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Turnkey Laboratories Solutions

Analytical®
Technologies Limited

Probe - 3200

Probe Conductivity Meter

EPCC / PRODUCTS / APPLICATION / SOFTWARE / ACCESSORIES / CONSUMABLES / SERVICES

Analytical Technologies Limited

An ISO 9001 Certified Company

www.analyticalgroup.net

What is a Four-Point Probe?

Analytical Technologies Probe Conductivity Meter is the most commonly-used piece of equipment for measuring the sheet resistance of a material. Sheet resistance is the resistivity of a material divided by its thickness, and represents the lateral resistance through a thin square of conducting/semiconducting material. This measurement uses four probes arrayed in a line, with equal spacing between each probe. A current is passed between the outer two probes, causing a reduction in voltage between the inner two probes. By measuring this change in voltage, the sheet resistance can then be calculated.

Key Features

Wide Current Range

Analytical Technologies Probe Conductivity Meter is capable of delivering currents between 1 µA and 200 mA, and can measure voltages from as low as 100 µV up to 10 V. The system can measure sheet resistances in the range of 100 mΩ/□ to 10 MΩ/□, enabling the characterisation of a wide range of materials.

High Accuracy

Positive and negative polarity measurements can be performed using the PC software. This enables you to calculate the average sheet resistance between positive and negative currents - eliminating any voltage offsets that may have occurred, hence increasing the accuracy of your measurements.

Easy-to-Use

Just plug in the system, install the software, and you're ready to go! The intuitive interface and clean design makes the four-point probe easy-to-use, simplifying the measurement of sheet resistance. Substrates of various shapes and sizes can be used.

Non-Destructive Testing

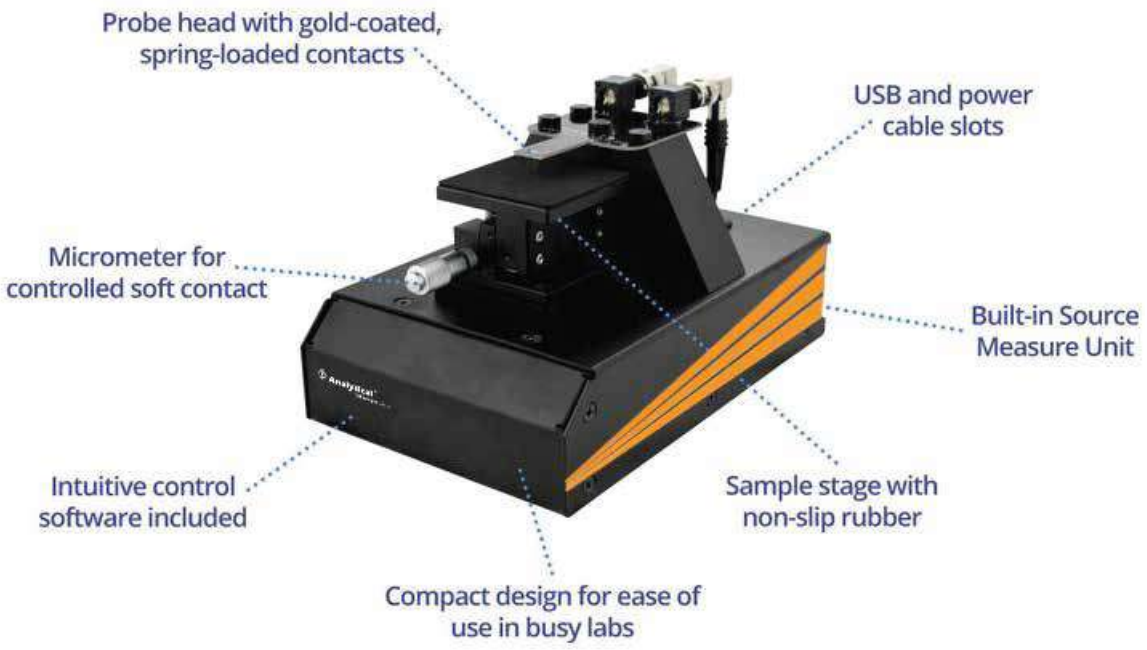
Designed with the measurement of delicate samples in mind, the four-point probe head utilises gold-plated, gentle spring-loaded contacts with rounded tips. This results in a constant contact force of 60 grams, preventing the probes from piercing fragile thin films, whilst still providing good electrical contact.

Space-Saving Design

Through careful design consideration, we have been able to keep the foot-print of the four-point probe to a min-imum (total bench area of 14.5 cm x 24 cm), allowing it to be used even in busy labs where shelf space is lacking.

Rapid Material Characterisation

The PC software (included with the system) performs all the necessary measurements and calculations for sheet resistance, resistivity, and con-ductivity - making material character-isation effortless. It also automatically performs correction factor calcula-tion.



