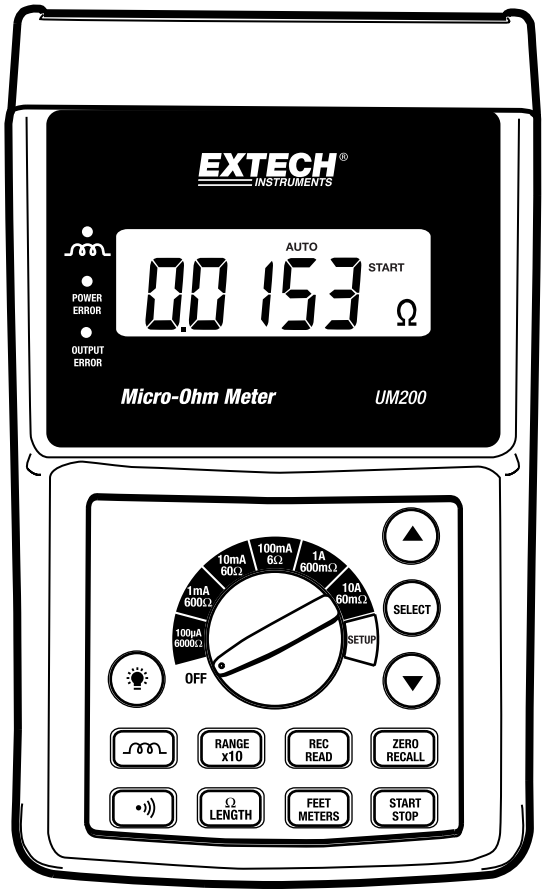
User's Guide

EXTECH® INSTRUMENTS
A FLIR COMPANY

Micro-Ohmmeter

Model UM200



WARNING

 Do not use the ohmmeter before you read the following instructions.

 Do Not Plug in the AC adapter when the ambient temperature exceeds 45℃ / 113℉ .

 Do Not charge the lithium battery when the ambient temperature exceeds 45°C / 113°F.

Warnings

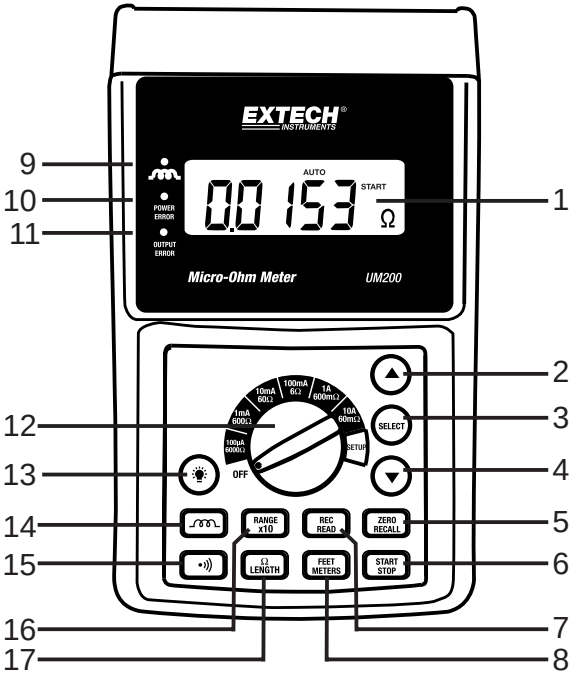
- Do not attempt to connect to or measure any resistance (object) with voltage present. Electrical potential (voltage) could cause damage to the ohmmeter.
- Do not use the lithium battery to power anything but this instrument.
- Do not soak or immerge the lithium battery in any liquid.
- The lithium battery may explode if disposed of in Fire.
- Recycled or disposed of the battery as directed by local regulations.
- Do not expose the lithium battery to temperature higher than 60°C or 140°F.
- Do not disassemble the lithium battery assembly.
- Do not short circuit the lithium battery
- Do not touch the battery if it is damaged.

