

PeakTech[®]

Prüf- und Messtechnik

 **Spitzentechnologie, die überzeugt**



PeakTech[®] 4000

**Bedienungsanleitung/
Operation manual**

Digital-Multimeter

1. Safety Precautions

This product complies with the requirements of the following European Community Directives: 2004/108/EC (Electromagnetic Compatibility) and 2006/95/EC (Low Voltage) as amended by 200/22/EC (CE-Marking). Overvoltage category II 1000V; overvoltage category III 600V; pollution degree 2.

- CAT I: For signal level, telecommunication, electronic with small transient over voltage
CAT II: For local level, appliances, main wall outlets, portable equipment
CAT III: Supplied from a cable under earth; fixed installed switches, automatic cut-off or main plugs.
CAT IV: Units and installations, which are supplied over aerial line, which are stand in a risk of persuade of a lightning, i.e. main-switches on current input, overvoltage-diverter, current use counter.

Warning! Do not use this instrument for high-energy industrial installation measurement. To ensure safe operation of the equipment and eliminate the danger of serious injury due to short-circuits (arcing), the following safety precautions must be observed.

The meter is designed to withstand the stated max voltages. If it is not possible to exclude without doubts that impulses, transients, disturbance or for other reasons, these voltages are exceeded a suitable prescale (10:1) must be used.

- * Do not exceed the maximum permissible input ratings (danger of serious injury and/or destruction of the equipment).
- * The meter is designed to withstand the stated max voltages. If it is not possible to exclude without that impulses, transients, disturbance or for other reasons, these voltages are exceeded a suitable prescale (10:1) must be used.
- * Replace a defective fuse only with a fuse of the original rating. Never short-circuit fuse or fuse holding.
- * Disconnect test leads or probe from the measuring circuit before switching modes or functions.
- * Do not conduct voltage measurements with the test leads connected to the mA/A- and COM-terminal of the equipment.
- * To avoid electric shock, disconnect power to the unit under test and discharge all capacitors before taking any resistance measurements.
- * Do not conduct current measurements with the leads connected to the V/ Ω -terminals of the equipment.
- * Check test leads and probes for faulty insulation or bare wires before connection to the equipment.
- * To avoid electric shock, do not operate this product in wet or damp conditions. Conduct measuring works only in dry clothing and rubber shoes, i. e. on isolating mats.
- * Never touch the tips of the test leads or probe.
- * Comply with the warning labels and other info on the equipment.
- * Always start with the highest measuring range when measuring unknown values.
- * Do not subject the equipment to direct sunlight or extreme temperatures, humidity or dampness.
- * Do not subject the equipment to shocks or strong vibrations.
- * Do not operate the equipment near strong magnetic fields (motors, transformers etc.).
- * Keep hot soldering irons or guns away from the equipment.
- * Allow the equipment to stabilize at room temperature before taking up measurement (important for exact measurements).


- * Do not input values over the maximum range of each measurement to avoid damages of the meter.
- * Do not turn the rotary function switch during voltage or current measurement, otherwise the meter could be damaged.
- * Use caution when working with voltages above 35V DC or 25V AC. These Voltages pose shock hazard.
- * Replace the battery as soon as the battery indicator "BAT" appears. With a low battery, the meter might produce false reading that can lead to electric shock and personal injury.
- * Fetch out the battery when the meter will not be used for long period.
- * Periodically wipe the cabinet with a damp cloth and mild detergent. Do not use abrasives or solvents.
- * The meter is suitable for indoor use only
- * The measurement instrument is not to be unattended.
- * Do not operate the meter before the cabinet has been closed and screwed safely as terminal can carry voltage.
- * Do not store the meter in a place of explosive, inflammable substances.
- * **-Measuring instruments don't belong to children hands-**

Cleaning the cabinet

Prior to cleaning the cabinet, withdraw the mains plug from the power outlet.


Clean only with a damp, soft cloth and a commercially available mild household cleanser. Ensure that no water gets inside the equipment to prevent possible shorts and damage to the equipment.


