INSTRUCTION MANUAL

MT1883

Manual Ranging Multimeter

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1. Safety Instructions

The following safety information must be read and understood to insure maximum personal safety during the operation of this meter:

- Do not use the meter if the meter or test leads look damaged, or if you suspect that the meter is not operating properly.
- Never ground yourself when taking electrical measurements. Do not touch exposed metal pipes, outlets, fixture, etc., which might be at ground potential. Keep your body isolated from ground by using dry clothing, rubber shoes, rubber mats or any approved insulating material.
- Turn off power to the circuit under test before cutting, unsoldering, or breaking the circuit. Small amounts of current can be dangerous.
- Use caution when working above 60V DC or 30C AC RMS, such voltages pose a shock hazard.
- When using the probes, keep your fingers behind the finger guards on the probes.
- Measuring voltage which exceeds the limits of the multimeter may damage the meter and expose the operator to a shock hazard. Always recognize the meter voltage limits as stated on the front of the meter

Never apply voltage or current to the meter that exceeds the specified maximum:

Input Protection Limits	
Function	Maximum Input
V DC/AC	1000V DC, 700V AC
mA DC/AC	200mA
A DC/AC	20A DC/AC (30 seconds max every 15 min)
Frequency, Resistance, Capacitance, Diode Test, Continuity Temperature	250V DC/AC

1.2 Safety Symbols

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

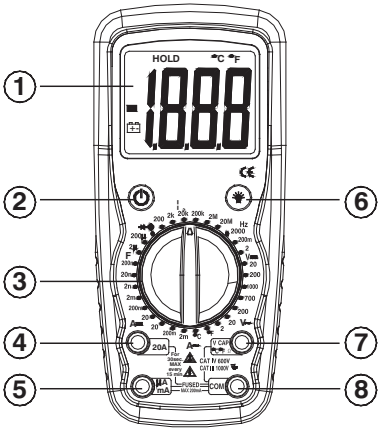
WARNING This **WARNING** symbol indicates a potentially hazardous situation, which if not avoided, could result in death or serious injury.

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

MAX 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 exceeds (in this case) 1000V AC/DC.

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

2. Panel Descriptions



1. **Large 2000 Count LCD Display -** with backlight and HOLD, °C, °F, BAT symbol signs
2. **Power ON/OFF Button**
3. **Function Switch**
4. **20A (positive) input jack -** for 20A DC/AC measurements
5. **mA input jack** - for mA DC/AC measurements
6. **Backlight Button**
7. **V / Ω / CAP / Hz / TEMP / Input Jack**
8. **COM (negative) input jack**

3. Specifications

The meter complies with:	EN61010-1
Insulation:	Class 2, Double Insulation
Overvoltage category:	CAT II 1000V
Display:	2000 count LCD Display with function indication
Polarity:	Automatic, (-) negative polarity indication
Overrange:	"OL" mark indication
Low Battery Indication:	The "  " is displayed when the battery voltage drops below the operating level.
Auto Power Off:	Meter automatically shuts down approx. 10 minutes of inactivity
Measuring Rate:	2 times per second, nominal.
Operating Environment:	0°C to 50°C (32°F to 122°F) at <70% relative humidity
Storage Temperature:	20°C to 60°C (-4°F to 140°F) at <80% relative humidity
For inside use, max height:	2000m
Pollution Degree:	2
Battery:	9V
Dimensions:	180 x 82 x 55mm
Weight:	360g

Accuracy is given at 18°C to 28°C (65°F to 83°F) less than 70% RH

DC Voltage

Range	Resolution	Accuracy
200.0mV	0.1mV	±0.5% of rdg ± 2 dgts
2.000V	1mV	
20.00V	10mV	
200.0V	100mV	
1000V	1V	±0.8% of rdg ± 2 dgts

Input impedance: 10MΩ.
200mV range maximum input: 250V DC or 250V AC RMS.
Maximum Input: 1000V DC or 700V AC RMS.

AC Voltage

Range	Resolution	Accuracy
2.000V	1mV	±1.0% of rdg ± 3 dgts
20.00V	10mV	
200.0V	100mV	
700V	1V	±1.2% of rdg ± 5 dgts

Input impedance: 10MΩ.
Frequency Range: 50 to 400Hz
Maximum Input: 1000V DC or 700V AC RMS.