Features

- High 1μΩ resolution with a basic accuracy of 0.25%.
- 10A maximum test current.
- Measurement of resistive and inductive materials.
- Four terminal Kelvin measurement.
- Manual or Auto Range. (There are 6 ranges of current measurement and 3 sub-ranges in each current range.)
- Programmable Hi-Lo alarm with memory of 20 sets of limits.
- Hold function.
- Cable length measurement (Feet or Meter).
- Memory of 3,000 measurement data.
- Large LCD (5-digit) with backlight.
- Rechargeable lithium battery (3400mAH) and built-in charging circuit.
- Low battery indication.
- Low power consumption.
- PC interface & software.

Meter Description

Front Panel



1. **LCD:** 6000 count LCD with Backlight.
2. **▲ button:** In SETUP mode, press the ▲ button to increment value by 1. Press and hold the ▲ button for over 2 seconds to increment value swiftly. In Recall mode, press the ▲ button to display the next stored data location.
3. **SELECT button:** In SETUP mode press the **SELECT** button to select HI (Limit) or LO (Limit) or display cable resistance per foot or meter
4. **▼ button:** In SETUP mode, press the ▼ button to decrement value by 1. Press and hold the ▼ button for over 2 seconds to decrement value swiftly. In Recall mode, press the ▼ button to display the previously stored data ~~data~~ location)
5. **ZERO / RECALL button:** In resistance mode, press the **ZERO / RECALL** button to enter Relative mode (the present readings will be reset to zero), or press the **ZERO / RECALL** button for over 2 seconds to exit the Relative mode. In SETUP mode, use this button to recall the pre-stored sets of HI limits, LO limits and resistance per unit.
6. **START / STOP button:** In resistance mode, press the **START / STOP** button to start measurement. Press the **START / STOP** button again to stop and hold the reading.
7. **REC / READ button:** In measurement mode, press the **REC / READ** button to display the number of the present recorded data and have the present reading recorded. In SETUP mode, press the **REC / READ** button to enter READ data mode. Press it again to exit READ data mode. In the READ mode, users can recall data stored by pressing the ▲ or ▼ button.
8. **FEET / METERS button:** In cable length mode, press the **FEET / METERS** button to select units of Meter (M) or Feet (FT).

9. **LED:** If the light is on, measurements are for both inductive and resistive materials. If the light is off, measurements are for resistive materials only.

10. **Power error LED:** If the light is on, measurement errors may be caused by one of the following reasons:

    Low battery voltage
    Blown fuse
    Measuring a device with electrical potential (voltage).
    (Note: the electrical potential (voltage) could cause damage to the meter.)

11. **Output error LED**: If the light is on, measurement errors may be caused by one of the following reasons:

    Test leads or the measured cable is not properly connected.
    Resistance is too high (higher than the measurement range)
    Output current is less than needed for the load.

12. **Rotary Switch:** The Switch provides selections of: OFF, 6 measurement ranges (6000Ω, 600Ω, 60Ω, 6Ω, 600mΩ and 60mΩ) and SETUP.

13. **button:** Press this button to enable/disable the backlight.

14. **button:** (for 600mΩ (1A) and 60mΩ (10A) ranges) Press to measure inductive materials when the LED is off.

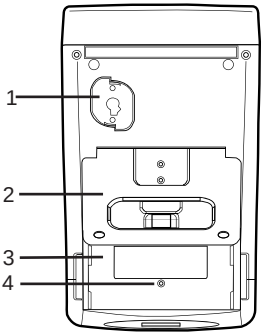
15. **button:** Press the Beep button to turn on/off the alarm function (HI and LO). When the alarm function is enabled, the icon will be shown in LCD. If the value of resistance is within the HI-LO range, a “PASS” will be displayed. If the value of resistance is out of HI-LO range, the beeper will sound. But if the value of resistance is out of the measuring range (LCD displays “OL”), the alarm function is disabled.

