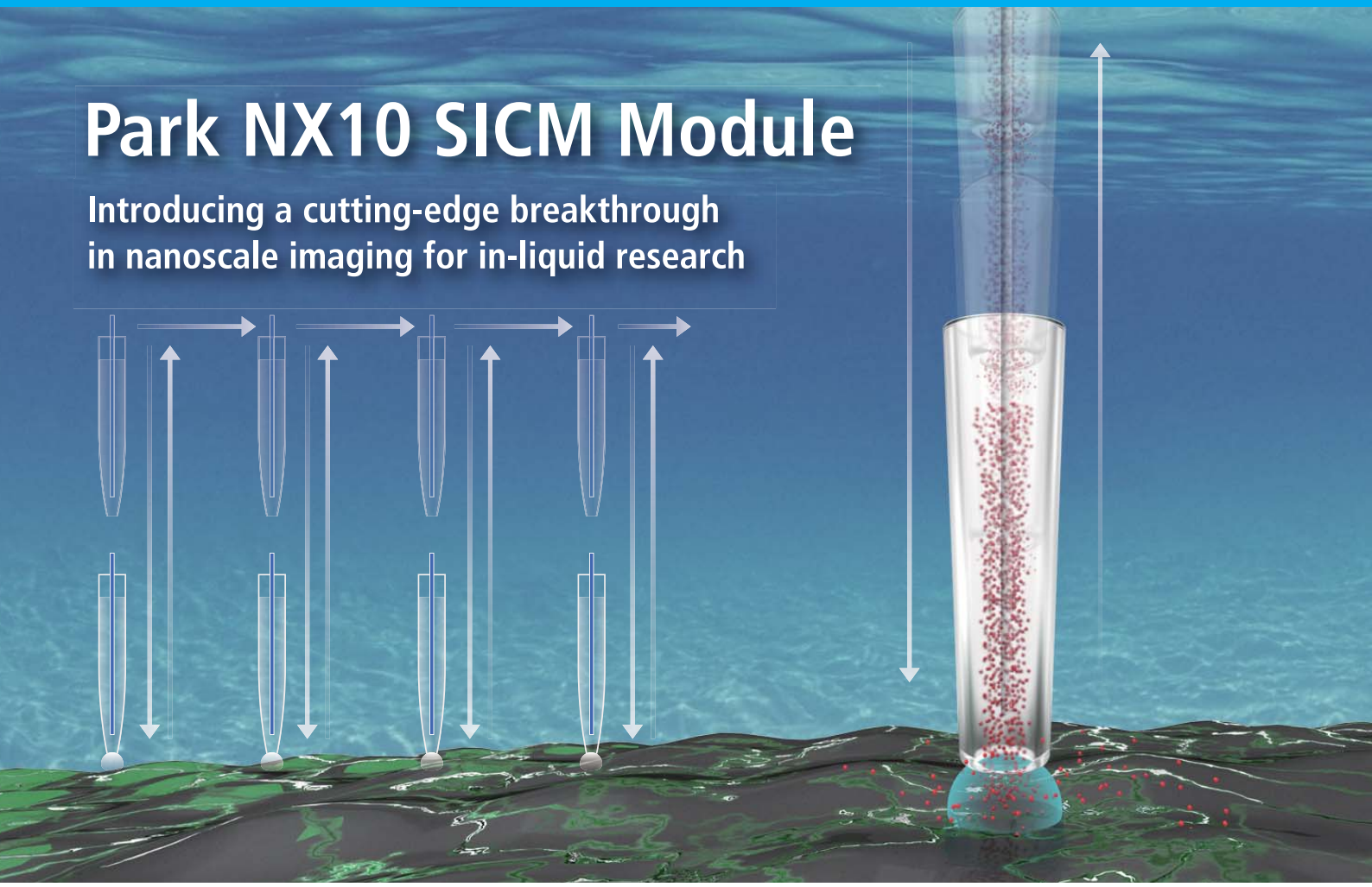
# Park NX10 SICM Module

## Introducing a cutting-edge breakthrough in nanoscale imaging for in-liquid research



**The new standard for nanoscale imaging in aqueous environments**

## Park NX10 SICM provides nanoscale imaging for a wide range of applications:

1. **Cell Biology**
   Cell morphology imaging, nano biopsy and injection
2. **Analytical Chemistry**
   Electrochemical reaction imaging by integration of scanning electrochemical microscopy
3. **Electrophysiology**
   Ion channel detection together with patch clamping
4. **Neuroscience**
   High resolution imaging of single neuron integrated with patch clamping

