PeakTech®

Prüf- und Messtechnik

Spitzentechnologie, die überzeugt

PeakTech® 1080

# Bedienungsanleitung / Operation manual

# Digital Pen-Type-Multimeter

# 1. Safety Precautions

This product complies with the requirements of the following European Community Directives: 2014/30/EU (Electromagnetic Compatibility) and 2014/35/EU (Low Voltage) as amended by 2004/22/EC (CE-Marking).
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: Distribution level, fixed installation, with smaller transient overvoltages than CAT IV.
CAT IV: Units and installations, which are supplied overhead lines, which are stand in a risk of persuade of a lightning, i.e. main-switches on current input, overvoltage-diverter, current use counter.

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.
Damages resulting from failure to observe these safety precautions are exempt from any legal claims whatever.

* Do not use this instrument for high-energy industrial installation measurement.
* Do not exceed the maximum permissible input ratings of 600V AC/DC (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.
* 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- 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 60V DC or 30V AC. These Voltages pose shock hazard.
* Replace the battery as soon as the battery indicator "  " 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 mid detergent. Do not use abrasives or solvents.
* The meter is suitable for indoor use only
* 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.
* Do not modify the equipment in any way
* Opening the equipment and service – and repair work must only be performed by qualified service personnel
* **Measuring instruments don't belong to children hands.**

## 1.1. Safety Symbols

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

| | |
|---|---|
|  | Dangerously high voltage between the inputs. Extreme caution when measuring. Do not touch the inputs and measuring tips. |
|  | Refer to the complete operating instructions. |
|  | To avoid electric shock or instrument damage, do not connect the common input COM and V/mA/Ω terminal to any source of more than 600 V with respect to earth ground. |
|  | Double insulation (Protection class II) |
| **CAT III** | Overvoltage category III |
|  | Earth ground |
| **AC** | Alternating current |
| **DC** | Direct current |
|  | AC or DC (alternating current or direct current) |
|  | Diode |
|  | Continuity buzzer |
| **M.H** | The maximum value is being held |
| **D.H.** | This indicates that the display data is being held |
| **AUTO** | Auto range |
|  | The battery is not sufficient for proper operation |

**CAUTION!**

**Note on using the supplied safety test leads according the IEC / EN 61010-031:2008:**

Measurements in the field of overvoltage category CAT I or CAT II can be performed with test leads without sleeves with a maximum of up to 18mm long, touchable metallic probe, whereas for measurements in the field of overvoltage category CAT III or CAT IV test leads with put on sleeves, printed with CAT III and CAT IV must be used, and therefore the touchable and conductive part of the probes have only max. 4mm of length.

# 2. Technical Data

## 2.1. General

| | |
|---|---|
| Display | 3 ½-digit 11 mm LCD<br>indication: 1999 |
| max. Voltage<br>between terminals and<br>earth ground | 600 V DC/$AC_{rms}$ |
| Ranging Method | Auto or manual |
| Sampling rate | 2.5 times per second |
| Polarity indication | “-” displayed automatically |
| Overload indication | “OL” displayed |
| Low battery indication | “BAT” indicates low battery |
| Power Supply | 2 x 1.5 Batteries AAA (UM4) |
| Fuse protection | FF400mA/600V (6.3x32mm) |
| Auto power off | after 15 minutes |
| Operating temperature | 0° C...40° C < 80 % RH |
| Storage temperature | -10°C ...+50°C < 70 % RH |
| Dimensions (HxWxD) | 222 x 40 x 29 mm |
| Weight | 130 g (Batteries included) |
| Accessories | 2 pcs. test leads, 2 pcs. 1.5 V AAA |

## 2.2. Functions and Ranges

Accuracy is specified for a period of one year after calibration and 18°C to 28°C with relative humidity of 75%

**DC Voltage**

| Range | Resolution | Accuracy |
|---|---|---|
| 200 mV | 0.1 mV | +/- (0.7% + 2 dgt) |
| 2 V | 1 mV | |
| 20 V | 10 mV | |
| 200 V | 0.1 V | |
| 600 V | 1 V | |

Input Impedance: 10 MΩ
Overload Protection: 250 V DC/$AC_{rms}$: 200 mV-ranges
600 V DC/$AC_{rms}$: 2 V – 600 V-ranges
max. input voltage: 600 V DC

**AC Voltage**

| Range | Resolution | Accuracy |
|---|---|---|
| 200 mV | 0.1 mV | +/- (0.8% + 3 dgt) |
| 2 V | 1 mV | |
| 20 V | 10 mV | |
| 200 V | 0.1 V | |
| 600 V | 1 V | +/- (1.0% + 3 dgt) |

