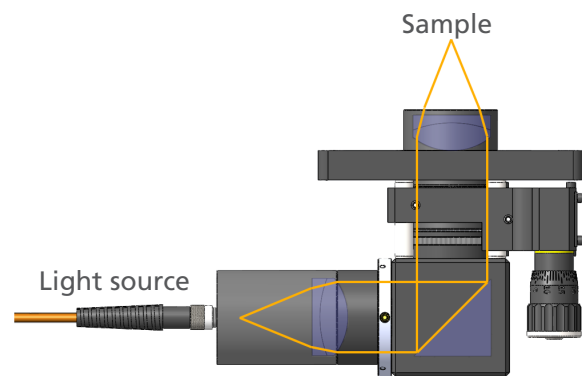
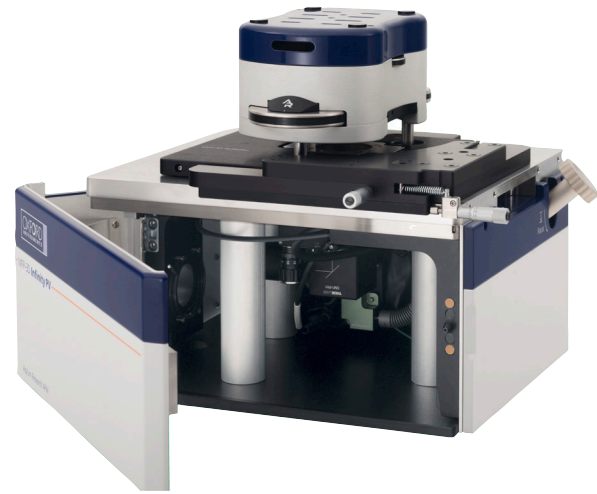


Photovoltaic Option for the MFP-3D Infinity AFM

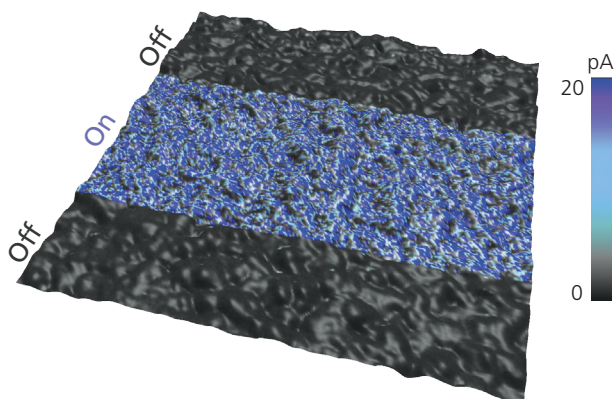
The Asylum Research Photovoltaic (PV) option for the MFP-3D Infinity AFM enables high resolution electrical characterization with simultaneous customizable bottom-side sample illumination. The PV option gives investigators a turnkey, flexible and cost-effective solution that can be used with a multitude of electrical characterization techniques and environmental control accessories found exclusively on the MFP-3D Infinity AFM.

Exquisite control, flexibility and simple operation right out of the box

- Open modular optical design, based on standard Thor Labs components, allows filters, polarizers and apertures to be added or switched easily.
- Design avoids extraneous glass and associated light loss found in systems built around inverted light microscopes.
- Standard LED-based illuminator is fiber-coupled to the base. Software control allows exquisite intensity control in 1% increments to >1 Sun.
- Easily accommodates other external light sources (e.g., Solar Simulators, Hg/Xe lamps) using commercially-available adapter plates to enable the use of a variety of light guides.
- Adjustable focus ensures optimal illumination across a wide range of sample.
- Compatible with many Infinity AFM environmental accessories, including a fully closed cell to image in ultra-low water/oxygen environments.



Infinity PV configuration (top) and illuminator schematic (bottom) showing the optics with the three main optical elements superimposed for reference and orange light path ray tracings. A minimum number of optical elements (collimating lens, mirror, and focusing lens) are used in order to help preserve the intensity and spectral fidelity of the light source. Modularity makes it easy to add other elements (e.g. filters, polarizers, etc.) in the collimated light path. The entire assembly is readily accessible for any experimental adjustments or custom modifications.