1.1. Table 1: Line inputs


Function	Terminal	Input Limits
V DC	V/ Ω + COM	1000 V DC
V AC	V/ Ω + COM	1000 V AC
Ohm	V/ Ω + COM	250 V DC/AC
mA DC/AC	mA + COM	500 mA/250 V
10 A DC/AC	10 A + COM	10 A/250 V
 / ((()))	V/ Ω + COM	250 V DC/AC
LOGIC	V/ Ω + COM	250 V DC/AC

1.2. Safety Symbols

The following symbols are imprinted on the meter's front panel to remind you of measurement limitations and safety:

 10 A The maximum current that you can measure at this terminal is 10 amps DC/AC. This terminal is fuse protected by FF12.5A/250 V fuse. When using this range with high current, keep the duty cycle to 30 seconds on load and 15 minutes off load.

 mA The max. current, that you can measure at this terminal is 500 mA DC/AC. This terminal is fuse protected by F630 mA/250 V fuse.

 To avoid electric shock or instrument damage, do not connect the common input COM and V/ Ω terminal to any source of more than 1000 volts with respect to earth ground.



The max. voltage this meter can measure is 1000 V DC/AC.



Be exceptionally careful when measuring high voltages. Do not touch the terminals or test leads ends. Refer to the complete operating instructions.



Both direct and alternating current



Indicates protection class II; Double insulation

CAT II

Overvoltage category II

2. Preparation for Operation

2.1. Power Cable

The detachable supply cable, comprising of 3 core PVC cable permanently molded to fully shrouded 3-pin socket, fits in the power input plug recess and should be fitted fully. The supply lead should be connected to a grounded AC power receptacle ensuring, that the ground lead is connected, to avoid electrical shock.

2.2. Line voltages

Your instrument is operative within the line voltage ranges of 115/230 V \pm 10% at 50/60 Hz; max. power consumption 10 W.

Disconnect all test cables, probes and power cord while changing the line voltage you desired.

2.3. Bench Mounting

This instrument is fitted for rubber feet. It is intended to stand on a bench located at least 30 cm free space at the rear. In addition, plastic tilt-stand is provided to facilitate the viewing angle of the instrument from the bench-level.

2.4. Using the test leads

Use only the type of test leads supplied with your meter. These test leads are rated for 1000 volts.

Warning!

- * If you try to measure voltages above 1000 V DC/AC, you might damage your instrument and expose yourself to a serious shock hazard. Use extreme care when you measure high voltages.
- * Never connect the test leads plug into the COM – terminal to a source of voltage greater than 1000 V with respect to earth ground. This creates a serious shock.

3. Specifications

3.1. General Specifications

Max. Display	53000 counts 4¾-digit LCD-Display
Operating temperature	5 ... 30°C (41°F ... 86°F) < 80% RH 31 ... 40°C (87°F ... 104°F) < 50% RH
Temperature of guaranteed accuracy	+23°C ± 5°C
Max. relative humidity	80%
Altitude	up to 2000 m
Storage temperature	-20°C ... + 60°C (14°F ... 122°F)
Size	240 x 100 x 350 mm
Weight	approx. 2,5 kg

For indoor-use only.

3.2. AC Voltage/DC Voltage + AC Voltage

Range	Resolution	Accuracy		
		40 Hz - 1 kHz	1 kHz – 10 kHz	10 kHz – 20 kHz
50 mV	0,001 mV	± (0,5% + 40 dgt.)	± (1% + 40 dgt.)	± (2,5% + 40 dgt.)
500 mV	0,01 mV			
5 V	0,1 mV			
50 V	1 mV		unspecified	unspecified
500 V	10 mV			unspecified
1000 V	0,1 V		unspecified	unspecified

3.3. DC Voltage

Range	Resolution	Accuracy
50 mV	0,001 mV	± (0,03% + 6 dgt.)
500 mV	0,01 mV	
5 V	0,1 mV	
50 V	1 mV	
500 V	10 mV	
1000 V	0,1 V	

