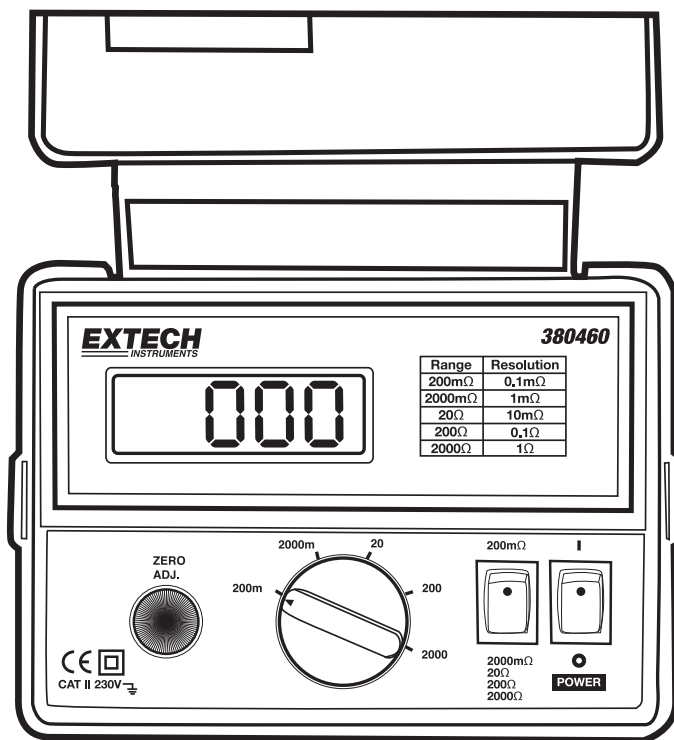




## User Guide

### Precision Milliohm Meters

### Models 380460 and 380462

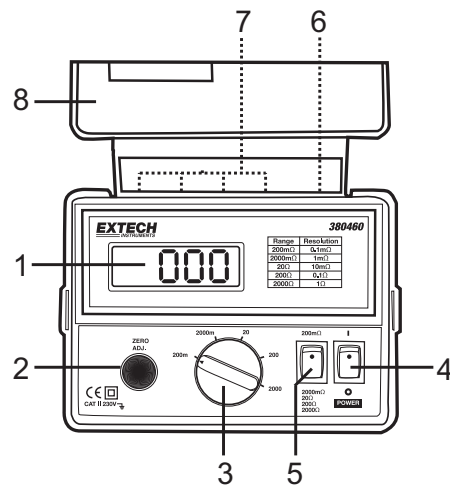


## Introduction

Congratulations on your purchase of the Extech Milliohm Meter Model 380460 (110V) or Model 380462 (220V). The milliohm meters are enclosed in rugged carrying cases for durability. Measurements are made with Kelvin test leads (supplied) for optimal accuracy in five (5) selectable ranges. Careful use of this meter will provide years of reliable service.

## Meter Description

1. LCD Display
2. Zero adjust knob
3. Range Dial
4. Power switch
5. 200m $\Omega$  select switch
6. AC power cord
7. Kelvin lead to meter connections
8. Carrying case

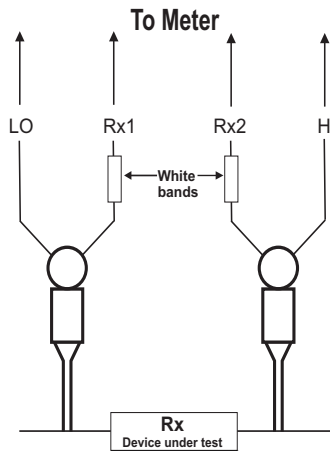


## Operation

### Basic Principles of 4-wire Measurements

For each range, the meter provides a specific amount of test current (refer to General Specifications) which flows from the HI to the LO meter terminal and therefore from the HI to the LO clip lead (Refer to the diagram). This is the current that ultimately passes through the device under test (RX in diagram below).

Once the test current is applied to the device under test, clip leads Rx1 & Rx2 measure the voltage drop across the device under test. The following equations detail how the meter accomplishes its measurement tasks.



