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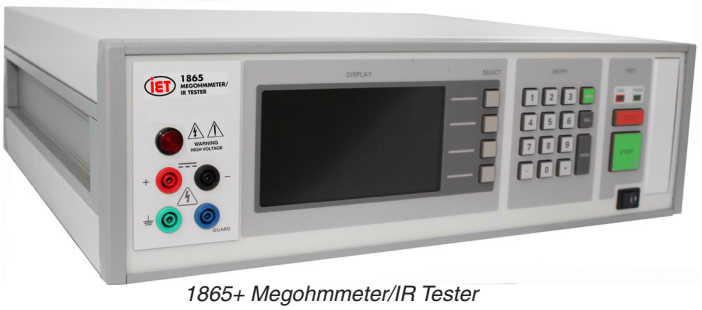
1865+ Megohmmeter/IR Tester

A Megohmmeter/IR Tester with digital display used for high-accuracy measurements of high resistance and insulation resistance. It includes a programmable limit for pass/fail testing, USB interface, and an optional IEEE-488 interface.



1865+ Megohmmeter/IR Tester

General Features

- Proven over many years in the field
- Measurement range up to 100 TΩ
- 0.5% measurement accuracy
- High-visibility blue LCD graphical display
- Automatic ranging
- Automatic zeroing of test leads
- Direct reading of measurement current
- RS-232, I/O port, and USB interfaces
- Optional IEEE-488 interface

Programmable Features

- Programmable test voltage from 1 to 1000 Vdc
- Programmable test times
- 512 MB of internal storage of test-setup and results
- CSV format for easy use with Microsoft Excel
- Limit entry for Pass/Fail testing
- Keypad lockout with password protection

DESCRIPTION

Precision measurements:

The 1865+ provides resistance measurement capability over a range of 1 kΩ to 100 TΩ (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 1000 Vdc. Sensing the proper resistance measurement range is done automatically, eliminating setup errors. The operator can initiate an automatic test leads zeroing routine in order to eliminate lead or fixture errors.

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 instrument's I/O interface give a clear indication of the measurement results.

Program data storage:

Test setup conditions and measured results can be stored in CSV format for easy use with Microsoft Excel. Storage options include:

- 512 MB of internal instrument memory,
- A computer (via the IEEE interface)
- A flash drive (via the USB port)

New programs can also be uploaded via the IEEE interface or the USB port.

Automated testing:

For automated system applications, the 1865+ includes an I/O interface connection with remote start and pass/fail outputs. An optional IEEE-488 interface is also available (or can be added later), which enables the 1865 to be remotely controlled by a computer.

Display mode (Resistance or Current):

The operator may select display mode to read either measured resistance or measured current.

Safety features

For protection of the operator, the 1865+ provides safety features such as current limiting, a safety interlock, and a warning indicator when high voltage is active.

OPTIONAL ACCESSORIES

IEEE Interface (1865-01):

Enables the 1865+ to be remotely controlled by a computer.

Rear Panel Input (1865-03):

Rear input is available as an alternative to front input. This option places the banana jacks on the rear panel.

Rack Mount Kit (1865-50):

This kit allows the 1865 unit to be installed in a standard 19" rack mount fixture.

Shielded Lead Set (1865-51):

This set is available to reduce external noise during the calibration.

Component Test Fixture (1865-52):

An accessory fixture 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.

IEEE Interface Retrofit Kit (1865-70):

This kit is available for the user to install in an existing 1865. It enables the unit to be remotely controlled by a computer.

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SPECIFICATIONS

Resistance range:
1 kΩ (10^3 Ω) to >100 TΩ (10^{14} Ω)

No of ranges:
7 manually settable plus auto-ranging

Resistance range for set voltage

Voltage Setting	Rmin	Rmax
1 Vdc	1 MΩ (10^6 Ω)	100 GΩ (10^{11} Ω)
10 Vdc	100 kΩ (10^5 Ω)	1 TΩ (10^{12} Ω)
100 Vdc	10 kΩ (10^4 Ω)	10 TΩ (10^{13} Ω)
1000 Vdc	1 kΩ (10^3 Ω)	>100 TΩ (10^{14} Ω)

Voltage range:
1 to 1,000 volts, programmable in two ranges

Voltage accuracy at front panel connectors:
1 - 100 V: 1% of setting + 1%
Resolution: 25 mV
100 - 1,000 V: 1% of setting + 2 %
Resolution: 250 mV

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

Measuring current:
0.1 pA (10^{-13} A) to 1 mA (10^{-3} A)

Current accuracy at front panel connectors:
1 nA to 1 mA ±[0.5% + (0.0005 FS + 2 pA)]
100 pA to 1 nA ±[1% + (0.0005 FS + 2 pA)]
1 pA to 100 pA ±[10% + (0.0005 FS + 2 pA)]

Short-circuit current:
<2 mA

Input impedance:
5 kΩ, ±5%

Output voltage impedance:
1 kΩ, ±5%

Test cycle:
Manual: Charge, Measure, Discharge
Automatic: Charge time: 0 - 300 seconds
Dwell time: 0 - 300 seconds
Measure time: 0 - 999 seconds
Discharge time: 0 - 300 seconds

Measurement limits:
Pass/Fail (1 limit)

Interfaces:
Standard: RS-232, I/O port with safety interlock
Optional: IEEE-488 & Data/Program storage via USB port

Input terminals:
Four sheathed banana jacks, front-mounted (with optional rear-mounting)
+ unknown (red)
- unknown (black)
guard (blue)
ground (green)

Additional features:
- Fully programmable via on-screen menu
- Internal zeroing
- 512 MB of internal memory for storing test conditions and results
- Measurement averaging (1-400 readings)
- Stop on pass
- Safety interlock
- Keypad lockout

Power:
- 90 - 250 V
- 47 - 63 Hz
- 40 W max

Display:
LCD graphic display
High-Voltage warning indicator
Pass/Fail indicator

Environmental conditions:
Operating temperature: 0ºC to 50ºC, <45% RH
Storage temperature: -40ºC to 70ºC
Altitude: < 2000 m

ORDERING INFORMATION

1865+ Megohmmeter/IR Tester
Includes:
- Instruction manual
- Calibration certificate traceable to NIST
- AC power cable
- 100 kΩ capacitor current-limiting adaptor
- 1 MΩ capacitor current-limiting adaptor
- Spare T2.5A, 250 V power line fuse

Optional Accessories
- 1865-01 IEEE interface (factory-installed)
- 1865-03 Rear panel input (factory installed)
- 1865-50 Rack mount kit
- 1865-51 Shielded lead set
- 1865-52 Component test fixture
- 1865-70 IEEE Interface Retrofit Kit
- Calibration data

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