3.4. AC Current/DC Current + AC Current

Range	Resolution	Accuracy			Voltage Drop
		40 Hz ~ 10 kHz	1 kHz ~ 10 kHz	10 kHz ~ 20 kHz	
500 μ A	0,01 μ A	$\pm (0,75\% + 20 \text{ dgt.})$	$\pm (1\% + 20 \text{ dgt.})$	$\pm (2\% + 20 \text{ dgt.})$	102 μ V/ μ A
5000 μ A	0,1 μ A	$\pm (0,75\% + 10 \text{ dgt.})$	$\pm (1\% + 10 \text{ dgt.})$	$\pm (2\% + 10 \text{ dgt.})$	
50 mA	1 μ A	$\pm (0,75\% + 20 \text{ dgt.})$	$\pm (1\% + 20 \text{ dgt.})$	$\pm (2\% + 20 \text{ dgt.})$	1,5 mV/mA
500 mA	10 μ	$\pm (0,75\% + 10 \text{ dgt.})$	$\pm (1\% + 10 \text{ dgt.})$	$\pm (2\% + 10 \text{ dgt.})$	
5 A	0,1 mA	$\pm (0,75\% + 20 \text{ dgt.})$	$\pm (1,5\% + 20 \text{ dgt.})$	$\pm (5\% + 20 \text{ dgt.})$	30 mV/A
10 A	1 mA	$\pm (1,0\% + 10 \text{ dgt.})$	$\pm (1,5\% + 10 \text{ dgt.})$	unspecified	

3.5. DC Current

Range	Resolution	Accuracy	Voltage Drop
500 μ A	0,01 μ A	$\pm (0,15\% + 15 \text{ dgt.})$	102 μ V/ μ A
5000 μ A	0,1 μ A		
50 mA	1 μ A		1,5 mV/mA
500 mA	10 μ A		
5 A	0,1 mA		30 mV/A
10 A	1 mA		

3.6. Resistance

Range	Resolution	Accuracy
500 Ω	0,01 Ω	$\pm (0,1\% + 10 \text{ dgt.})$
5 K Ω	0,1 Ω	
50 K Ω	1 Ω	$\pm (0,1\% + 5 \text{ dgt.})$
500 K Ω	10 Ω	
5 M Ω	100 Ω	$\pm (0,1\% + 10 \text{ dgt.})$
50 M Ω	1 K Ω	$\pm (3,5\% + 20 \text{ dgt.})$

3.7. Capacitance

Range	Resolution	Accuracy
50 nF	0,01 nF	$\pm (1\% + 15 \text{ dgt.})$
500 nF	0,1 nF	
5 μ F	1 nF	$\pm (1\% + 10 \text{ dgt.})$
50 μ F	10 nF	
500 μ F	0,1 μ F	$\pm (3,5\% + 20 \text{ dgt.})$
5000 μ F	1 μ F	

3.8. Diode

Range	Resolution	Accuracy
2,5 V	0,1 mV	$\pm (1\% + 5 \text{ dgt.})$

3.9. Logic Frequency

Frequency range	Sensitivity	Accuracy
5 Hz ~ 2 MHz	Vp 2 ~ 5 V square wave	± (0,006% + 4 dgt.)

3.10. Linear Frequency

Frequency range	Voltage/Current range	Sensitivity	Accuracy
5 Hz ~ 200 kHz (sine wave)	mV	4 mV	± (0,006% + 4 dgt.)
	5 V	0,5 V	
	50 V	4 V	
	500 V	40 V	
	1000 V	400 V	
	μA	40 μ	
	mA	4 mA	
	A	0,4 A	

