

# Atomic Force Microscope

## Scanner and positioner

**Range (XYZ):** 30  $\mu\text{m}$  (Open Loop)  
3  $\mu\text{m}$  (Small range setting)

**Resolution (XYZ):** 0.5 nm (Open Loop)  
0.05nm (Small range setting)

Z Noise : 100 pm RMS

**Out of plane motion:** < 1 nm over full range

**Resonance frequency (XYZ):** 350  $\times$  220  $\times$  250 Hz  
(unloaded).

**Motorized sample positioning (XYZ):** 12 mm,  
step size < 0.5  $\mu\text{m}$ .

**Motorized cantilever positioning (Z):** 12 mm,  
step size < 0.5  $\mu\text{m}$ .

## Sample size

Open design allows ample space for broad class of samples.

5 cm x 5 cm x 1 cm.

## Electronics and controller

Dedicated FPGA controller with > 1 kHz loop rate

19 bits eq AI/AO

Max. image size: 2048 px x 2048 px

## Cantilever sensing

Beam deflection with high sensitivity photo detector.

Photo-detector noise: 0.21 pW/  $\sqrt{\text{Hz}}$

## Optical microscope

10x / 0.3 NA long working distance objective

400  $\mu\text{m}$   $\times$  300  $\mu\text{m}$  field of view.

# Laser Scanning Microscope

## Motorized LSM scanning

**Max. range:** 12 mm  $\times$  12 mm

**Lateral resolution:** 0.5  $\mu\text{m}$

**Speed:** 1mm/s "nominal"

**Piezo sample scanning:**

30  $\mu\text{m}$   $\times$  30  $\mu\text{m}$  with image array option

## Optics

**Wavelength & power:** 405 nm,  $\sim$  0.5 mW on sample

**Spot size:** 2.2  $\mu\text{m}$  diffraction limited

**Photo-detector noise:** 0.21 pW/  $\sqrt{\text{Hz}}$

**Objective:** 10x, 0.3 NA

**Fluorescence filter:** CWL 460 nm (optional)



**Dimensions:** 500 mm X 300 mm X 550 mm

**Weight:** 15 kg

## Features

**GUI:** Multiple tabs for easy navigation  
AFM Scan settings, Oscillation control, Motors & Camera, LSM scan, Graphing, Advanced.

**AFM Modes:** Contact mode, Amplitude Modulation, Frequency Modulation, STM.

**AFM advanced modes:** User selectable channel for Z-control and an additional channel for data collection. Enables Conductive AFM, Magnetic Force, Electrical Force.

User configurable spectroscopy modes.

**User inspired features:** Array scans, tip protection, scan direction control, slope correction, notch filter, multi graphs.

## Optional

- Liquid chamber
- Electrochemical chamber
- Acoustic enclosure
- Closed loop scanner (100  $\mu\text{m}$  x 100  $\mu\text{m}$  x 100  $\mu\text{m}$  )
- Fluorescence filter
- Glove box integration



mm to nm in seconds