

# Series

# 1865 Megohmmeter/IR Tester

## High Resistance Meter

### USES:

- Production Testing of Insulation on Switches, Connectors, Cables, Printed Circuit Boards, Transformers, Motors and other Devices
- Insulation Properties of Natural and Synthetic Materials such as Oils, Plastics, Rubber or Porcelains
- Screening and Sorting of High Resistance Components
- Incoming Inspection and Quality Assurance Testing
- Product Design and Evaluation of Insulation Properties

### FEATURES:

- Measurement Range to 100T $\Omega$
- Programmable Test Voltage from 1 to 1000 V DC
- 0.5% Measurement Accuracy
- Automatic Ranging
- Programmable Test Times
- High Resolution LCD Display
- Storage of Test Setup and Results
- Automatic Zeroing of Test Leads
- Limit Entry for Pass/Fail Testing
- Direct Reading of Measured Current
- Keypad Lockout with Password Protection
- RS-232 and I/O Interfaces
- Optional IEEE-488 Interface

### Introduction

The 1865 Megohmmeter/IR tester, with digital display, is used for high accuracy measurements of insulation resistance on a wide variety of components, materials and electronic devices. Resistance values greater than 100 teraohms can be measured with a basic accuracy of 0.5% at DC voltages up to 1000V. A programmable limit makes the unit ideal for pass/fail testing in a production environment and is also adaptable for use in automated system applications with its optional IEEE-488 interface.

### Description

**Precision Measurements:** The 1865 provides resistance measurement capability over a range of 1k $\Omega$  to 100T $\Omega$  (test voltage dependent), with a basic accuracy of 0.5%. To meet the test requirements for a wide range of devices, the test voltage is fully programmable up to 1000V DC. Sensing the proper resistance measurement range is done automatically, thus eliminating setup errors: and in order to eliminate lead or fixture errors, the operator can easily initiate an automatic zeroing routine of test leads.

**Easy To Use:** The 1865's menu programming system, simple controls and indicators combine for efficiency of test and productivity. Its multi-function keypad provides the operator with an easy way to program and make measurements.

**Pass/Fail:** Measured results are automatically compared to an operator programmed limit for pass/fail testing. Pass/Fail indicator lights or a pass/fail output from the instruments I/O interface give a clear indication of the measurement results.

**Program Data Storage:** Test setup conditions and measured results can be stored in instrument memory or on 3 1/2" disk when using the extended program storage option.

**Automated Testing:** For automated system applications, the instrument includes an I/O interface connection with remote start and pass/fail outputs. An optional IEEE-488 interface is also available (or added later) which enables the 1865 to be used under computer control.

**Current Display Mode:** Besides a readout of insulation resistance in ohms, the operator can select a display mode for reading the measured current directly.

**Safety Features:** The 1865 provides safety features such as current limiting, a warning indicator when high voltage is active, and safety interlock, all for protection of the operator.

**Component Test Fixture:** An accessory fixture is available for use with the 1865 which accommodates a variety of component types, including radial, axial, and chip components. Its shielded case reduces electrical noise and interference and includes a cover interlock switch and remote start for maximum operator safety.



For more detailed specifications,  
visit  
[www.quadtech.com](http://www.quadtech.com)

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1-800-253-1230  
Fax 1-978-461-4295  
Intl. 1-978-461-2100



## 1865 Megohmmeter

Resistance Range: 7 ranges (automatic or manual)  
 $1 \times 10^3 \Omega$  to  $>1 \times 10^{14} \Omega$  (voltage dependent)  
 $1 \times 10^6 \Omega$  to  $>1 \times 10^{14} \Omega$  at 1000V DC  
 $1 \times 10^5 \Omega$  to  $1 \times 10^{13} \Omega$  at 100V DC  
 $1 \times 10^4 \Omega$  to  $1 \times 10^{12} \Omega$  at 10V DC  
 $1 \times 10^3 \Omega$  to  $1 \times 10^{11} \Omega$  at 1V DC

