# 4176 PROGRAMMABLE DIGITAL μ-OHMMETER

The Valhalla Scientific *Model 4176 Programmable μ-Ohmmeter* offers super-stable low resistance measurements for hard-to-test items such as transformers, coils, shunts, and even the resistance of wire itself. With a basic accuracy of 0.04% this model allows measurements from 1μΩ to 36kΩ. The seven ranges can be activated manually or through the Auto-Range feature. For optimal accuracy, connections to the load are made via a four-wire Kelvin binding post terminal that can accept banana plugs, spade lug or wires. The instrument can be operated remotely through its talk/listen RS-232 port or through the optional IEEE and USB interface. In addition the 4176 may be used in applications where temperature compensation is a must. With just one temperature sensor (Omni Compensator), the instrument can be programmed to compensate for any temperature coefficient and to any temperature reference. The Model 4176 can also be programmed for Hi-Lo limit comparison. Three front panel LEDs allow a visual of the result and a rear panel relay closure screw terminal block can be used to implement an automated batch sorting system for components or products, operate counters, sound alarms or shut off a process. A Run/Hold function is also a standard feature of the 4176. The user can program this function as a peak hi or peak low detector. Measurements may be printed or logged and viewed in a spread sheet by using the Print/Log feature also standard with all Model 4176.

## FEATURES:

- **7 Measurement Ranges from 20mΩ to 20kΩ**
- **1μΩ Resolution on lowest range**
- **10μA - 1A Constant Current**
- **0.04% Basic Accuracy**
- **Auto-Ranging mode**
- **Measurement Speed: 45 readings/second**
- **VFD Display with adjustable intensity**
- **Four Terminal Kelvin Connection**
- **RS-232 Interface Standard**
- **USB Interface (Optional)**
- **BCD Interface (Optional)**
- **Automatic Temperature Compensation**
- **Automatic Hi-Lo Limit Comparator**
- **Run/Hold and Peak Detector**
- **Print/Log Function**


For more information on the 4176 and all Valhalla Scientific products, visit our web site at:
**www.valhallascientific.com**

Or contact us at:
**1-800-548-9806**
**1-858-457-5576**
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# 4176 Specifications

## *Range Characteristics and Accuracy*

| Range | Full Scale | Resolution | Test Current[1] | Accuracy (± % of reading ± % of range) | Temperature Coefficient[2] |
|---|---|---|---|---|---|
| 20mΩ | 20.000mΩ | 1μΩ | 1A | ±0.02 ±0.02 | ±0.002%/°C |
| .2Ω | .30000Ω | 10μΩ | 1A | ±0.02 ±0.02 | ±0.002%/°C |
| 2Ω | 3.0000Ω | 100μΩ | 100mA | ±0.02 ±0.02 | ±0.002%/°C |
| 20Ω | 30.000Ω | 1mΩ | 10mA | ±0.02 ±0.02 | ±0.002%/°C |
| 200Ω | 300.00Ω | 10mΩ | 1mA | ±0.02 ±0.02 | ±0.002%/°C |
| 2kΩ | 3.0000kΩ | 100mΩ | 100μA | ±0.02 ±0.02 | ±0.002%/°C |
| 20kΩ | 30.000kΩ | 1Ω | 10μA | ±0.02 ±0.02 | ±0.002%/°C |

## *Temperature Compensation Mode Accuracy*[3]

| Range | T<25°C (± % of reading ± % of range ± % of (25°C – T)) | T>25°C (± % of reading ± % of range ± % of (T - 25°C)) |
|---|---|---|
| 20mΩ | ±0.02 ±0.07 ±0.001 | ±0.02 ±0.07 ±0.001 |
| .2Ω | ±0.02 ±0.07 ±0.001 | ±0.02 ±0.07 ±0.001 |
| 2Ω | ±0.02 ±0.07 ±0.001 | ±0.02 ±0.07 ±0.001 |
| 20Ω | ±0.02 ±0.07 ±0.001 | ±0.02 ±0.07 ±0.001 |
| 200Ω | ±0.02 ±0.07 ±0.001 | ±0.02 ±0.07 ±0.001 |
| 2kΩ | ±0.02 ±0.07 ±0.001 | ±0.02 ±0.07 ±0.001 |
| 20kΩ | ±0.02 ±0.07 ±0.001 | ±0.02 ±0.07 ±0.001 |

## *General Specifications*

**Display Type:** 5 digits VFD

**A-to-D Conversion Rate:** 45 conversions/seconds

**Display Update:** 5 user selections (100msec, 200msec, 300msec, 400msec, 500msec)

**Overload:**

20mΩ Range: 99.95% of range

200mΩ thru 20kΩ: 119.95% of range

**Overload Indication:** flashes "OVERLOAD"

**Terminal Configuration:** Four-wire Kelvin

**Test Current Polarity:** Positive (flows High to Low)

**Test Current Compliance Voltage:** 5V minimum

**Settling Time** 300 milliseconds

## *Environmental and Power Requirements*

**Power Supply:** 115VAC or 230VAC ±10% @ 50Hz to 400Hz; 25VA max

**Operating Temperature Range:** 0°C to 50°C

**Storage Temperature Range:** -40°C to +85°C

## *Physical Specifications*

**Humidity:** 80% RH max. @ 40°C (non-condensing)

**Dimensions:** 17"(43cm) W x 11½"(29.5cm) D x 4"(10cm) H

**Weights:** .36lbs (4.7kg) NET; 15lbs (7kg) SHIPPING

[1] Test Current is ±1% absolute accuracy.
[2] Temperature coefficient specified for temperature range from 0°C to 15°C and 35°C to 50°C.
[3] T indicates the temperature in °C of the test area.

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