Applications

Sheet resistance is an important property of materials, which is commonly used in material characterisation and in the development of thin-film devices such as perovskite solar cells or organic LEDs.

Material Characterisation

Resistivity is an inherent characteristic of a material, and an important electrical property. It can be determined by measuring the sheet resistance of a thin film with a known thickness, making the four-point probe measurement a key technique for the electrical characterisation of materials.

Easy-to-Use

Thin-film devices require thin conducting electrodes that transport electrical charge laterally to be extracted, so materials with low sheet resistances are required to reduce potential losses. This becomes even more important when attempting to scale up these devices, as the electrical charges must travel further along the electrodes before they can be extracted.

Please note, this system is not suitable for silicon or other materials which naturally form insulating oxide layers. To measure such materials, the oxide layer needs to be penetrated by the probes, which may not be possible with the spring-loaded, round tipped probes utilised by this

The Four-Point Probe Unit

Built-in Source Measure Unit

Four-Point Probe is powered by our Source Measure Unit. Supplied with a 24 V / 2 A power adapter and USB-B cable.

Analytical Technologies Probe Conductivity Meter

Providing a constant contact force of 60 grams, the spring-loaded four point probe head is perfect for delicate samples. The probes are gold-plated to ensure good electrical contact is made without excess force, and are rounded to further prevent them from causing damage to thin films and other fragile samples (note that they are not suitable for silicon or other materials with insulating oxide layers).

Linear translation stage

With micrometer height control and a sample stage with non-slip rubber.

Technical Specifications

Analytical Technologies Probe Conductivity Meter Specifications

Voltage range	±100 µV to ±10 V
Current range	±1 µA to ±200 mA
Sheet resistance range	100 mΩ/□ to 10 MΩ/□ (ohms per square)

Sheet Resistance	Accuracy*	Precision**	Measured at Range
100 mΩ/□	±8%	±3%	200 mA
1 Ω/□	±2%	±0.5%	200 mA
10 Ω/□	±1%	±0.5%	200 mA
100 Ω/□	±1%	±0.05%	20 mA
1 kΩ/□	±1%	±0.03%	20 mA
10 kΩ/□	±1%	±0.02%	2000 µA
100 kΩ/□	±2%	±0.05%	200 µA
1 MΩ/□	±8%	±0.5%	20 µA
10 MΩ/□	±30%	±5%	20 µA

*Accuracy is the maximum deviation from the true value.

** Precision is the maximum deviation between identical measurements (useful for comparative measurements).

Physical Device Specifications

Probe Spacing	1.27 mm
Rectangular Sample Size Range	Long Edge Minimum: 5 mm Short Edge Maxmum: 60 mm
Circular Sample Size Range (Diameter)	5 mm to 76.2 mm
Maximum Sample Thickness	10 mm
Overall Dimensions	Width: 145 mm Height: 150 mm Depth: 240

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About Analytical Technologies

Analytical Technologies is synonymous for offering technologies for doing analysis and is the Fastest Growing Global Brand having presence in at least 96 countries across the global. Analytical Technologies Limited is an ISO:9001 Certified Company engaged in Designing, Manufaturing, Marketing & providing Services for the Analytical, Chromatography, Spectroscopy, Bio Technology, Bio Medical, Clinical Diagnostics, Material Science & General Laboratory Instrumentation. Analytical Technologies, India has across the Country operations with at least 4 Regional Offices, 6 Branch Offices & Service Centers. Distributors & Channel partners worldwide.

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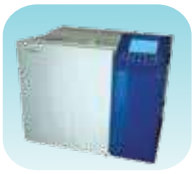

Optima Gas Chromatograph 2979 Plus

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Total Organic Carbon 3800

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NOVA-2100 Chemistry Analyzer

PCR/Gradient PCR/ RTPCR

TOC Analyzer

Laser Particle Size Analyzer

Ion Chromatograph

Water purification system

Regulatory compliances

Corporate Social Responsibility

Analytical Foundation is a nonprofit organization (NGO) found for the purpose of:

1.Research & Innovation Scientist's awards/QC Professional Award : Quality life is possible by innovation only and the innovation is possible by research only, hence ANALYTICAL FOUNDATION is committed to identify such personallities for their contributions across various field of Science and Technology and awarding them yearly. To participate for award, send us your details of research / testing / publication at Info@analyticalfoundation.org

2. Improving quality of life by offering YOGA Training courses, Work shops/Seminars etc.

3. ANALYTICAL FOUNDATION aims to DETOXIFY human minds,souls and body by means of yoga, Meditation, Ayurveda, Health Care, Awards, Media, Events, Camps etc.

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