DC Current

Range	Resolution	Accuracy
2.000mA	1uA	±1.0% of rdg ± 3 dgts
200.0mA	100uA	±1.5% of rdg ± 3 dgts
20.00A	10mA	±2.5% of rdg ± 10 dgts

Overload Protection: 0.2A/250V and 20A/250V fuse.
Maximum Input: 200mA DC or 200mA AC RMS on mA ranges, 20A DC or AC RMS on 20A range.

AC Current

Range	Resolution	Accuracy
2.000mA	1uA	±1.2% of rdg ± 3 dgts
200.0mA	100uA	±2.0% of rdg ± 3 dgts
20.00A	10mA	±3.0% of rdg ± 10 dgts

Overload Protection: 0.2A/250V and 20A/250V fuse.
Frequency Range: 50 to 400Hz
Maximum Input: 200mA DC or 200mA AC RMS on mA ranges, 20A DC or AC RMS on 20A range.

Resistance

Range	Resolution	Accuracy
200.0Ω	0.1Ω	±1.0% of rdg ± 4 dgts
2.000kΩ	1Ω	±1.0% of rdg ± 2 dgts
20.00kΩ	10Ω	±1.2% of rdg ± 2 dgts
200.0kΩ	100Ω	
2.000MΩ	1kΩ	
20.00MΩ	10kΩ	±2.0% of rdg ± 5 dgts

Input Protection: 250V DC or 250V AC RMS

Capacitance

Range	Resolution	Accuracy	
2.000nF	1pF	±4.0% of rdg ± 70 dgts	
20.00nF	10pF	±4.0% of rdg ± 3 dgts	
200.0nF	0.1nF		
2.000uF	1nF		
200.0uF	0.1uF	≤20uF	±4.0% of rdg ± 15 dgts
		≥21uF	unspecified

Input Protection: 250V DC or 250V AC RMS.

Frequency

Range	Resolution	Accuracy
2000Hz	1Hz	±1.5% of rdg ± 5 dgts

Sensitivity: 200mV ~ 10V RMS
Overload Protection: 250V DC or AC RMS

Temperature

Range	Resolution	Accuracy
-20°C to 760°C	1°C	±3% of rdg ±5°C/9°F
-4°F to 1400°F	1°F	

Sensor: Type-K Thermocouple
Overload Protection: 250V DC or AC RMS

Diode Test
Test Current: 1mA typical
Open Circuit Voltage: 2.8V DC typical
Overload Protection: 250V DC or AC RMS

Audible Continuity
Audible threshold: less than 50Ω; test current <0.3mA
Overload Protection: 250V DC or AC RMS

4. Operation

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

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 stabilise and give proper measurements when connected to a circuit.

4.1. Back Light Button

The back light button is used to turn the back light on only. To extend the battery life, the back light will be turned off automatically within around 3 seconds.

4.2. DC Voltage Measurements

Caution: Do not measure DC 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 V DC position (”mV” will appear on the display).
2. Insert the black test lead banana plug into the negative (COM) jack and the red test lead banana plug into the positive (V) jack.
3. Touch the test probe tips to the circuit under test. Be sure to observe the correct polarity (red lead to positive, black lead to negative).
4. Read the voltage on the display. The display will indicate the proper decimal point and value. If the polarity is reverse, the display will show (-) minus before the value.

4.3. 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 0V 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 V AC position.
2. Insert the black test lead banana plug into the negative (COM) jack and the red test lead banana plug into the positive (V) jack.
3. Touch the test probe tips to the circuit under test
4. Read the voltage on the display. The display will indicate the proper decimal point, value and symbol (AC, V, etc).

4.4. DC Current Measurements

Caution: Do not make current measurements on the 20A scale for longer than 30 seconds. Exceeding 30 seconds may cause damage to the meter and/or the test leads.

1. Insert the black test lead banana plug into the negative (COM) jack.
2. For current measurements up to 200mA DC, set the function switch to the mA range and insert the red test lead banana plug into the (mA) jack.
3. For current measurements up to 20A DC, set the function switch to the A position and insert the red test lead banana plug into the 20A 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 and the red test probe tip in series to the circuit whose current you want to measure.
6. Apply power to the circuit.
7. Read the current on the display. The display will indicate the proper decimal point value.

4.5. AC Current Measurement

Warning: To avoid electric shock, do not measure AC current on any circuit whose voltage exceeds 250V AC.

Caution: Do not make current measurements on the 20A scale for longer than 30 seconds. Exceeding 30 seconds may cause damage to the meter and/or the test leads.