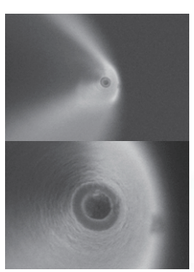
Park SYSTEMS

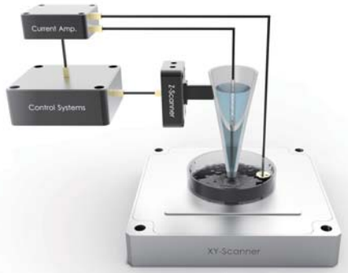
www.parksystems.com

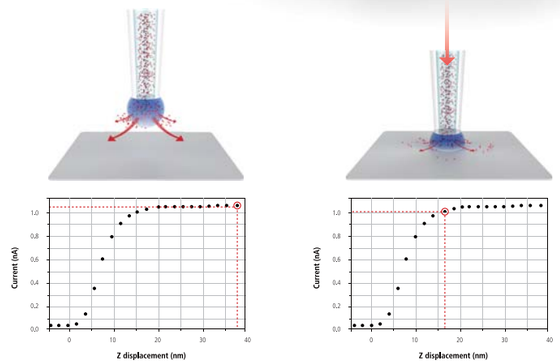
# Park SICM Technology

## Incredibly Non-invasive and Easy-to-use In-liquid Imaging

### 1 Truly non-invasive in-liquid imaging with SICM









#### Park SICM uses nanopipettes

In Scanning Ion Conductance Microscopy developed by Park Systems (Park SICM), a glass nanopipette filled with an electrolyte acts as an ion sensor that provides feedback on its location relative to a sample completely immersed in liquid. The pipette tip maintains its distance from the sample by keeping the ionic current constant. In comparison, AFM typically relies on interaction of forces between its probe tip and the sample. The pipette has an inner diameter about 100 nanometers, made of glass.

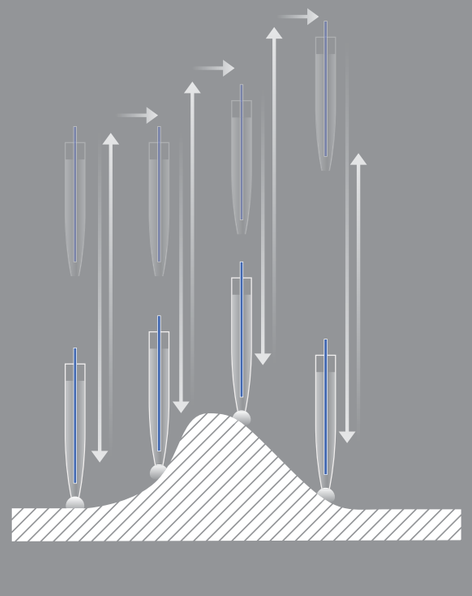
#### No Force, Non-Contact imaging in Liquid

Similar to Scanning Tunneling Microscopy (STM) operating in ambient air, the Park SICM operates in liquid without making physical contact with the sample. Electrodes on either side of the sample and pipette produce ionic current that flows through the surrounding solution. A sensor measures the current flow, which decreases as the distance between the pipette and sample becomes smaller, and monitors the distance between the pipette and the sample to obtain the topology.



#### Simple setup and operation

The SICM head can be easily added to Park NX10 platform by sliding it into a dovetail rail. This auto-engages a head connection that allows users to fully control device electronics, making setup and operation fast and simple. With the addition of two electrodes connecting to the pipette and sample buffer, researchers can generate and acquire ionic current signal through the pipette's openings. Furthermore, a vertically aligned motorized z stage allows users to easily adjust the pipette's height positioning.



### 2 Our dedicated auto-imaging software makes scanning easier and more accurate

#### a Automation for easier scanning

Streamline research and increase productivity with ARS (approach- retract-scan) free from parameter controls, so you have less to worry about while scanning.

#### b Steady pipette probe-sample distance control in nanoscale

By automatically refreshing its reference value before approaching each pixel, the stopping height of the pipette near the sample surface is not influenced by set-point drift.

## Park NX10 SICM Module

The integration of the SICM and Park NX10 AFM system from Park Systems allows researchers to expand the depth of their research and easily perform nanoscale imaging in aqueous environments.

#### High speed Z-scanner with 15 μm scan range

Driven by a high-force piezoelectric stack and guided by a flexure structure, the standard Z-scanner has a high resonant frequency of more than 9 kHz.

#### Low noise Z position sensors

The industry leading low noise Z detector enables Park SICM to capture nanometer size feature of sample providing nano-scale precision of sample topography recording. This produces highly accurate sample topography, no edge overshoot and no need for calibration.

#### Low ionic current noise level of Park internal current amplifier

The internal current amplifier of the Park SICM provides the optimized current signal processing environment for accurately recording pico-ampere current signal of SICM feedback.

## Faraday cage for stable SICM operation

Designed exclusively for Park NX10 SICM platform, the faraday cage effectively protects the pipette, head, and XY scanner from interference, providing a more stable scan environment. The transparent conductive mesh blocks electric fields and shields external static or non-static electromagnetic field of 50/60 Hz, while still allowing researchers to maintain a clear view of the pipette and sample.

## The Park NX10 SICM Module can help researchers:

1. **Protect sample integrity -** Non-invasive morphology imaging in liquids
2. **Make finer adjustments -** Nanometer resolution positioning of Nano/micro-pipette and pipette probe-sample distance control in nanoscale
3. **Take more accurate readings -** Current-distance spectroscopy and mapping
4. **Expand their capabilities -** Open platform for easy integration with other systems

## Park NX10 SICM Module Specifications

### SICM Head with pipette probe holder

- Includes a low-noise, high-precision ionic current amplifier
- Includes a high-force Z-scanner
- Flexure-guided structure driven by multiply-stacked piezoelectric stacks
- Z-scanner range: 15 μm
- 20-bit Z position control and 24-bit Z position sensor
- Dovetail lock head mount for easy mount/removal of the SICM head
- Automatically connects to the electronics upon mounting

### Supported Modes

- SICM Standard Imaging
- DC (direct current) mode, ARS (apporach-retract-scan) mode
- SICM Ionic Current Measurement

If you want to learn more about **Park NX10 SICM**, please visit us at www.parkafm.com or contact one of our representatives today.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***Please consult ParkSystems for details**
**Note:** All specifications are subject to change without notice.
Please visit our website for the most up-to-date specifications.
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*Enabling Nanoscale Advances*

Park SYSTEMS
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