The MCL-NSOM is a fully operational near field scanning optical microscope. It has been built on Mad City Labs versatile RM21™ microscope which allows users to convert between NSOM, SPM, and fluorescence optical microscopy techniques.

The MCL-NSOM builds on our successful resonant probe SPM and incorporates common elements such as the MadPLL® phase lock loop controller. The NSOM also exploits our expertise in precision motion control by including six axes of motorized positioning, for the sample and NSOM probe, and three axes of closed loop nanopositioning to provide exceptional position resolution and accuracy.

The MCL-NSOM also includes a 635nm laser excitation source, fiber launch, objective lens (20x, 0.4 N.A.), CMOS alignment camera and avalanche photodiode detector. The microscope configurable design allows researchers to tailor the instrument for many different optical microscopy techniques including near field spectroscopy.

The MCL-NSOM is operated in aperture mode with shear force feedback. The standard 5 modes are supported: illumination, collection, illumination and collection, reflection and reflection collection. We supply a LabVIEW based software package which automates the motion control features.
## Technical Specifications

<table>
<thead>
<tr>
<th>Motion Control</th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Sample micropositioning (XY)</td>
<td>25 mm</td>
<td></td>
</tr>
<tr>
<td>Lens micropositioning (Z)</td>
<td>50 mm</td>
<td></td>
</tr>
<tr>
<td>Fiber micropositioning (XYZ)</td>
<td>25 mm</td>
<td></td>
</tr>
<tr>
<td>Micropositioning step size</td>
<td>95 nm</td>
<td></td>
</tr>
<tr>
<td>Micropositioning controller</td>
<td>Micro-Drive</td>
<td></td>
</tr>
<tr>
<td>Nanopositioning range of motion (XYZ)</td>
<td>200 µm × 200 µm × 30 µm</td>
<td></td>
</tr>
<tr>
<td>Resolution</td>
<td>0.4 nm (XY), 0.06 nm (Z)</td>
<td></td>
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<tr>
<td>Step size</td>
<td>0.2 nm (XY), 0.03 nm (Z)</td>
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<tr>
<td>Nanopositioning controller</td>
<td>Nano-Drive®</td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>USB 2.0</td>
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</tr>
<tr>
<td>DAC/ADC</td>
<td>20 bit</td>
<td></td>
</tr>
<tr>
<td>TTL outputs</td>
<td>4 channels</td>
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</table>

<table>
<thead>
<tr>
<th>NSOM</th>
<th></th>
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<tbody>
<tr>
<td>NSOM operation</td>
<td>Aperture</td>
<td></td>
</tr>
<tr>
<td>Feedback</td>
<td>Shear Force</td>
<td></td>
</tr>
<tr>
<td>Phase lock loop controller</td>
<td>MadPLL®</td>
<td></td>
</tr>
<tr>
<td>Software</td>
<td>AFMView™</td>
<td></td>
</tr>
<tr>
<td>Software compatibility</td>
<td>LabVIEW™</td>
<td></td>
</tr>
<tr>
<td>Objective lens</td>
<td>20x, 0.4 N.A. (Infinity corrected)</td>
<td></td>
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<tr>
<td>Excitation and detection</td>
<td>635 nm, 5 mW laser diode with fiber launch</td>
<td>0.3 MP fiber alignment CMOS camera</td>
</tr>
<tr>
<td>Supplied accessories</td>
<td>Coaxial illuminator (LED)</td>
<td>Tuning fork with attached single mode fiber for NSOM</td>
</tr>
<tr>
<td>Power supply</td>
<td>90 - 260 VAC (50/60 Hz)</td>
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</tr>
<tr>
<td>Operating system</td>
<td>Windows Vista/7/8/10</td>
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