3.11. Duty Ratio

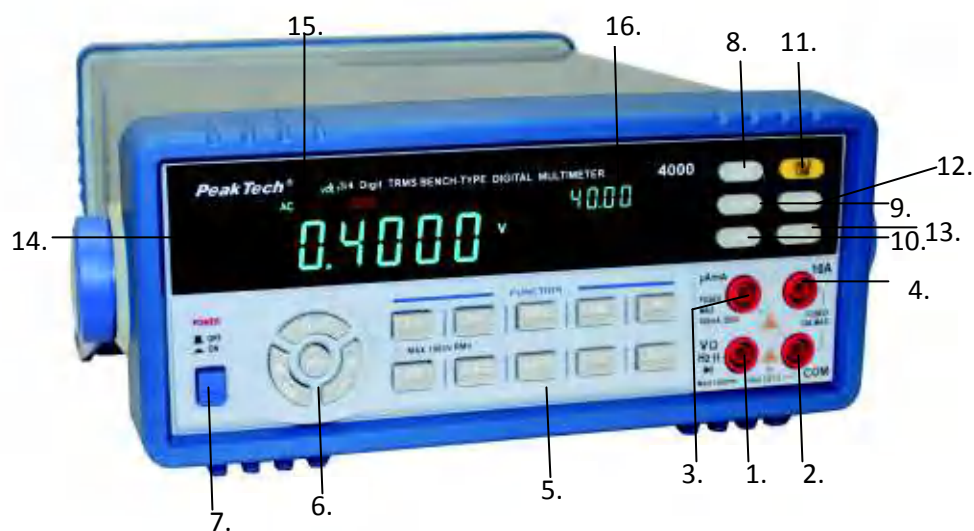
Frequency range	Duty ratio range	Resolution	Accuracy
5Hz ~ 500 kHz	10% ~ 90%	0,01%	± (10%)

3.12. Continuity Test

Range	Audible Threshold	Response Time	Test current
500 Ω	less than 50Ω	approx. 100 ms	< 0,7 mA

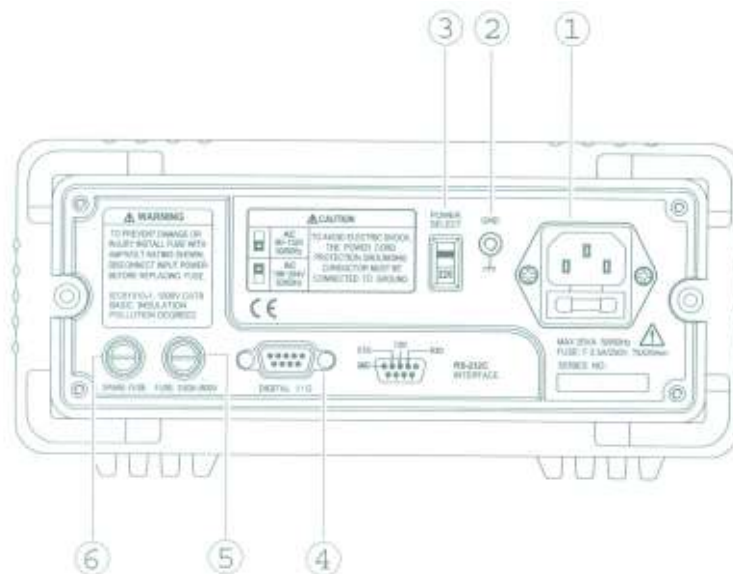
4. Front Panel Description

Front Side View of *PeakTech*® 4000



- 1.) V/Ω/Hz- input socket
- 2.) COM-input socket
- 3.) μ A/mA-input socket
- 4.) 10A-input socket
- 5.) Function keys
- 6.) Memory operation keys
- 7.) Power-switch
- 8.) SELECT-key
- 9.) RANGE-key
- 10.) REL-key
- 11.) DATA-HOLD
- 12.) MAX/MIN
- 13.) Hz-key
- 14.) Primary display
- 15.) Range indicator
- 16.) Secondary display

Rear Side View of *PeakTech*® 4000



- 1.) Power socket included fuse
- 2.) Earth pin
If ground line in power socket is not connected to earth reliably, should connect the pin to earth.
- 3.) Power selection switch (115V / 230V)
- 4.) RS-232-interface socket
- 5.) μ A/mA.fuse holder (0,63A/250V)
- 6.) holder for spare fuse (0,63A/250V)

5. Pre-Operation Check

To ensure correct operation and familiarize yourself with the instrument, follow these steps before using the instrument.