Input impedance: 10 MΩ
Frequency range: 40 - 400 Hz
Overload Protection: 250V DC/$AC_{rms}$ : 200 mV-ranges
600 V DC/$AC_{rms}$ : 2 V – 600 V-ranges
max. input voltage 600 V $AC_{rms}$

**DC Current**

| Range | Resolution | Accuracy |
|---|---|---|
| 20 mA | 10 µA | +/- (1.5% + 3 dgt.) |
| 200 mA | 100 µA | |

Overload Protection: FF 400 mA/600 V (6.3 x 32mm)
Max. Input: 200 mA $DC/AC_{rms}$

**AC Current**

| Range | Resolution | Accuracy |
|---|---|---|
| 20 mA | 10 µA | +/- (2.0% + 3 dgt.) |
| 200 mA | 100 µA | |

Overload Protection: FF 400 mA/600 V (6.3 x 32mm)
Frequency range: 40-200 Hz
Max. Input: 200 mA $DC/AC_{rms}$

**Resistance**

| Range | Resolution | Accuracy |
|---|---|---|
| 200 Ω | 0.1 Ω | +/- (1.0% + 3 dgt) |
| 2 kΩ | 1 Ω | +/- (1.0% + 1 dgt) |
| 20 kΩ | 10 Ω | |
| 200 kΩ | 100 Ω | |
| 2 MΩ | 1 kΩ | |
| 20 MΩ | 10 kΩ | +/- (1.0% + 5 dgt) |

Overload Protection: 250 V $DC/AC_{rms}$
Open circuit voltage: approx. 250 mV

**Diode**

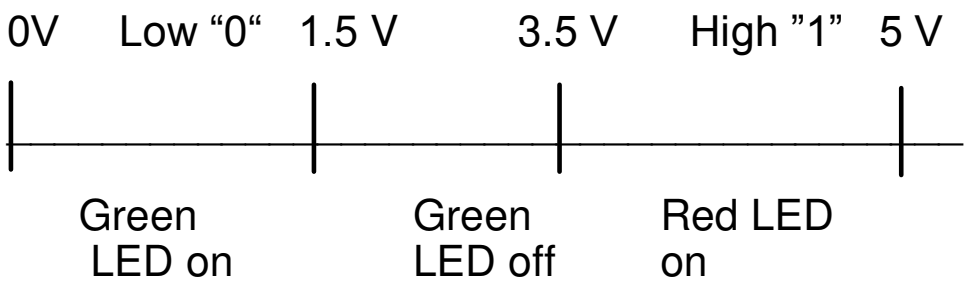
| Range | Resolution | Function |
|---|---|---|
|  | 0.001 V | Displays approx. forward-biased voltage |

Forward DC Current: approx. 1 mA
Reversed DC Voltage: approx. 1.5 V
Overload protection: 250 V DC/$AC_{rms}$

**Audible continuity**

Audible threshold: Less than 50 Ω
Open circuit voltage: approx. 0.5 V
Overload protection: 250 V DC/$AC_{rms}$