16. **Range x10 button:** In each rotary switch position, three sub-range can be selected by pressing this button. Press the Range x10 button for over 2 seconds to return to Auto Range. In the auto range, a symbol of AUTO will be displayed in LCD.
    In the SETUP mode, press this button to move the decimal point of a number.

17. **Ω / LENGTH button:** Press Ω / LENGTH button to select measurement mode or length mode. Press Ω / LENGTH button for over 2 seconds to store the present value of resistance as the resistance per foot or meter.

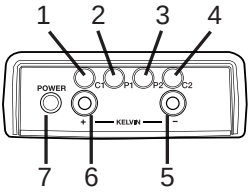
Rear Panel

1. Communication port
2. Stand.
3. Battery cover
4. Battery cover screw



Top Panel

1. C1 Alligator Clip Terminal or 4-wire Test Leads Terminal.
2. P1 Alligator Clip Terminal or 4-wire Test Leads Terminal.
3. P2 Alligator Clip Terminal or 4-wire Test Leads Terminal.
4. C2 Alligator Clip Terminal or 4-wire Test Leads Terminal.
5. - Kelvin Clip Terminal.
6. +Kelvin Clip Terminal.
7. POWER for the input of AC adaptor.



Operation

Note:

1. The battery is charged before shipment, operation when first received is permitted.
2. After the **START/STOP** button is pressed to start measurement, the unit cannot be stopped until the first measurement is completed.
3. When the LED light with inductance symbol is on, this indicates the measurement is for both resistive materials and inductive materials. When the LED light with inductance symbol is off, inductive material cannot be measured.

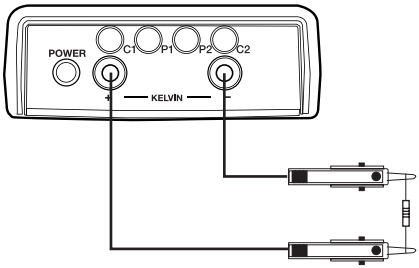
NOTE: The battery will not charge with the rotary switch in the OFF position. Place the rotary switch in any range position to charge the battery.

Warning:

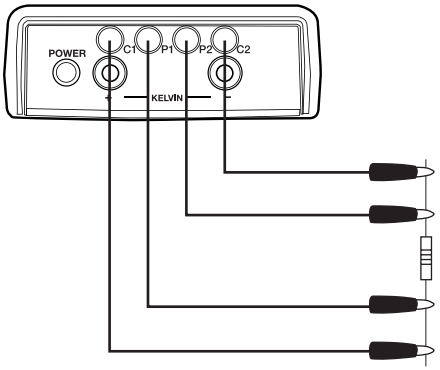
Do not measure any resistance (object) with electrical potential (voltage). The electrical potential (voltage) could cause damage to the ohmmeter.

4 Wire Connection Methods

Kelvin Clips



Alligator Clips



Resistance measurements with the LED ON (6, 60, 600 and 6000Ω ranges)

1. Connect the test leads to the meter and to the device under test.
2. Turn the switch to a proper measurement range. Five dash lines (-----) will be shown in LCD.
3. Press the **START / STOP** button to start the measurement.
4. The LCD will continuously display the value of the resistance. Both resistive and inductive materials can be measured.
5. To stop the measurement, press the **START/STOP** button again. The ▮ hold symbol will be shown in LCD and the final result will remain in the display.

Resistance measurements with the LED OFF (600, 60mΩ ranges)

Resistive Materials:

1. Connect the test leads to the meter and to the device under test.
2. Turn the switch to a proper measurement range. Five dash lines (-----) will be shown in LCD. The LED is off. The measurement is for resistive material only.
3. Press the **START / STOP** button to start the measurement.
4. The LCD will continuously display the value of the resistance. Only resistive materials can be measured.
5. To stop the measurement, press the **START/STOP** button again. The ▮ hold symbol will be shown in LCD and the final result will remain in the display..

