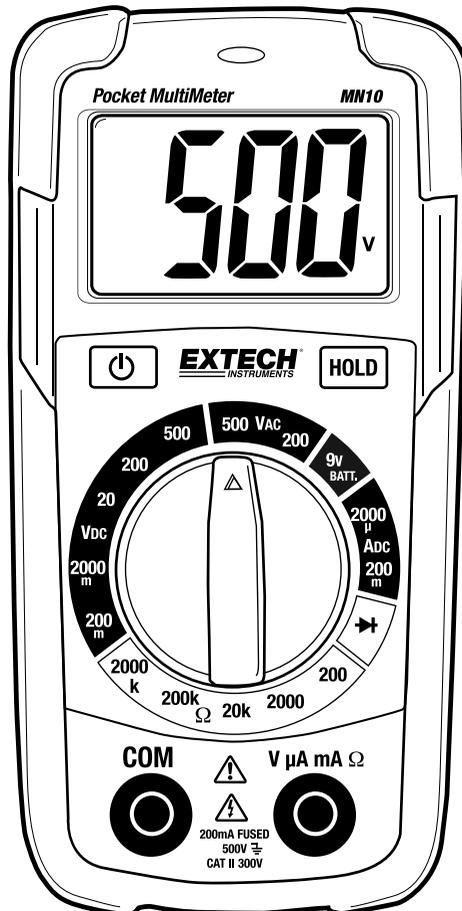


## Pocket MultiMeter

### Model MN10



## Introduction

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Congratulations on your purchase of the Extech MN10 Pocket Multimeter. This meter measures AC/DC Voltage, DC Current, Resistance, Diode Test, and Battery test. It features a rugged design for heavy duty use. This meter is shipped fully tested and calibrated and, with proper use, will provide years of reliable service.

## Safety

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This symbol adjacent to another symbol, terminal or operating device indicates that the operator must refer to an explanation in the Operating Instructions to avoid personal injury or damage to the meter.

**WARNING**

This **WARNING** symbol indicates a potentially hazardous situation, which if not avoided, could result in death or serious injury.

**CAUTION**

This **CAUTION** symbol indicates a potentially hazardous situation, which if not avoided, may result damage to the product.



This symbol advises the user that the terminal(s) so marked must not be connected to a circuit point at which the voltage with respect to earth ground exceeds 500 VAC or VDC.



This symbol adjacent to one or more terminals identifies them as being associated with ranges that may, in normal use, be subjected to particularly hazardous voltages. For maximum safety, the meter and its test leads should not be handled when these terminals are energized.



This symbol indicates that a device is protected throughout by double insulation or reinforced insulation.

## SAFETY INSTRUCTIONS

This meter has been designed for safe use, but must be operated with caution. The rules listed below must be carefully followed for safe operation.

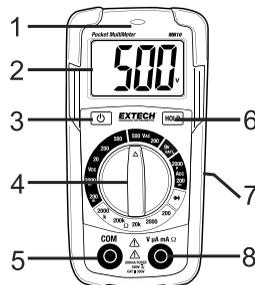
- NEVER** apply voltage or current to the meter that exceeds the specified maximum:

Input Protection Limits	
Function	Maximum Input
V DC or V AC	500VDC/AC
mA AC/DC	200mA AC/DC
Resistance, Diode Test	500VDC/AC

- USE EXTREME CAUTION** when working with high voltages.
- DO NOT** measure voltage if the voltage on the "COM" input jack exceeds 500V above earth ground.
- NEVER** connect the meter leads across a voltage source while the function switch is in the current, resistance, or diode mode. Doing so can damage the meter.
- ALWAYS** discharge filter capacitors in power supplies and disconnect the power when making resistance or diode tests.
- ALWAYS** turn off the power and disconnect the test leads before opening the covers to replace the fuse or batteries.
- NEVER** operate the meter unless the back cover and the battery and fuse covers are in place and fastened securely.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

## Controls and Jacks

- NCV indicator lamp
- LCD Display
- Power button
- Function switch
- COM jack
- Data Hold button
- Battery compartment (rear)
- Positive jack



## Symbols and Annunciators

	Diode test	$\Omega$	Ohms
	Low Battery	V	Volts
$\mu$	micro	A	Amps
m	milli	AC	Alternating current
A	Amps	DC	Direct current
k	kilo		

## Operating Instructions

**WARNING:** Risk of electrocution. High-voltage circuits, both AC and DC, are very dangerous and should be measured with great care.

1. ALWAYS switch the meter OFF when the meter is not in use using the power on/off button.
2. If "1" appears in the display during a measurement, the value exceeds the range you have selected. Change to a higher range.

**NOTE:** On some low AC and DC voltage ranges, with the test leads not connected to a device, the display may show a random, changing reading. This is normal and is caused by the high-input sensitivity. The reading will stabilize and give a proper measurement when connected to a circuit.