1. Press POWER-Switch to ON
2. To select function, press FUNCTION-switch
3. Press RANGE-switch at your desire
4. To select an additional operation, press the special function buttons (save, Recall)

6. How to use the instrument

This section describes the instrument and how to use it. For easy reference, each description is numbered and keyed to the illustration inside the front cover.

These buttons are used to select measuring range, operating modes. An annunciate is displayed to indicate, that a mode or function has been selected.

1. Power

Push POWER to turn the instrument on. Press again to turn off.

2. Function

Push FUNCTION-Switches to select the mode of measurement.

DC V:

Select mode of measuring DC Voltage (0 mV ... 1000 V DC).

AC V:

Select mode of measuring AC Voltage (0 mV ... 750 V AC).

Ohm:

Select mode of measuring Resistance (0 Ω ... 40 M Ω).

DC A:

Select mode of measuring DC Ampere (0 μ A ... 10 A DC).

AC A:

Select mode of measuring AC Ampere (0 μ A ... 10 A AC).

((.)):

Select mode of checking diodes and continuity.

6.1. Input Terminals

The following items describe the input terminals (See Table 1 for input limits).

10 A:

For current measurement (AC or DC) up to 10 A when you pressed FUNCTION – Switch at DC A or AC A.

μA/mA-input:

For current measurements (AC or DC) up to 500 mA, when you pressed FUNCTION – Switch at μA or mA.

COM:

Return terminal for all measurement (black test lead).

V/Ω:

Volts, Ohm, Continuity, Diode, Frequency and Logic Test terminal (red test lead).

6.2. Digital LED-Displays

1. Digital Display

Digital readings are displayed on a 53.000 counts display with automatic polarity indication and decimal point placement.

2. OL (Overload indication)

OL is displayed and beep sounds when input is too excessive to display.

6.3. Using the programmed function FUNC

Automatic and manual range selection

Range-button RANGE

- * Select your function to measure
- * Press the RANGE-button to activate the manual range-selection.
- * Press the RANGE-buttons to choose the range for measurement
- * To release this function and hold RANGE-Button for 2 seconds-

6.4. Data Hold

The Data Hold feature lets you hold a reading on the display. To turn on the hold feature, press HOLD-button. "HOLD" appears on the display. To release this function, press HOLD button again.

6.5. REL Relative Measurement

The relative measurement feature lets you measure values relative to a reference value and then measure the difference between the actual value and the reference value.
Follow the steps to set a reference value:

1. Take a reading of your reference value
2. Press the REL-button to activate the REL-Mode, REL appears on the display
3. The measured reference value will be shown in the left secondary display
4. Take your further measurements and see the differences between the reference and the actual values in the primary display.

6.6. MEM - Memory

Follow these steps to store up to ten measured values in memory for later recall:

The DMM provides 30 internal memories.
Follow these steps to save a measured value:

1. Choose the needed measuring function.
2. Make the measurement until the measured value is displayed on the display.
3. Press MEM-button to save the actual value to the next free memory place.
The display shows the memory place, where the value will be saved. (0 to 30).
4. To delete the complete memory (0-30), release the MEM-function by pressing MEM-button, then press the CLEAR-button for 2 seconds.

Note:

If you store a reading into a memory location, which already has stored a data, the old data will be updated with the new value.

6.7. RCL Memory Recall

Follow these steps to recall a measured value from one of the 30 memories.

1. Press View-button.
In the display appears the next free memory.
1. Press View ▲ or View ▼ to recall the needed memory place, the saved value will be shown next.
3. To release the recall function, press MEM-button.

7. Making Measurements

This section describes some common applications for your instrument and alert you to some considerations to keep in mind when making measurements.