Left: CdSe on Indium Tin Oxide (ITO). The image shows current on 3D topography acquired with conductive AFM at +1 V bias. The PV Option was used to irradiate the sample at an intensity of 0.9 W/cm² while scanning the middle of the scan area, inducing the measured photocurrent. Scan size 2 μ m.

Open design for maximum flexibility

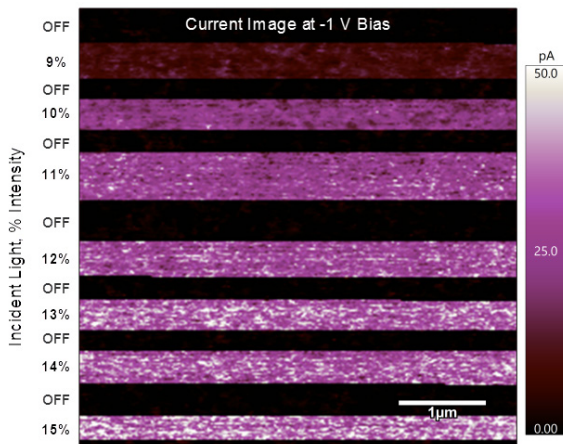
The PV components sit underneath the sample and are easily accessible via the hinged base of the MFP-3D Infinity. This allows you to illuminate the sample with the included LED illuminator or your own light source. The open design provides access for the placement of your own filters and polarizers for increased experimental flexibility.

Consistent illumination on the sample is critical to meaningful photocurrent measurements. The PV option utilizes an adjustable-focus lens to position the light from the illuminator directly onto the sample. It is easy to adjust the focus to accommodate a wide range of sample thicknesses.

All the benefits of the MFP-3D Infinity AFM

The MFP-3D Infinity AFM is an extremely low noise platform and provides a robust foundation with easy operation in any lab setting.

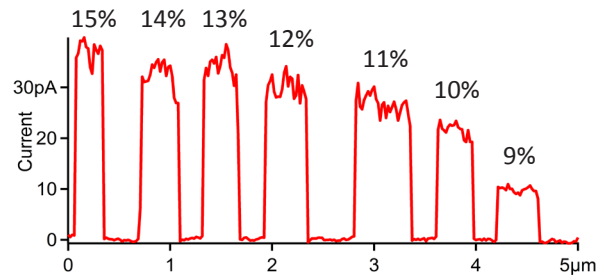
Asylum's full suite of electrical and mechanical characterization techniques are useable in conjunction with the PV option, allowing endless possibilities in experimental design. The PV option is also compatible with a wide range of MFP-3D Infinity environmental options, such as the Closed Fluid Cell, BioHeater™, and Humidity Sensing Cell, that enable complete isolation from the atmosphere.



Specifications

- **Light source:** LED, software controllable with color specified at time of order (white being standard; inquire about custom wavelengths), 1 Sun intensity possible.
- **Lens (optical system):** 25 mm OD x 30 mm EFL aspherized achromat.
- **Focus range:** 2 mm fine focus, 10 mm coarse focus; sample thickness to 10 mm.
- **Filters:** Multiple insertion points for commercially available filters.
- **Compatible techniques:** ORCA™ conductive single and dual gain, Scanning Kelvin Probe Microscopy (SKPM), AM-FM Viscoelastic Mapping; Contact; Dual AC; Dual AC Resonance Tracking (DART); Fast Force Mapping (FFM); Force Mapping (Force Volume); Force Modulation; Frequency Modulation; Lateral Force (LFM); Loss Tangent Imaging; Magnetic Force Microscopy (MFM); Nanolithography and Nanomanipulation; Phase Imaging; Tapping (AC Mode); Tapping with digital Q control.
- **Warranty:** Full two-year comprehensive warranty.
- **Support:** No charge technical support and expert applications support for the lifetime of the AFM accessory.

See MFP-3D Infinity brochure for all other specifications.



Left: P3HT:BCBM, ORCA conductive AFM image at sample bias of -1 V. Illumination was turned off (black stripes) and on (purple stripes) as scan progressed. Intensity difference between adjacent purple stripes was 1%. **Above:** Cross section plot showing change in current due to difference in incident light intensity.

Visit www.Oxford-Instruments.com/AFM to learn more

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