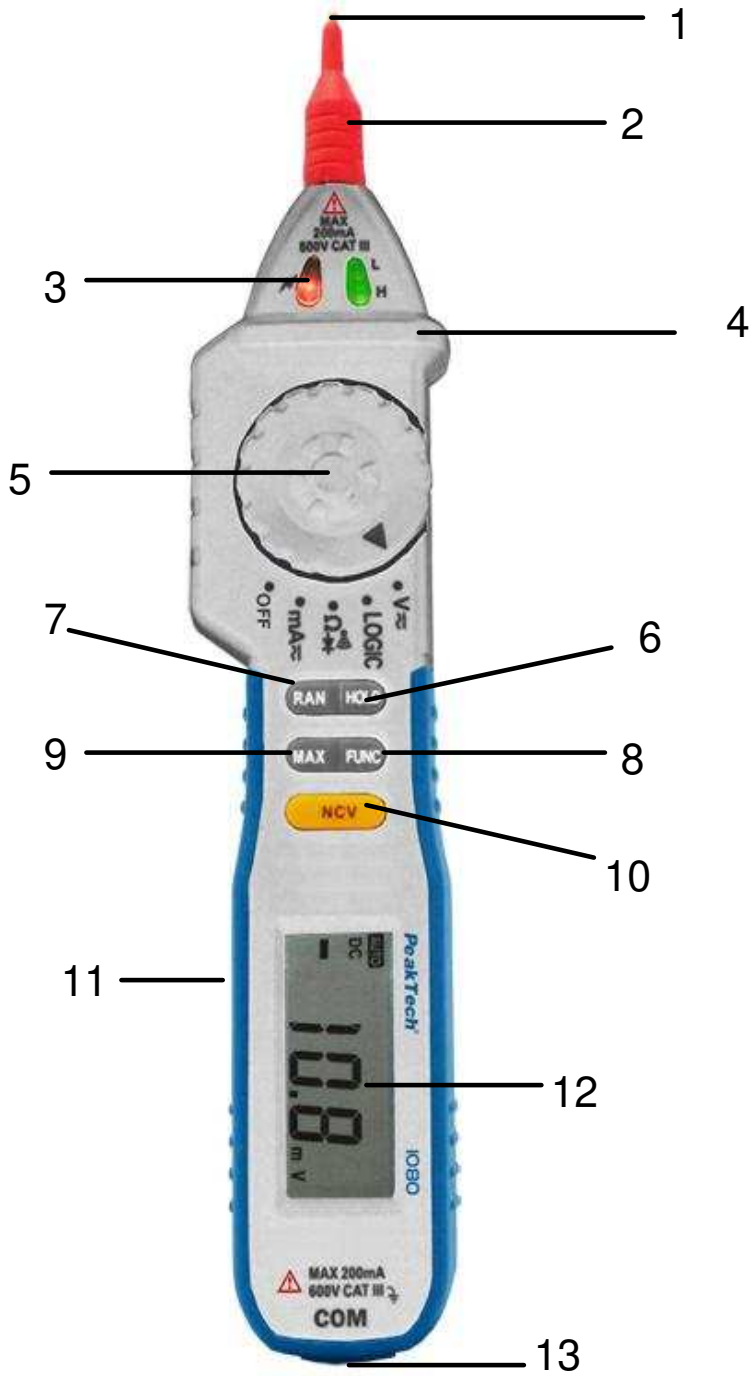
**Logic Test**

| Range | Description |
|---|---|
| LOGIC |  |



Input Impedance: approx. 1 MΩ
Overload Protection: 250 V DC/$AC_{rms}$

## 3. Front Panel Description



1. Probe Tip
2. Removable protective cap for measurements in CAT III conditions
3. LED-Indicator for Logic-Test
4. Protection Ring
5. Function Switch
6. DATA-HOLD push button
7. RANGE-HOLD push button
8. FUNC push button
9. MAX-HOLD push button
10. NCV push button for voltage detector
11. Handle grip
12. LCD-display
13. COM-input socket

# 4. Operation

## 4.1. Data Hold

If you need data hold when measuring, you can put on “HOLD” button, it will hold the reading; if you put the button again, data hold is not continue.

## 4.2. Maximum value measuring and Hold (MAX HOLD)

At the range of voltage, you can put on “MAX” button, it will hold the maximum value; if you put the button again, the maximum value will not be held.

## 4.3. Function Transform (FUNC)

Put down the “FUNC” button when measuring the voltage. Meter will be transformed between DC and AC range. Put FUNC button when measuring the resistance, diode and continuity, meter will transform among them.

## 4.4. Range Transform

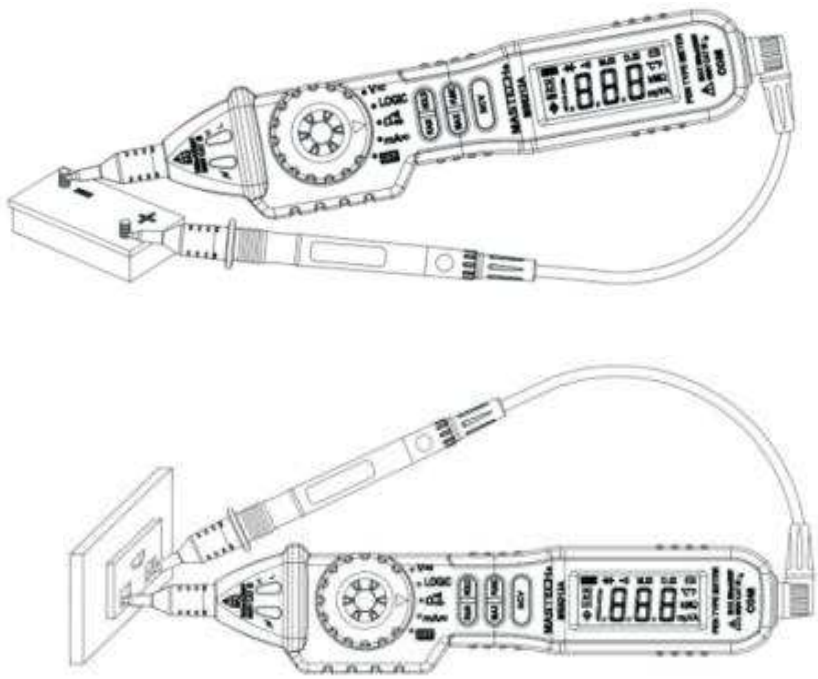
The auto range is used when measuring the voltage and resistance. Put down the “RAN” button if the manual range is needed. Each time you put down, range will go upward; the minimum range is transformed if “RAN” button is put down at the maximum range. If the “RAN” button is put down more than two seconds, auto range is used again.