7.1. Measuring DC Voltages



Warning !!

- * Do not try to measure a voltage greater than 1000 Volts DC since it may damage your instrument and expose yourself to a severe shock hazard.
- * Do not touch circuits or a part of circuits when measuring voltage above 35 V DC.

Follow these steps to measure DC Voltage:

1. Press FUNC – Switch "DC V"
2. Press RANGE – Switch to select the range as required to the voltage level to be measured. If you do not know the voltage level, start with the range selection to the highest voltage position and reduce the range position as needed to get a reading.
3. Plug the black test lead into the COM terminal and the red test lead into V/ Ω terminal.
4. Connect the test leads to the DC Voltage source you want to measure.

Notes:

- * If display is negative, "-" appears on the left of the display
- * For the most accurate measurement, select the lowest possible voltage range without getting an overload reading.
- * Input impedance: 10 MOhm

7.2. Measuring AC Voltage



Warning !!

- * Do not try to measure a voltage greater than 1.000 volts AC since it may damage your instrument and expose yourself to a severe shock hazard.
- * Do not touch the circuits or a part of circuits when measuring high voltages above 25 V AC_{rms}.

Follow these steps to measure AC Voltage:

1. Press Function-Switch "AC V". AC appears on the display.
2. Press RANGE-Switch to select the range as required for the voltage level to be measured. If you do not know the voltage level, start with the range selection to the highest voltage position and reduce the range position as needed to get a reading.
3. Plug the black test lead into the COM – terminal and the red test lead into V/ Ω - terminal.
4. Connect the test lead to the AC voltage source you want to measure.

Notes:

- * Your meter will show frequency values in the right secondary display and dB(m) in the left secondary display depending on the input AC voltage source.
- * The value of dB(m) indicated a logarithmic ratio of input voltage to the standard value stored.

Input Voltage	dB (m)
0,775 mV	-60 dB
109 mV	-17 dB
1,94 mV	8 dB
19,4 mV	28 dB

- * Input impedance: 10 MOhm in parallel with less than 100 pF.
- * Frequency response: 40 Hz to 20 kHz
- * The meters high input sensitivity produces a wandering effect, when the test leads are not connected to any circuit. This is normal and an accurate reading will appear, when you connect the test leads to a circuit to be measured.

7.3. Measuring DC/AC Currents

Warning !!

Never attempt to measure currents in circuits with voltages over 250 volts DC/AC. It may damage the instrument and expose yourself to a severe shock hazard. A severe fire hazard and short circuit danger exists if you apply a voltage with high current capability to this terminal. The 10 A-terminal is fuse protected. Never measure currents exceeding 10 A. When using this range with high currents, keep the duty cycle to 30 seconds on load and 15 minutes off load.

Follow these steps to measure AC/DC current:


1. Press FUNC-Switch "AC A" or "DC A". AC appears for AC current measurement.
2. Plug the black test lead into the COM-terminal and the red test lead into the μ A/mA or 10 A-terminal depending on the range you selected.
3. Connect the test leads in series with the load or circuits.

Notes:

- * If you do not know what the current is, connect the circuit to 10 A input-terminals first to see, if you have safe level for the mA input terminal. Use A terminal for current up to 500 mA.
- * When measuring current, the meter's internal shunt resistors develop a voltage across the instrument's terminals so called "burden voltage". This voltage is very low, but it may affect precision circuits and measurements.
- * If you set the function DC current, the Symbol "-" appears or disappears to indicate the polarity of the measured value.