Resistance Accuracy:  $\pm [0.45\% + \{(Rx/Vx)(0.0005 FS + 2pA) + 30 \Omega / Rx\}100\%]$   
 Rx: Measured resistance in ohms  
 Vx: Programmed voltage in volts  
 FS: Full scale current range in amperes

Voltage Range: 1 to 1000 volts programmable in two ranges

Voltage Accuracy: 1 - 100V: 1% of setting + 1V, 25mV resolution  
 100 - 1000V: 1% of setting + 2V, 250mV resolution

Output Voltage Impedance:  $1k\Omega, \pm 5\%$

Current Limited:  $< 2mA$

Current Measure:  $1 \times 10^{-13} - 1 \times 10^{-3}A$

Current\* Accuracy: 1nA- 1mA  $\pm [0.5\% + (0.0005FS + 2 pA)]$   
 100pA- 1nA  $\pm [1\% + (0.0005FS + 2pA)]$   
 1pA - 100pA  $\pm [10\% + (0.0005FS + 2 pA)]$   
 \*Specified at front panel connectors

Input Impedance:  $5k\Omega, \pm 5\%$

Measure Limits: Pass/Fail (1 limit)

Display:   
 • LCD graphics display  
 • Voltage warning indicator  
 • Pass/Fail indicator

Test Cycle: Manual: Charge, Measure, Discharge  
 Automatic:  
 Charge: (0 - 300 sec), Measure: (0 - 999 sec)  
 Dwell: (0 - 300 sec), Discharge: (0 - 300 sec)

Interfaces: Standard: RS-232, I/O Port (w/safety interlock)  
 Optional: IEEE-488 & Data/ Program Storage 3 1/2" disk

Input Terminals: Four sheathed banana jacks, front or rear (optional) mount  
 • + unknown (red) • guard (blue)  
 • - unknown (black) • ground (green)

Other Features:   
 • Menu Programming • Stop on Pass  
 • Automatic Zeroing • Safety Interlock  
 • Stored Test Conditions • Keypad Lockout  
 • Measurement units (engineering or scientific)  
 • Measurement averaging (1 - 400)

Dimensions: Benchtop unit with tilt back bail  
 (w x h x d) : (17.5 x 5.25 x 16in)  
 (444.5 x 133.4 x 406.4mm)

Weight: 18 lbs (8.2kg) - Net  
 26 lbs (11.8kg) - Shipping

Power: 90 to 250V,  
 47 or 63 Hz  
 60W max

Environmental: In accordance with MIL-T-28800D,  
 Type 3, Class 5, Style E & F  
 Operating: 0°C to +50°C,  
 Storage: -40°C to +70°C



1865-51 Shielded Lead Set (optional accessory)



1865-52 Component Test Fixture (optional accessory)

### 1865-52 Component Test Fixture

Components Accomodated:   
 Leaded Module: Body Size < 1inch  
 Lead Size < 1.4mm dia  
 SMD Module: Width: 0.5 to 10mm  
 Height: 0.5 to 10mm  
 (Diameter 0.5 to 3.0mm)  
 Length: 0.1 to 8mm  
 Alligator Clips: < 5mm diameter  
 Dimensions: (w x h x d): (8 x 5.5 x 9in), (203 x 140 x 230mm)  
 Weight: 5 lbs (2.3kg) - Net, 9 lbs (4kg) - Shipping

## Ordering Information

### 1865-00 Megohmmeter/IR Tester

**Includes:**

150073 Instruction Manual  
 XX Calibration Certificate Traceable to NIST  
 700070 AC Power Cable  
 800014 100kΩ Capacitor Adaptor  
 800015 1MΩ Capacitor Adaptor  
 520049 Spare T2.5A, 250V Power Line Fuse

**Optional Accessories:**

1865-01 IEEE Interface Option (factory installed)  
 1865-02 Data/Extended Program Storage Option (factory installed)  
 1865-03 Rear Panel Input Option (factory installed)  
 1865-50 Rack Mount Kit  
 1865-51 Shielded Lead Set  
 1865-52 Component Test Fixture  
 1865-70 IEEE Interface Option (field retrofit)  
 Calibration Data

For more detailed specifications, visit [www.quadtech.com](http://www.quadtech.com)

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