### NON-CONTACT VOLTAGE (NCV)

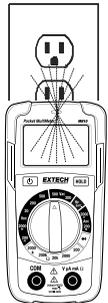
The meter can detect the presence of AC voltage (from 100 to 600VAC) simply by being held very near to a voltage source.

**WARNING:** Test the AC voltage detector on a known live circuit before each use.

**WARNING:** Before using the meter in the AC Voltage Detector mode, verify that the battery is fresh by confirming characters appear on the LCD when the function dial is turned to any position. Do not attempt to use the meter as an AC Voltage Detector if the battery is weak or bad.

The NCV function works on any rotary switch position.

1. Turn the meter on.
2. The NCV function works with the meter's function switch set to any position.
3. Be sure to test the NCV function on a known live circuit before use.
4. Hold the top of the meter very close to the voltage source.
5. If voltage is present, the red LED indicator directly above the meter's LCD display will solidly illuminate.



### DC VOLTAGE MEASUREMENTS

**CAUTION:** Do not measure DC voltages if a motor on the circuit is being switched ON/OFF. Large voltage surges may occur that can damage meter.

1. Set the function switch to the highest V DC position.
2. Insert the black test lead banana plug into the negative (COM) jack. Insert the red test lead banana plug into the positive (V) jack.
3. Touch the black test probe tip to the negative side of the circuit. Touch the red test probe tip to the positive side of the circuit.
4. Read the voltage in the display. Reset the function switch to successively lower V DC positions to obtain a higher resolution reading. The display will indicate the proper decimal point and value. If the polarity is reversed, the display will show (-) minus before the value.



## AC VOLTAGE MEASUREMENTS

**WARNING:** Risk of Electrocution. The probe tips may not be long enough to contact the live parts inside some 240V outlets for appliances because the contacts are recessed deep in the outlets. As a result, the reading may show 0 volts when the outlet actually has voltage on it. Make sure the probe tips are touching the metal contacts inside the outlet before assuming that no voltage is present.

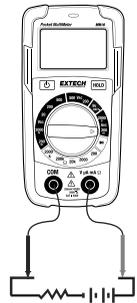
**CAUTION:** Do not measure AC voltages if a motor on the circuit is being switched ON or OFF. Large voltage surges may occur that can damage the meter.

1. Set the function switch to the highest V AC position.
2. Insert the black test lead banana plug into the negative (COM) jack. Insert red test lead banana plug into the positive (V) jack.
3. Touch the black test probe tip to the negative side of the circuit. Touch the red test probe tip to the positive side of the circuit.
4. Read the voltage in the display. Reset the function switch to successively lower V AC positions to obtain a higher resolution reading. The display will indicate the proper decimal point and value.



## DC CURRENT MEASUREMENTS

1. Insert the black test lead banana plug into the negative (COM) jack.
2. Set the function switch to the 200mA or 2000 $\mu$ A DC range position.
3. Insert the red test lead banana plug into the mA jack.
4. Remove power from the circuit under test, then open up the circuit at the point where you wish to measure current.
5. Touch the black test probe tip to the negative side of the circuit. Touch the red test probe tip to the positive side of the circuit.
6. Apply power to the circuit.
7. Read the current in the display. The display will indicate the proper decimal point and value.



## RESISTANCE MEASUREMENTS

**WARNING:** To avoid electric shock, disconnect power to the unit under test and discharge all capacitors before taking any resistance measurements. Remove the batteries and unplug the line cords.

1. Set the function switch to the highest  $\Omega$  position.
2. Insert the black test lead banana plug into the negative (COM) jack. Insert the red test lead banana plug into the positive  $\Omega$  jack.
3. Touch the test probe tips across the circuit or part under test. It is best to disconnect one side of the part under test so the rest of the circuit will not interfere with the resistance reading.
4. Read the resistance in the display and then set the function switch to the lowest  $\Omega$  position that is greater than the actual or any anticipated resistance. The display will indicate the proper decimal point and value.



## DIODE CHECK

1. Set the function switch to the  position
2. Insert the black lead banana plug into the negative (COM) jack  
Insert the red test lead banana plug into the positive (V) jack.
3. Connect the red test lead to the anode of the diode and the black lead to the cathode.
4. The forward voltage drop in mV will be displayed. If the leads are reversed, the display will indicate "1".