7.4. Logic Frequency/Duty Ratio Measurement


The frequency range is of 5Hz ~ 2MHz (Vp 2.5 ~ 5V), while the duty ratio measurement range being of 10% ~ 90%. And the measurement methods are as follows:

1. Turn on the power switch and press  button.
2. Insert the red testing line into the V/Ω/Hz end and the black testing line into the COM end.
3. Connect the red testing line to high logic level, the black one to low logic level.
4. Read the measured value from the display screen. If the frequency of the measured signal is lower or higher than the meter's measurement range, the reading will be displayed as zero. If the amplitude of signal is too low or the low level is larger than 1 volt, the reading will also displayed as zero.
5. This measurement is of automatic range, it is null to press the RANGE key.
6. By pressing SELECT key, the meter measures Duty Ratio and display it on the second display zone. Press SELECT key again to stop Duty Ratio display

7.5. Checking Diodes

This function lets you check diodes and other semiconductors for opens and shorts. It also lets you determine the forward voltage for diodes. You can use this function, when you need to match diode.

Follow these steps to measure the frequency of a signal:

1. Press FUNC-Switch .
2. Plug the black test lead into the COM-terminal and the red test lead into the V/Ω-terminal.
3. Connect the test lead to the diode to be checked and read the display.

Notes:

- * If you check a diode's forward voltage, you will measure voltage of approx. 1,25 V (Germanium) or 0,7 V (Silicon) if the diode is not defective.
- * If "OL" is displayed, it means the diode is open or above 2,0 V forward voltage. However, if the display shows a value between 0 V and approx. 2.0 V, it means a forward drop voltage.
- * The instrument supplies enough forward voltage to light most LED's. However, if the LED's forward voltage is greater than 2.0 volts, the instrument incorrectly indicates, that the device is open.

7.6. Checking Continuity

Continuity testing verifies that circuit connections are intact.

Warning!

Never perform a continuity checking on a circuit, that has power connected.

Follow these steps to perform audible continuity test:

1. Press FUNC-Switch 

2. Plug the black test lead into the COM-terminal and the red test lead into the V/ Ω -terminal.
3. Remove power from the circuit.
4. Connect the test lead tips to the object to be measured.

Note:

The buzzer will sound, if the measured resistance from the components is below about 50 ohms approx. and the middle secondary display will show "Shrt" to indicate a state of short.

7.7. Measuring Resistance



Warning !!

Never connect the test leads to a source of voltage, when you have selected the ohms function and plugged the test lead jack into V/ Ω terminal.
Be sure, that the circuit under test has all power removed and any associated capacitors are fully discharged before you make a resistance measurement.

Follow these steps to measure resistance.

1. Press FUNC-Switch "OHM".
2. Plug the black test lead into the COM-terminal and the red test lead into the V/ Ω -terminal
3. Connect the test leads to the object to be measured.

Notes:

- * The resistance in the test leads can diminish the accuracy on the lowest 200 Ohm range. The error is usually 1 to 0,2 ohms for a standard pair of test leads. To determine the error, short the test leads together and read the resistance of the test leads.
- * When measuring resistance, be sure, that the contact between the test leads and the object is good. Dirt, oil, solder flux or other foreign matters can cause incorrect readings.
- * If the measured resistance value exceeds the max. value, "OL" will be displayed indicating overload and bar graph will be flashing.
- * For resistance of approx. 2 MOhm and above, the display might take a few seconds to stabilise. This is normal for high resistance readings.
- * During resistance measurements, the present value is in the main display, the measured value taken 1 second earlier in the upper secondary display, the measured value taken 2 seconds earlier in the middle secondary display and the measured value taken 3 seconds earlier in the lower secondary display.

7.8. Capacitance measurements

Caution!

Turn off power and discharge the capacitor before attempting a capacitance measurement. Use the DCV function to confirm that the capacitor is discharged.

1. Press $\frac{1}{f}$ button.
2. Insert red test lead to V/ Ω /Hz-input and black test lead to the COM-input.
3. Connect the test leads to the capacitor. Observe polarity when measuring polarized capacitors.
4. Read the capacitance directly from the display. A shorted capacitor will indicate an over range. An open capacitor will indicate near zero on all ranges.

7.9. Measuring Frequency



Warning !!

Do not try to measure the frequency of a signal that exceeds 250 volts AC_{rms}. It may damage your instrument and expose yourself to a severe shock hazard. Follow these steps to measure the frequency of a signal.