## 4.5. Voltage measurements

**WARNING!** Do not try to measure a voltage greater than 600 V DC/AC. You might damage your meter and expose yourself to a severe shock hazard.

1. Connect the black test lead to COM jack.

2. Set the function switch at V range to be used and connect test leads across the source or load under measurement.



3. Read LCD display. The polarity of probe tip connection will be indicated when making a DC measurement.

## 4.6. Current measurements

WARNING! Do not apply voltage directly across the terminals. You must connect the meter in series with the circuit.

1. Connect the black test lead to the COM jack.

2. Set the function switch at mA range to be used and push FUNC-button to select DC or AC measuring mode.

3. Connect test leads in series with the load in which the current is to be measured.

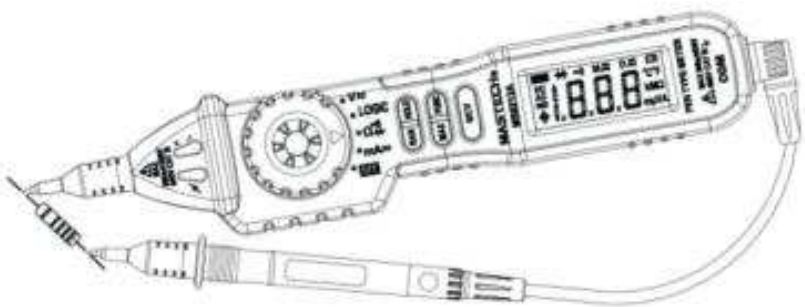
4. Read LCD display. The polarity of red lead connection will be indicated when making a DC measurement.

## 4.7. Resistance Measurements

WARNING! Be sure that the circuit under test has all power removed and that any associated capacitors are fully discharged before you make a resistance measurement.

1. Connect the black test lead to the COM jack. (Note: The polarity of the probe tip connection is positive “+”).

2. Set the function-switch at Ω-range to be used and connect test leads across the resistance under measurement.



**Note:**

* For resistance above 2 MΩ, the meter may take a few seconds to stabilise reading. This is normal for high resistance measuring.

* When the input is not connected, i. e. at open circuit or the value is greater than 20 MΩ, the figure “OL” will be displayed for the over range condition.

## 4.8. Checking Diodes

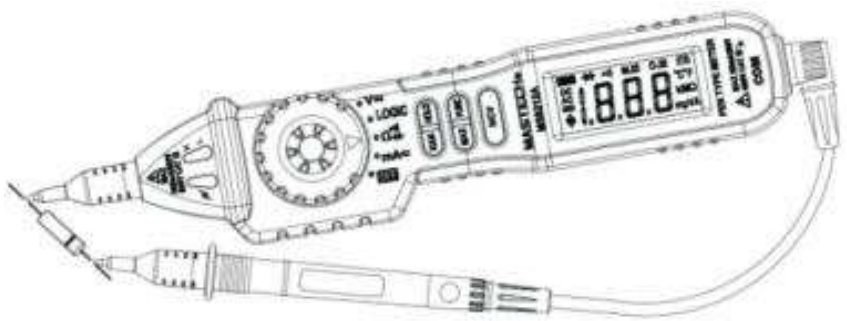
This function lets you check diodes and other semiconductors for opens and shorts. It also lets you determine the forward voltage for diodes. You can use this function, when you need to match diode.