## BATTERY TEST

1. Insert the black test lead banana plug into the negative COM jack and the red test lead banana plug into the positive V jack.
2. Select the 9V BAT position using the function switch.
3. Connect the red test lead to the positive side of the 9V battery and the black test lead to the negative side of the 9V battery.
4. Read the voltage in the display (> 8.2V indicates good; < 7.2 indicates a bad; 7.2V to 8.2V indicates a weak)

## Maintenance

This MultiMeter is designed to provide years of dependable service, if the following care instructions are performed:

1. **KEEP THE METER DRY.** If it gets wet, wipe it off.
1. **USE AND STORE THE METER IN NORMAL TEMPERATURES.** Temperature extremes can shorten the life of the electronic parts and distort or melt plastic parts.
2. **HANDLE THE METER GENTLY AND CAREFULLY.** Dropping it can damage the electronic parts or the case.
3. **KEEP THE METER CLEAN.** Wipe the case occasionally with a damp cloth. DO NOT use chemicals, cleaning solvents, or detergents.
4. **USE ONLY FRESH BATTERIES OF THE RECOMMENDED SIZE AND TYPE.** Remove old or weak batteries so they do not leak and damage the unit.
5. **IF THE METER IS TO BE STORED FOR A LONG PERIOD OF TIME,** the batteries should be removed to prevent damage to the unit.

## BATTERY REPLACEMENT

**WARNING:** To avoid electric shock, disconnect the test leads from any source of voltage before removing the back cover or the battery cover.

1. Disconnect the test leads from the meter.
2. Remove the Phillips head screw located on the back of the instrument and remove the battery cover.
3. Replace the 12V battery.
4. Secure the fuse/battery compartment cover.
5. Dispose of the old battery as required by local regulations.

The end user is legally bound (EU Battery ordinance) to return all used batteries, disposal in the household garbage is prohibited! Bring used batteries / accumulators to collection points in your community or wherever batteries / accumulators are sold!

Disposal: Follow the valid legal stipulations in respect of the disposal of the device at the end of its lifecycle



**WARNING:** To avoid electric shock, do not operate your meter until the battery cover is in place and fastened securely.

## FUSE REPLACEMENT

1. Disconnect the test leads from the meter.
2. Remove the 3 Phillips head screws securing the meter's rear cover and lift the cover off.
3. Gently remove the fuse and install the new fuse into the holder.
4. Always use fuses of the proper size and value 0.2A/250V fast blow
5. Secure the rear cover.

**WARNING:** To avoid electric shock, do not operate your meter until the rear cover is in place and fastened securely.

## Specifications

Function	Range	Resolution	Accuracy (reading)
DC Voltage (V DC)	200mV	0.1mV	±(0.5% rdg + 2d)
	2000mV	1mV	
	20V	0.01V	
	200V	0.1V	
	500V	1V	
AC Voltage (V AC) (50/60Hz)	200V	0.1V	±(1.2% rdg + 10d)
	500V	1V	
DC Current (A DC)	2000µA	1µA	±(1.2% rdg + 2d)
	200mA	100µA	±(1.5% rdg + 2d)
Resistance	200Ω	0.1Ω	±(0.8% rdg + 4d)
	2000Ω	1Ω	
	20kΩ	0.01kΩ	
	200kΩ	0.1kΩ	
	2000kΩ	1kΩ	±(1.5% rdg + 2d)
Battery Test	9V	10mV	±(1.2% rdg + 2d)

**NOTE:** Accuracy specs consist of two elements:

- (% reading): Accuracy of measurement circuit.
- (+ digits): Accuracy of analog to digital converter.

**NOTE:** Accuracy is stated at 65°F to 83°F (18°C to 28°C) and < 75% RH.

<b>Diode Test</b>	Test current of 1mA maximum, open circuit voltage 2.8V DC typical
<b>Battery Test current</b>	9V (6mA)
<b>Input Impedance</b>	1MΩ
<b>ACV Bandwidth</b>	50Hz to 60Hz
<b>DCA voltage drop</b>	200mV
<b>Display</b>	3 ½ digit, 2000 count LCD
<b>Over-range</b>	"1" is displayed
<b>Polarity</b>	Automatic (no indication for positive polarity); Minus (-) sign for negative polarity.
<b>Measurement Rate</b>	2 times per second, nominal
<b>Low Battery</b>	 is displayed
<b>Battery</b>	One 12V (VA23A, MS21) battery
<b>Fuse</b>	mA, µA ranges; 0.2A/250V fast blow
<b>Operating Temp.</b>	32°F to 122°F (0°C to 50°C)
<b>Storage Temp.</b>	-4°F to 140°F (-10°C to 60°C)
<b>Operating Humidity</b>	< 70%
<b>Storage Humidity</b>	< 80%
<b>Operating Altitude</b>	7000ft. (2000) meters maximum.
<b>Weight</b>	3.6 oz. (102g)
<b>Size</b>	4.3" x 2.1" x 1.3" (108mm x 53mm x 32mm)
<b>Safety</b>	For indoor use and in accordance with Overvoltage Category II, Pollution Degree 2. Category II includes local level, appliance, portable equipment, etc., with transient overvoltages less than Overvoltage Category III.

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