### Measurement Equations

$$V_x = I_s \times R_x;$$

Where  $V_x$  is the voltage (measured by the meter) across the device under test;  $I_s$  is the test current;  $R_x$  is the resistance of the device under test. From  $V_x = I_s \times R_x$ , the meter moves to the next step which is:  $R_x = V_x / I_s$ . With this equation the meter determines the resistance of the device under test. Note that the measured resistance ( $R_{x1}$  &  $R_{x2}$ ) is not affected by stray resistance since the test current is supplied directly to the device under test. This is the advantage of the 4-wire Kelvin lead configuration over 2-wire methods which introduce errors into low resistance measurements.

### International Symbols

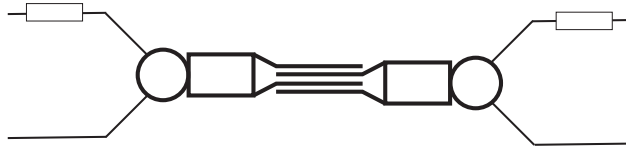
|  |                          |  |                                               |
|--|--------------------------|--|-----------------------------------------------|
|  | DC Voltage<br>DC Current |  | Refer to explanation in<br>owners manual      |
|  | AC Voltage<br>AC Current |  | Dangerous voltage risk<br>of electrical shock |
|  | Ground                   |  | Double Insulation                             |

### Powering the Meter

Connect the meter to the correct power source (110 or 220VAC); the Model 380460 uses 110VAC and the Model 380462 uses 220VAC (note that these meters are NOT interchangeable). Do not apply voltage to the meter input measurement terminals. Meter damage may result.

### Measurement Procedure

1. Rotate the Range select switch to the desired range.
2. When using the 200m range, put the 200m select switch to the 200m position; for all other measurement ranges put this switch in the opposite position
3. Perform a Zero Adjustment per the following:
  - Short the Kelvin Clips as shown in the diagram below.  
(Make sure that the clips are clean)
  - Rotate the Zero Adjust Knob until the meter indicates zero units.



4. Either attach the test leads onto a component or attach the leads between two points on a circuit.
5. Observe the meter reading.

## Specifications

### General Specifications

|                       |                                                  |
|-----------------------|--------------------------------------------------|
| Circuit               | Custom one-chip LSI microprocessor circuit       |
| Display               | 18 mm (0.7") LCD with 2000 display counts        |
| Measurement terminals | 4-Terminal Kelvin type                           |
| Measurement ranges    | Five (5) ranges (200m, 2, 20, 200, 2000Ω ohms)   |
| Zero Adjust           | ±50 count adjustment                             |
| Sampling Time         | Approximately 0.4 seconds                        |
| Over range indication | Indication of "1 "                               |
| Operating Temperature | 0 °C to 50 °C (32 °F to 122 °F)                  |
| Operating Humidity    | 80% Relative Humidity max.                       |
| Power Supply          | 110V (380460) or 220V (380462) ±15%, 50/60Hz     |
| Power Consumption     | Less than 2 VA                                   |
| Weight                | 694g (1.53 lbs.)                                 |
| Dimensions            | 167 x 122 x 85 mm (6.6 x 4.8 x 3.4") with cover  |
| Accessories           | Power Cable and 4-wire Kelvin clip leads(380465) |

### Range Specifications

| Range  | Resolution | Test Current | Accuracy           | Open Circuit Voltage |
|--------|------------|--------------|--------------------|----------------------|
| 200 mΩ | 0.1mΩ      | 100mA        | ± 0.75% + 4 digits | 4.4V                 |
| 2 Ω    | 1mΩ        | 10mA         | ± 0.75% + 2 digits | 3.6V                 |
| 20 Ω   | 10mΩ       | 10mA         | ± 0.75% + 2 digits | 3.6V                 |
| 200 Ω  | 0.1 Ω      | 1mA          | ± 0.75% + 2 digits | 3.5V                 |
| 2000 Ω | 1 Ω        | 1mA          | ± 0.75% + 2 digits | 3.5V                 |