Soft ResiScope™ Advanced Electrical Measurements for Delicate Samples

Soft ResiScope represents a breakthrough in electrical measurement technology for Atomic Force Microscopy (AFM). This innovative module for the Nano-Observer II AFM offers true quantitative resistance and current measurements on soft and fragile conductive samples, combining the benefits of intermittent contact modes with the precision of ResiScope measurements.



Key Features and Advantages

- Non-Destructive Measurements: Ideal for fragile and soft conductive samples, preserving both sample and tip integrity.
- Wide Measurement Range: Measures resistance from 10² to 10¹² ohms, maintaining the extensive capabilities of standard ResiScope.
- Friction-Free Operation: Prevents sample damage and tip wear, crucial for delicate materials.
- **Constant Force Measurements:** Ensures quantitative and reproducible electrical characterization.
- Intermittent Contact Principle: Optimizes electrical measurement while minimizing sample interaction.
- Versatile Compatibility: Works with various sample types, from organic materials to biological specimens.

Comparison with Traditional Methods

Soft ResiScope overcomes limitations of both contact and oscillating modes:

- Prevents surface damage common in contact mode
- Achieves quantitative measurements not possible with standard oscillating modes
- Provides consistent results across various sample types



-Standard ResiScope Contact Mode

PMMA sample, (soft sample)

Advanced Capabilities

- **Quantitative Measurements:** Provides results comparable to standard contact mode ResiScope on conventional samples.
- High Lateral Resolution: Maintains detailed imaging capabilities while ensuring sample preservation.
- Simultaneous Data Acquisition: Captures topography and electrical properties in a single pass.

Soft ResiScope Operation:



- 1. The tip approaches the sample surface
- 2. Brief, controlled contact is made with constant force
- 3. Precise resistance and current measurements are taken
- 4. The tip retracts and moves to the next point
- 5. This cycle repeats to create a comprehensive electrical property map

Scientifi

Application fields & Results

In the 5 µm Soft ResiScope[™] scan of an ultrathin granular gold layer evaporated on a doped-Si substrate, the topography appears relatively standard and uniform. However, the Soft ResiScope resistance signal reveals distinct variations across the surface, indicating areas with differing electrical properties.







Nanotubes 10x10µm scan



P3HT (Organic PV cell) 3x3 µm scan