1. Insert the black test lead banana plug into the negative (COM) jack.
2. For current measurements up to 200mA AC, set the function switch to the mA range and insert the red test lead banana plug into the (mA) jack.
3. For current measurements up to 20A AC, set the function switch to the A position and insert the red test lead banana plug into the 20A 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 and the red test probe tip in series to the circuit whose current you want to measure.

6. Apply power to the circuit.
7. Read the current on the display. The display will indicate the proper decimal point value.

4.6. 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 to the Ω position.
2. Insert the black test lead banana plug into the negative (COM) jack and the red test lead banana plug into the positive Ω 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 on the display. The display will indicate the proper decimal point value.

4.7. Continuity Check

Warning: To avoid electric shock, never measure continuity on circuits or wires that have voltage on them.

1. Set the function switch to the ⊣•)) position.
2. Insert the black lead banana plug into the negative jack (COM) and the red test lead banana plug into the positive jack (Ω).
3. Touch the test probe tips to the circuit or wire you wish to check.
4. If the resistance is less than approximately 50Ω, the audible signal will sound. The display will also show the actual resistance.

4.8. Diode Test

Warning: To avoid electric shock, do not test any diode that has voltage on it.

1. Set the function switch to the ⊣•)) position.
2. Insert the black lead banana plug into the negative jack (COM) and the red test lead banana plug into the positive jack (Ω).
3. Touch the test probe tips to the diode or semiconductor junction you wish to check. Note the meter reading.

4. Reverse the probe polarity by switching probe positions. Note the reading.
5. The diode or junction can be evaluated as follows:
   A. If one reading shows a value and the other reading shows "1", the diode is good.
   B. If both readings show "1", the device is open.
   C. If both readings are very small or 0, the device is shorted

NOTE: The value indicated on the display during the diode check is the forward voltage.

4.9. Frequency Measurement

1. Set the function switch to the 20KHz position.
2. Insert the black test lead banana plug into the negative jack (COM) and the red test lead banana plug into the positive jack (F).
3. Touch the test probe tips to the circuit under test.
4. Read the frequency on the display. The digital reading will indicate the proper decimal point value.

4.10. Capacitance Measurements

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

1. Set the function switch to the CAP position.
2. Inset the black test lead banana plug into the negative jack (COM) and the red test lead banana plug into the positive jack (CAP)
3. Touch the test leads to the capacitor to be tested. The display will indicate the proper decimal point value.

4.11. Temperature Measurements

Warning: To avoid electric shock, disconnect both test probes from any source of voltage before making a temperature measurement.

1. If you wish to measure temperature in °F, set the function switch to the °F range. If you wish to measure temperature in °C, set the °F/°C button to the °C range.

2. Insert the temperature probe into the negative jack (COM) and the positive jack (Temperature), making sure to observe the correct polarity.
3. Touch the temperature probe head to the part whose temperature you wish to measure. Keep the probe touching the part under test until the reading stabilises (about 30 seconds)
4. Read the temperature on the display. The digital reading will indicate the proper decimal point and value.

Warning: To avoid electric shock, be sure the thermocouple has been removed before changing to another measurement function.

5. Replacing the Battery

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

1. When the battery becomes flat or drops below the operating voltage, "BAT" will appear in the right-hand side of the LCD display. The battery should be replaced.
2. Follow instructions for installing the battery. See the battery installation section of the manual.
3. Dispose of the old battery properly

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

6. Battery Installation

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

1. Disconnect the test leads from the meter.
2. Open the battery cover by loosening the screw using a phillips head screwdriver.
3. Insert the battery into battery holder, observing the correct polarity
4. Put the battery cover back in place. Secure with the screw

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

Note: If your meter does not work properly, check the fuses and battery to make sure that they are still good and that they are properly inserted.

7. Replacing the Fuses

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

1. Disconnect the test leads from the meter and any item under test.
2. Open the back cover by loosening the screw on the back cover using a phillips head screwdriver
3. Remove the old fuse from its holder by gently pulling it out.
4. Install the new fuse into the holder.
5. Always use a fuse of the proper size and value (0.2A/250V fast blow for the 200mA range, 20A/250V fast blow for the 20A range).
6. Put the back cover on by inserting the screw and tightening it securely.

Warning: To avoid electric show, do not operate your meter until the fuse cover is in place and fastened securely.

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