Inductive and Resistive Materials:

1. If inductive material is to be measured (such as coil of motor or a transformer), Press the button to turn on the LED. Both resistive and inductive materials can be measured.
2. Press the **START/STOP** button to start measurement.
3. When a stable reading is obtained the measurement will automatically stop, the ▮ hold symbol will be shown in LCD and the final result will remain in the display.

Manual Range (Sub-Ranges)

There are three overlapping sub-ranges in each of the six rotary switch ranges. Each sub-range can be selected by pressing the RANGE button. Refer to the specifications for a list of the sub-ranges. The OL symbol will be shown in LCD if the value of resistance is out of sub-range. The resolution remains the same for the three sub-ranges. In the manual range, the AUTO symbol will disappear.

Alarm Function

Press the •)) button to enable the alarm function after the HI and LOW limits are set. The •)) symbol will be displayed in the LCD.
If the resistance measured falls within the range of HI and LO limits, a symbol of PASS is shown in the LCD. If not, the buzzer will beep to indicate a fail.
If the reading is OL, the alarm function is temporarily disabled until a reading is obtained.

Alarm HI, LO, or Resistance per unit Setup

1. Turn the rotary switch to **SETUP**.
2. Press the **SELECT** button to select HI limit, LO limit or Resistance per unit
3. Press the **ZERO / RECALL** button to step through existing limits (20 available) or to set a new limit.
4. Press the **SELECT** button to select a displayed limit
5. To set a new limit, press the ▲ or ▼ button to increment or decrement the displayed value. To increment or decrement value faster, press and hold the ▲ or ▼ button for over 2 seconds.
6. Press the **RANGE x10** button to move the decimal to the next position.
7. To store the modified data, the **SELECT** button.

NOTE: If the reading of resistance is "OL", the unit will not indicate PASS or beep.
The alarm function works only when the resistance is within measuring range.

NOTE: The limits of HI and LO alarms are 0.001mΩ and 999.99Ω
The limits of Resistance per unit are 0.001μΩ/ft (or m), 999.99Ω/m, 304.79Ω/ft

Cable Length Measurement

1. Prepare a 1 foot or a 1 meter long sample from the cable to be measured.
2. Select the proper range of resistance, press the **START** button and measure the resistance of the sample.
3. Press the **Ω/LENGTH** button for over 2 seconds. The meter will beep and the LCD will display units of FT or m. The measured value is stored and used to determine cable length.
4. If needed, press the **FEET/METERS** button to change the units. If the units are changed, press the **Ω/LENGTH** button for over 2 seconds again.
5. Disconnect the sample cable and connect the Kelvin clips to the cable to be measured. The LCD will display the length of the cable.
6. If "OL" appears in the display, select a higher range and press **START.**

Recalling pre-stored Ω/LENGTH data

There are up to 20 pre-stored Resistance per unit values stored into memory. These values can be recalled and used for cable length measurement.

1. In SETUP mode, press the **RECALL** button to recall pre-stored data.
2. Press the **SELECT** button until the resistance per unit values appear.
3. Press the **RECAL**L button to step through the stored values.
4. Turn the rotary switch to the proper range and press **START** to measure the cable length.

NOTE:

The range of length is 0.0001 ft or m to 9999K ft or m.
When the cable is disconnected, OL Ω is displayed instead of OL FT or m.
When the resistance is 0, 0 Ω is shown instead of 0 FT or m.
If the length is less than 0.0001 feet or meters but greater than 0, 0.0001 feet or meters is shown.

Memory Record, Read and Clear

Record

1. With a reading in the display, press the **REC / READ** button.
2. The memory location number will flash on the display and the data will be stored to that location.

Read

1. Turn the rotary switch to SETUP.
2. Press the **REC / READ** button. The memory will flash and then the data in that location will be displayed.
3. Press the ▲▼ buttons to scroll through stored data.

