EXTECH INSTRUMENTS

INSTRUCTION MANUAL

Models 380460 and 380462
Precision milliohm Meters

- True Kelvin connections
- 110V (380460) and 220V powered (380462) models
- Meter enclosed in rugged carrying case
- Five selectable ranges

1. INTRODUCTION

Congratulations on your purchase of Extech's Precision milliohm Meter. This professional meter, with proper care, will provide years of safe reliable service.

2. SPECIFICATIONS

2.1 General Specifications

Circuit	Custom one-chip LSI microprocessor circuit
Display	0.7" (18 mm) LCD (1999 counts)
Measurement terminals	4-Terminal Kelvin type
Measurement Range	Five ranges (200m, 2, 20, 200, 2000Ω)
Zero Adjust	±100 count adjustment
Sampling Time	Approximately 0.4 seconds
Over input indication	Indication of "1 - - -"
Operating Temperature	32 °F to 122 °F (0 °C to 50 °C)
Operating Humidity	Max. 80% RH
Power Supply	110V (380460) or 220V (380462) ±15%, 50/60Hz
Power Consumption	Less than 2 VA
Weight	1.5 lbs (680g)
Dimensions	6.3x4.72x3.35" (160 x 120 x 85 mm) with cover
Accessories	Power Cable and 4-wire Kelvin clip leads

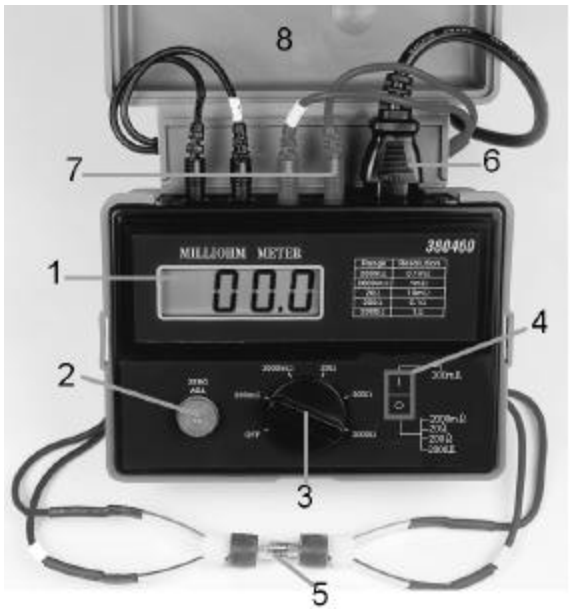
2.2 Range Specifications

Range	Resolution	Test Current	Accuracy	Open Circuit Voltage
200 mΩ	0.1mΩ	100mA	± 0.75% + 4 digits	3.8V
2 Ω	1mΩ	10mA	± 0.75% + 2 digits	3.4V
20 Ω	10mΩ	10mA	± 0.75% + 2 digits	3.4V
200 Ω	0.1 Ω	1mA	± 0.75% + 2 digits	3.2V
2000 Ω	1 Ω	1mA	± 0.75% + 2 digits	3.2V

Note: Specifications tested using RF Field Strength <3V/m and frequency <30MHz

3. FRONT PANEL DESCRIPTION

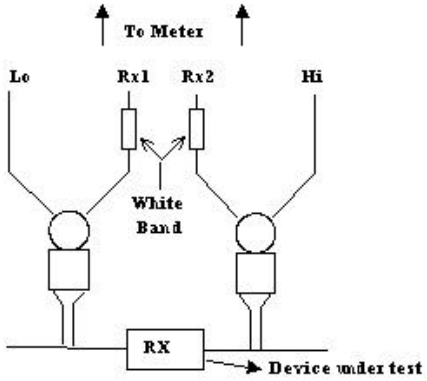
1. LCD Display
2. Zero adjust knob
3. Range select and Power switch
4. 200mΩ select switch
5. Kelvin clips
6. AC power cord
7. Kelvin lead to meter connections
8. Carrying case



4. PREPARATION FOR MEASUREMENT

4.1 BASIC PRINCIPLES OF 4-WIRE MEASUREMENTS

4.1.1 Test Current - 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 below). 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.

4.1.2 Measurement Equations:

Vx = Is x Rx; where Vx is the voltage (measured by the meter) across the device under test; Is is the test current; Rx is the resistance of the device under test. From Vx = Is x Rx, the meter moves to the next step which is: Rx = Vx/Is. With this equation the meter determines

the resistance of the device under test. Note that the measured resistance between Rx1 & Rx2 is not effected by stray resistance due to the test current being 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.

4.2 International Symbols

⎓	DC Voltage DC Current		Refer to explanation in owners manual
∿	AC Voltage AC Current		Dangerous voltage risk of electrical shock
⏚	Ground		Double Insulation

5. MEASUREMENT CONSIDERATIONS AND PRECAUTIONS

5.1 Verify that the meter is connected to the correct power source (110, 220VAC) to match the meter's configuration. Note that 110V (model 380460) and 220VAC (model 380462) powered meters are *NOT* interchangeable.

5.2 Do not apply voltage to the meter input terminals. Meter damage may result.

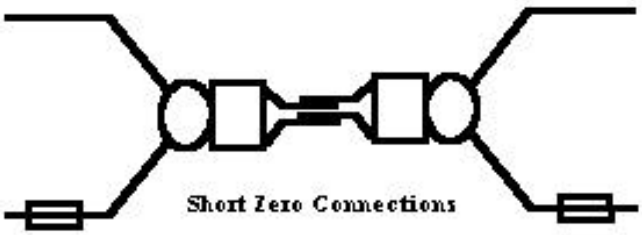
6. MEASURING PROCEDURES

6.1 Rotate the Range select switch to the 200mΩ range to prepare for zeroing. Also, select 200mΩ with the 200mΩ select switch.

6.2 Perform a Zero Adjustment per the following:

6.2.1 Short the two Kelvin Clips, see diagram below.

6.2.2 Rotate the Zero Adjust Knob until the meter indicates zero units.



6.3 Select the desired measuring range via the rotary Range select switch. When using the 200mΩ range, put the 200mΩ select switch to the 200mΩ position; for all other measurements put this switch in the opposite position. Clip the leads onto the device under test for measuring unknown resistance or between two points (such as on a PCB test).

6.4 Observe the reading.

7. CALIBRATION / REPAIR SERVICES

Extech offers complete repair and calibration services for all of the products we sell. For periodic calibration, NIST certification or repair of any Extech product, call customer service for details on services available. Extech recommends that calibration be performed on an annual basis to insure calibration integrity.

8. WARRANTY

EXTECH INSTRUMENTS CORPORATION warrants this instrument to be free of defects in parts and workmanship for one year from date of shipment (a six month limited warranty applies on sensors and cables). If it should become necessary to return the instrument for service during or beyond the warranty period, contact the Customer Service Department at (781) 890-7440 for authorization. A Return Authorization (RA) number must be issued before any product is returned to Extech. The sender is responsible for shipping charges, freight, insurance and proper packaging to prevent damage in transit.

This warranty does not apply to defects resulting from action of the user such as misuse, improper wiring, operation outside of specification, improper maintenance or repair, or unauthorized modification. Extech specifically disclaims any implied warranties or merchantability or fitness for a specific purpose and will not be liable for any direct, indirect, incidental or consequential damages. Extech's total liability is limited to repair or replacement of the product.

The warranty set forth above is inclusive and no other warranty, whether written or oral, is expressed or implied.

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