LR Series LR2000 Milliohmmeter

A Precision Low Resistance Meter

USES:

- **Production Testing of Contact Resistance of Switches, Relays, Connectors, Cables, and Other Low Resistance Devices**
- **Testing of Low Value Resistors, Fuses, Squibs, and Heating Elements**
- **Winding Resistance of Motors, Transformers, Solenoids, and Ballasts**
- **Conductivity Evaluation in Product Design**
- **Incoming Inspection and Quality Assurance Testing**

FEATURES:

- **1μΩ - 2MΩ Measurement Range**
- **1μA - 1A Constant Current**
- **0.05% Basic Measurement Accuracy**
- **Measurement Speed to 15/second**
- **Graphical LCD Display**
- **Four Terminal Kelvin Connection**
- **Automatic Zeroing**
- **Automatic Hi/Lo Comparator Limits**
- **Pass/Fail Sorting (8 Bins)**
- **Voltage Limiting for Dry Contact Testing**
- **Signal Reverse & Pulsed Current Modes**
- **Keypad Lockout**
- **Programmable Delay Times**
- **RS-232 Interface Standard**
- **IEEE & Handler Interfaces, Optional**
- **Temperature Compensation Interface, Optional**

Introduction

The LR2000 Milliohmmeter with its LCD display and menu-type front panel programming assures that low resistance measurements on switches, relays, cables, and other devices can be made quickly and easily. With a basic accuracy of 0.05% the instrument offers a wide measurement range from 1μohm to 2Mohms. For remote operation and production applications the unit comes standard with an RS-232 interface, plus IEEE-488 and handler interfaces are available as options. For measurement integrity, contact to the test device is made via a 4-terminal Kelvin connection that incorporates an automatic zeroing function to compensate for lead errors.

Description

Wide Measurement Range: Eight measurement ranges from 20mΩ to 2MΩ with constant current between 1A and 1μA. For "dry" contact measurements (those contacts whose resistance can be altered by excessive voltage potential) the LR2000 can be limited to 20mV on selected measurement ranges.

Test Signal: Besides the standard DC test signal, the LR2000 provides a signal reversal mode for eliminating thermal EMF's, and pulsed current mode for minimizing errors caused by device heating.

Precision Measurements: With a basic measurement accuracy of 0.05% the instrument can provide consistent, reliable test results.

Measurement Rate: Three measure modes of 15, 6 and 1.5 measurements per second with varying degrees of accuracy.

Pass/Fail Testing: The LR2000 has a programmable Hi/Lo comparator function in absolute value or %, as well as 8 sorting bins for categorization of components.

Zeroing: An automatic zeroing functions reduces the effects of lead resistance through the front panel 4-terminal Kelvin connection.

Interfaces: For remote control, or adaptation to a production type environment, the LR2000 includes an RS-232 interface. An optional IEEE-488 and Handler interface is also available.

Temperature Compensation: Optional interface for automatic thermal compensation measurements from 0°C-100°C with PT100 TC probe. Temperature can be displayed in °C or °F.

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Product Specifications

LR2000 Milliohmmeter

Resistance Range:

Range F.S.	Resolution	Accuracy	Test I (Typical)
20mΩ	1μΩ	±(0.1% of rdg + .006mΩ)	1A
200mΩ	10μΩ	±(0.05% of rdg + .06mΩ)	100mA
2Ω	100μΩ	±(0.05% of rdg + .6mΩ)	10mA
20Ω	1mΩ	±(0.05% of rdg + 6mΩ)	1mA
200Ω	10mΩ	±(0.05% of rdg + 40mΩ)	1mA
2kΩ	100mΩ	±(0.05% of rdg + .2Ω)	1mA
20kΩ	1Ω	±(0.1% of rdg + 2Ω)	100μA
200kΩ	10Ω	±(0.2% of rdg + 20Ω)	10μA
2MΩ	100Ω	±(0.4% of rdg + 200Ω)	1μA

Test Signal: Modes: DC+, DC-, Pulse+, Pulse-, Pulse+/- and STBY
Dry Circuit: Open Circuit Voltage <20mV for 200mΩ, 2Ω and 20Ω ranges

Measurement Rate: Fast: 15 measurements/second
Medium: 6 measurements/second
Slow: 1.5 measurements/second

Measurement Mode: Continuous or Trigger

Trigger: Internal
Manual
External (IEEE or Handler)

Delay Times: Trigger Delay: 5 - 1000ms
Measurement Delay: 0 - 100s

Ranging: Automatic or Hold Range

Zeroing: Short circuit compensation

Averaging: 1 - 10

Comparator: Hi/Lo Limits (Value or %)

Binning: Hi/Lo Limuts (8 bins in %)

Indication: Audible Alarm programmable: HI LO or OFF for Pass or Fail Result

Display: 240 by 64 dot matrix LCD display

Setup Storage: Auto recall on power-up

Lock: Keypad Lockout

Test Terminals: Front: 4 Sheathed Banana & 1 GND

Interfaces (Standard): RS-232

Interfaces (Optional): IEEE-488 & Handler,
Temp Compensation, IEEE-488 & Handler

Temperature Compensation: Optional Interface for Auto Thermal Compensation: 0°-100°C with pt100 probe
Temp Display: °C or °F
Temp Range: 0°C to 100°C
Temp Accuracy: ±(0.3% of rdg+0.8°C)
Additional Resistance Error:
0°C - 39.9°C: ±0.3%
40°C - 100°C: ±0.6%
Test Terminal: pt100 probe

Dimensions: (w x h x d): 12.5 x 4.0 x 13.5in
(312.5 x 100.0 x 337.5mm)

Weight: 10.85 lbs. (5kg) net, 15.2 lbs. (7kg) ship

Environmental: Specifications: +15°C to +35°C, 75% RH
Operating: 10°C to +40°C
Storage: 0°C to +50°C
Humidity: 10 - 90% RH
Pollution Degree 2
Installation Category II

Power:
- 90 - 125V AC
- 190 - 250V AC
- 48 - 62 Hz
- 80W max

Ordering Information

LR2000 **LR2000 Milliohmmeter**

Includes:

P/N	Description
150713	LR2000 Instruction Manual
LR2000-50	Lead Set: 4 Banana Connectors to 2 Kelvin Clips
4200-0300	AC Power Cord
520026	Power Line Fuse (1.0A 250V, SB)
520138	Power Line Fuse (0.5A 250V, SB)
	Calibration Certificate Traceable to NIST

Optional Accessories:

P/N	Description
CAL	Before & After Calibration Data
LR2000-50	Kelvin Clip Lead Set (std. with unit)
LR2000-WZD	LR2000 Virtual Front Panel Wizard
630157	LR-2000 RS-232 Cable (9 pin)
700171	IEEE-488 & Handler Interfaces
700250	Temperature Compensation Probe
700251	Temperature Compensation, IEEE-488 & Handler Interfaces

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