1. Connect the black test lead to the COM-jack.

2. Set the function switch to Ω-position and press FUNC-button to set DIODE

3. Connect the test leads across the diode (probe tip is the positive pole of the diode)

4. Read the forward voltage on LCD



**NOTE:**

* If you check a diode's forward voltage, you will measure voltage of approx. 0.3 V (Germanium) or 0.7 V (Silicon) if the diode wasn't damaged.
* If "OL" is displayed, it means that 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 to light most LED's. However, if the LED's forward voltage is greater than 2.0 V, the instrument incorrectly indicates, that the device is open.

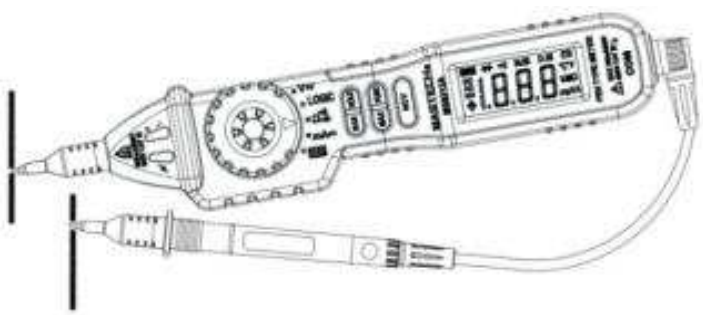
## 4.9. Continuity test

**CAUTION!** Never perform a continuity measurement on a circuit that has power connected!

1. Connect the black test lead to the COM jack. (Note: The polarity of the probe tip connection is positive “+”).

2. Set the function switch to Ω-position and push the “FUNC” button to select continuity or diode test mode.

3. In continuity testing if continuity exists (i. e. resistance less than about 50 Ω) built-in buzzer will sound.



## 4.10. Logic Test

**WARNING!**
Risk of Electrocution. You can't input the voltage which is higher than 250 V $AC_{rms}$, it may damage the inner circuit or cause electrical shock. Pay attention to avoid getting and electric shock when testing logic level.

1.) Rotate the probe socket anti-clockwise to spin the probe into the meter
2.) Insert the black test clip in the COM jack
3.) Set the transform switch at the LOGIC range position
4.) Connect the black test clip to the GND (-) of the circuits being measured
5.) Keep pressing the "FUNC" button and Touch the tip to the testing object in the circuits being measured. And observe the logic state indicated by LED light. (Red LED light expresses high level/logic "1" and green LED light expresses low level/logic "0")

**NOTE:**
* If the input open circuit (or the object's logic state is lower than 1.5 V), the green LED will be lighted.

* You must keep pressing the "FUNC" button during the logic testing.

# 5. Maintenance

## 5.1. Battery replacement

If the sign "  " appears on the LCD display, it indicates that the battery should be replaced.

**WARNING!**
Before attempting to open the battery cover of the meter, be sure that the probe tip of the meter and test lead (or test clip) have been disconnected from measurement circuit to avoid electric shock hazard.

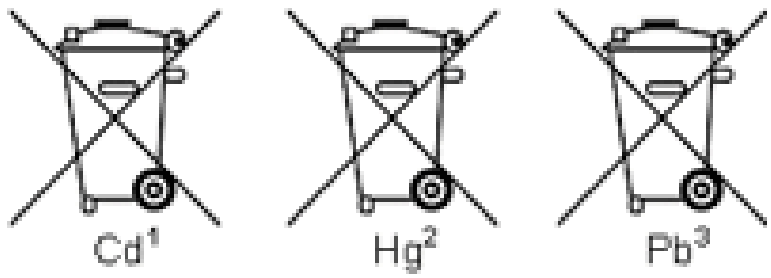
1.) If the  sign appears on the LCD display, it indicates that the battery should be replaced.
2.) Loosen the screw fixing the battery cover and remove it.
3.) Replace the exhausted battery with a new one.
4.) Put the battery cover as its origin

## Notification about the Battery Regulation

The delivery of many devices includes batteries, which for example serve to operate the remote control. There also could be batteries or accumulators built into the device itself. In connection with the sale of these batteries or accumulators, we are obliged under the Battery Regulations to notify our customers of the following:

Please dispose of old batteries at a council collection point or return them to a local shop at no cost. The disposal in domestic refuse is strictly forbidden according to the Battery Regulations. You can return used batteries obtained from us at no charge at the address on the last side in this manual or by posting with sufficient stamps.

Contaminated batteries shall be marked with a symbol consisting of a crossed-out refuse bin and the chemical symbol (Cd, Hg or Pb) of the heavy metal which is responsible for the classification as pollutant:




1. "Cd" means cadmium.
2. "Hg" means mercury.
3. "Pb" stands for lead.

*This manual considers 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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