Clear

1. Turn the meter off.
2. Press and Hold the **REC / READ** button and simultaneously turn the meter on.

NOTE:

The memory capacity is 3000 data records. When 3000 records are exceeded, there will be a long beeping sound and no further data can be recorded..

Backlight

Press the button to turn the backlight on or off.

Battery Charging

1. The battery should be recharged when the  low battery icon appears in the display, after extended use or after a long period of storage.
2. Connect the AC Adaptor to the meter.
3. Turn the rotary switch to an ON position

NOTE: The battery will not charge with the rotary switch in the OFF position

Battery Replacement

The charging circuit is designed only for the lithium battery included with the meter. The meter should be returned to one of our repair facilities for replacement. Non-approved lithium battery could cause damage to the instrument or hazard to the users.

You, as the end user, are legally bound (**Battery ordinance**) to return all used batteries and accumulators; **disposal in the household garbage is prohibited!**

You can hand over your used batteries / accumulators at 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

Maintenance & Cleaning

1. Servicing not covered in this manual should only be performed by qualified personnel. Repairs should only be performed by qualified personnel.
2. Periodically wipe the case and cable with a damp cloth and detergent; do not use abrasives or solvents.

Specifications

General Specifications

LCD Display:	60000 count LCD with Backlight
Power Source:	Rechargeable Lithium Battery, 3400mAh (11.1V)
Battery Recharge Time:	10 hours
Battery Charge:	AC 110V or 220V input, DC 15V / 1 to 3A output Please note the polarity of the DC output
Dimensions:	10.1x6.1x2.25" (257 x 155 x 57mm)
Weight:	40.0oz / 1160g/ (Batteries included)
Operation temperature and humidity:	32°F to 122°F (0°C to 50°C), 85% RH
Storage temperature and humidity:	-4°F to 140°F (-20°C to 60°C), 75% RH

Electrical Specifications (23 °C ± 5 °C,)

Manual Range:

Range		Resolution	Accuracy
10 A	400µΩ to 4000µΩ	1 µΩ	±(0.25%±25µΩ)
	1.500mΩ to 16.000mΩ		
	5.000mΩ to 60.000mΩ		
1 A	4.00mΩ to 40.00mΩ	10µΩ	±(0.25%±250µΩ)
	15.00mΩ to 160.00mΩ		
	50.00mΩ to 600.00mΩ		
100 mA	0.0400Ω to 0.4000Ω	100µΩ	±(0.25%±2.5mΩ)
	0.1500Ω to 1.6000Ω		
	0.5000Ω to 6.0000Ω		
10 mA	0.400Ω to 4.000Ω	1 mΩ	±(0.25%±25mΩ)
	1.500Ω to 16.000Ω		
	5.000Ω to 60.000Ω		
1 mA	4.00Ω to 40.00Ω	10 mΩ	±(0.25%±250mΩ)
	15.00Ω to 160.00Ω		
	50.00Ω to 600.00Ω		
100µA	0.0400kΩ to 0.4000kΩ	100 mΩ	±(0.75%±3Ω)
	0.1500kΩ to 1.6000kΩ		
	0.5000kΩ to 6.0000kΩ		

Auto Range:

Range		Resolution	Accuracy
10A	400µΩ to 60.000mΩ	1µΩ	±(0.25%±25µΩ)
1 A	4.00mΩ to 600.00mΩ	10µΩ	±(0.25%±250µΩ)
100 mA	0.0400Ω to 6.0000Ω	100µΩ	±(0.25%±2.5mΩ)
10 mA	0.400Ω to 60.000Ω	1mΩ	±(0.25%±25mΩ)
1 mA	4.00Ω to 600.00Ω	10mΩ	±(0.25%±250mΩ)
100µA	0.0400kΩ to 6.0000kΩ	100mΩ	±(0.75%±3Ω)