1. Press Function-Switch "Hz".
2. Plug the black test lead into the COM-terminal and the red test lead into the V/ Ω -terminal.
3. Connect the test lead to the frequency source. It will automatically select and display appropriate frequency ranges up to 200 kHz.

Warning:

When the test leads are connected to an AC outlet, do not select other ranges. It might damage the internal components or cause bodily injury.

Notes:

- * For the most accurate frequency measurements, we strongly recommend you to use a BNC cable with ferrite core.

Range	Sensitivity (sinus)
mV	4 mV
5 V	0,5 V
50 V	4 V
500 V	40 V
1000 V	400 V
μ A	40 μ A
mA	4 mA
10 A	0,4 A

8. How to use the instrument with a PC

8.1. Connection of the instrument with a computer

Follow these steps to connect the instrument to a computer:

1. Connect the supplied RS-232 USB Interface cable with the RS-232 Port on the back side of the device.
2. Start your computer and connect the interface-cable with a USB-Port.
3. Turn on the computer.
4. Proceed driver installation as described in chapter 8.2.

8.2. Installation of the supplied software

We have included a software program in Windows to log and display data collected with your instrument. The program is called "**Bench Multimeter**". The Software can be used with Windows XP, Vista and 7 Systems.

Follow these steps to install and run the software:

1. Start your computer and run Windows.
2. Insert the supplied CD in your computers drive.
3. Open the CD-folder manual with "Computer".
4. Execute the "Bench Multimeter.exe" in the folder "Software".
5. Follow ON-Screen prompts to complete the installation.
6. To run the program, double click the "Bench Multimeter" icon on your desktop.
7. Activate the Interface of your device by pressing the "HOLD/USB"-key for ~2 sec. until "RS-232" lights up in the display.
8. In the Software, select the COM-Port of the device as you can find under the "Windows Device Manager" (e.g. COM 3)

8.3. USB-driver Installation

1. Connect the multimeter to your PC-System
2. Windows starts the automatic driver search function- an internet connection is required
3. After the driver installation, a COM-Port is assigned to the device in the "Windows Device Manager"

Note:

If no COM-Port is assigned to the device in the "Device Manager", it seems that the automatic driver search did not work properly. You can find the latest USB-driver on our homepage for manual Installation.

9. Care and Maintenance

Your instrument is a precise electronic device. Do not tamper with the circuit. To prevent electric shock hazard, turn off the power and disconnect the probes or connectors from the mains before removing the cabinet, if needed.

9.1. General Maintenance

Any adjustments, maintenance or repair of the instruments, except fuse replacement should be done only by qualified service personal.

1. Use and store your meter only in normal temperature environments. Extreme temperatures can shorten the life of electronic devices and distort or melt plastic parts.
2. Keep your instrument dry. If it does get wet, wipe it dry immediately. Liquids might contain minerals, that can corrode the electronic circuit.
3. Handle your instrument gently and carefully. Dropping it can damage circuit boards and cases and cause the instrument to work improperly.
4. Keep your instrument away from dust and dirt, which can cause premature wear of parts.
5. Prior to cleaning the cabinet, disconnect the mains plug from the power outlet. Clean only with a damp, soft cloth and a commercially available mild household cleaner. Ensure, that no water gets inside the instrument to prevent possible shorts and damage to the instrument.

Modifying or tampering with your instrument's internal components can cause a malfunction and might invalidate its warranty.

9.2. Replacing the fuse

Caution !

For continued protection against fire or other hazard, replace only with fuse of the specified voltage and current ratings.

Power line fuse: (115 V, 60 Hz); F1,0 A/250 V
(230 V, 50 Hz); F0,5 A/250 V

10 A-terminal fuse: FF 12,5 A/250 V
mA-terminal fuse: F 0,63 A/250 V

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This manual is according the latest technical knowing. Technical changings which are in the interest of progress, reserved.

We herewith confirm that the units are calibrated by the factory according to the specifications as per the technical specifications.

We recommend to calibrate the unit again, after 1 year.

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