter or UNIGOR® mem 232 memory adapter. Connection to the PC is made with a serial interface cable.

UNIGOR® Win 300

UNIGOR® Win 300 software (operative under WINDOWS® 3.11 or higher) provides for the processing and representation of measurement data at the PC. Sampling in the on-line mode can be accomplished manually with the adjustable sampling interval, or signal dependent (with adjustable signal hysteresis). Storage in ASCII format is controlled with two trigger thresholds per channel, as well as via system time.



Data Logger (1)

Acquired measurement data from as many as 10 channels are numerically represented at the monitor in concise tabular form.

Multimeter (2)

Transmitted measurement data from a maximum of 4 freely selectable channels are represented at the monitor in the on-line mode in digital or analog form.

Y(t) Recorder (3)

Acquired measurement data from up to 4 freely selectable channels are represented at the monitor as a line graph with horizontal time axis, and are delineated with pointers. Stored signals can be expanded (zoom) or compressed, relative to amplitude as well as time axis. The time scale can be represented in absolute time, or relative to measuring time.

XY Recorder

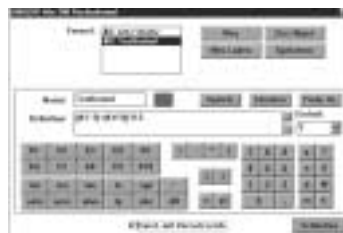
Acquired measurement data from two to four freely selectable channels are represented at the monitor as an XY graph, and are delineated with the cursor. As is the case in all display formats, all scales are freely adjustable.

Sampling (on-line)

On-line sampling is accomplished manually (mouse click), automatically with an adjustable interval (50 ms ... 60 min) or signaldependent with adjustable signal hysteresis (0 ... 500 digits). Data can be controlled with timing or trigger windows, and automatically stored as multiple data files.

Measurement Data Processing

Measurement data can be analyzed, linked and represented, on or off-line, by means of high performance computing functions.

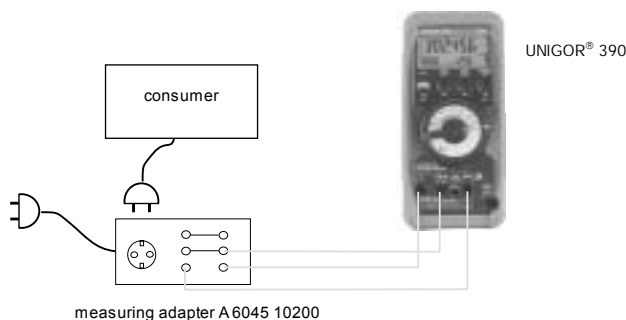


Further processing of measurement data is also possible with linearisation functions. mA signals from sensors can thus, for example, be directly represented as pressure values, apparent power etc.

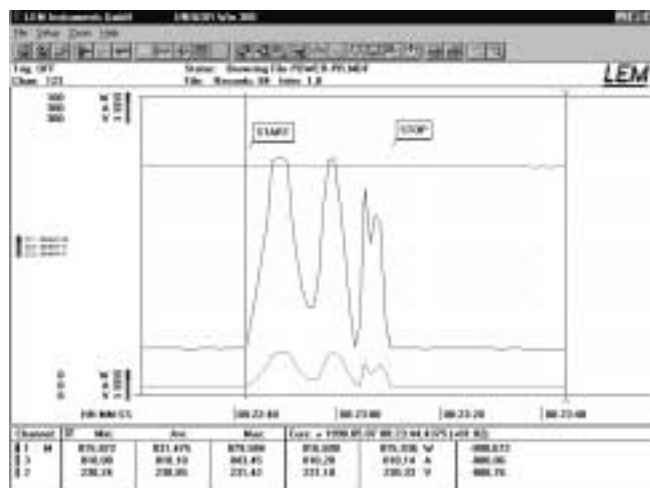
UNIGOR® mem 232 Memory Adapter Parameters

Memory adapter parameters can be set manually with the keys at the front panel, or via the PC serial interface. If synchronized with the PC clock function, up to ten memory adapters can be used for synchronous data logging. Values for minimum and maximum value triggering, recording time and re-trigger time can be easily adjusted. Start of measurement is also controlled with the quartz movement integrated into the memory adapter, as well as sampling rate and signal hysteresis.

Application power measurement



Evaluation of UNIGOR® Win 300



Scope of Delivery, Accessories

Digital Multimeter

UNIGOR® 380	Precision-Digital-Multimeter including cable set, battery, protective holster, calibration certificate and operating instructions	A 1837 38011
UNIGOR® 390	Precision-Digital-Multimeter including cable set, battery, protective holster, calibration certificate and operating instructions	A 1837 39011

Accessories

PS750	Mains adapter 230 V AC	A 6403 30011
UNIGOR® Set 301L	Single channel pack including interface adapter UNIGOR® link 232 (without memory), PC-cable and UNIGOR® Win 300 software	A6412 30110
UNIGOR® Set 301	Single channel memory pack including memory adapter UNIGOR® mem 232, PC-cable and UNIGOR® Win 300 software	A 6412 30111
UNIGOR® Set 304	Four channel memory pack including 4 memory adapters UNIGOR® mem 232, PC-cable and UNIGOR® Win 300 software	A 6412 30411
UNIGOR® mem 232	Memory adapter for UNIGOR® 380	A 6412 32000

LEM have a wide range of current probes available for use with multimeters, for more information contact your local representative or visit www.lem.com.



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