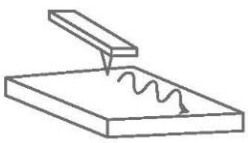
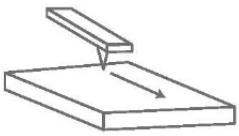
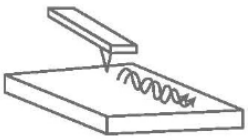
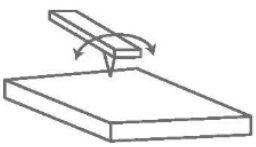
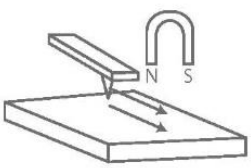
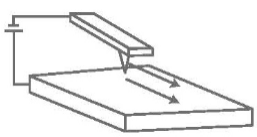
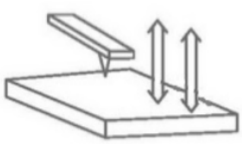
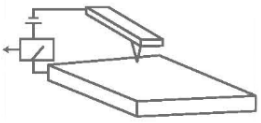
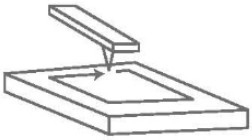
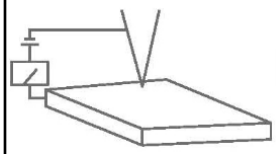
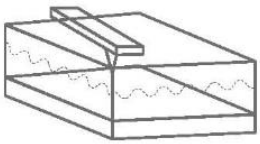
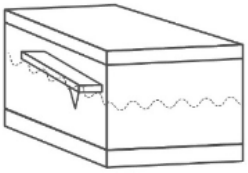
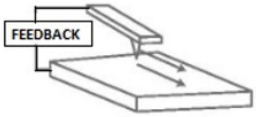
Scanning Modes

The LS AFM includes the most commonly used AFM Modes. They are:

Vibrating (tapping) 	Vibrating mode imaging is the most common mode for measuring topography images with an AFM. In vibrating mode the vibration amplitude of the probe is held constant during a scan. Adjustable parameters include the vibrating frequency, amplitude of vibration, and the amount of dampening of the vibrating probe.
Non – vibrating (contact) 	In non-vibrating mode, commonly called contact mode, the deflection of a cantilever is held constant during scanning. This mode is often used for scanning in liquids and is also used for measuring force-distance curves.
Phase 	Phase mode images are measured in vibrating mode and are useful for identifying different areas of hardness on a surface. The technique operates by measuring the phase change caused by various materials on a surface while scanning.
Lateral Force 	Lateral force mode measures the local friction a probe senses as it is scanned across a surface. The friction can be caused by surface texture or by different chemical composition.

Optional modes that can be purchased with the LS AFM include:

Magnetic Force 	Measures surface magnetic field by incorporating a magnetic probe into the AFM. MFM is used to generate images of magnetic fields on a surface, and is particularly useful in the development of magnetic recording technology. Magnetic fields associated with individual magnetic nanoparticles are also revealed through MFM.
Electric force 	Electrostatic Force Microscopy (EFM) is a type of dynamic non-contact atomic force Microscope where the electrostatic force is probed. “Dynamic” here means that the cantilever is oscillating and does not make contact with the sample. This force arises due to the attraction or repulsion of separated charges.

Advanced F/D 	Force Distance Curves measure the deflection of a cantilever as it interacts with a surface. Force-Distance measurements monitor such surface parameters as: Adhesion, Stiffness, Compliance, Hardness, and Contaminate Thickness. This advanced AFM module is flexible and enables many types of experiments.
Conductive AFM 	The C-AFM measures topography and conductivity images simultaneously. This option allows measuring current-voltage (I/V) curves at specific locations on a surface.
Lithography 	This NanoLithography software option enables the AFM probe to alter the physical or chemical properties of the surface. Created in LabVIEW and integrated with the AFMControl software. VI's are available to customers who want to modify the software and create new capabilities.
Scanning Tunneling 	In the STM, the current flow between a metal probe and a sample are used to control the distance between the conductive probe and conductive surface. When the probe is scanned across the surface, if the current between the probe and surface are held constant with a feedback control loop driving a piezo ceramic, the topography of the sample's surface in measured.
Open Liquid Cell 	This option includes a special probe holder and open liquid cell for scanning samples submerged in liquids. The Dunk and Scan can directly replace the HR AFM probe holder.
Environmental Cell 	The environmental cell, or closed cell, is used for scanning samples in liquid or gas environments. Both the sample and probe are enclosed in a chamber that has an entry and exit port for the liquid or gas.
Scanning Kelvin Probe 	SKPM measures the potential difference between a conductive probe and a conductive sample. The SKPM measurement is made by monitoring the output of a feedback loop that adjusts the potential on a probe so that the potential difference between the probe and surface is zero.

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