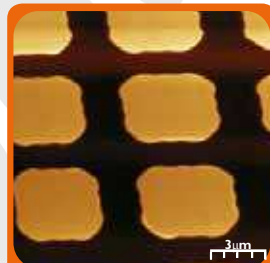


# USB Digital PLL

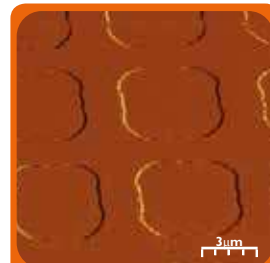
Digital Phase Locked Loop System for  
Atomic Force Microscopy &  
Magnetic Force Microscopy



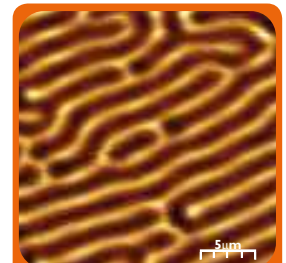
Non-contact AFM image of  
Calibration Grating RMS Amplitude



Non-contact AFM image of  
Calibration Grating Topography

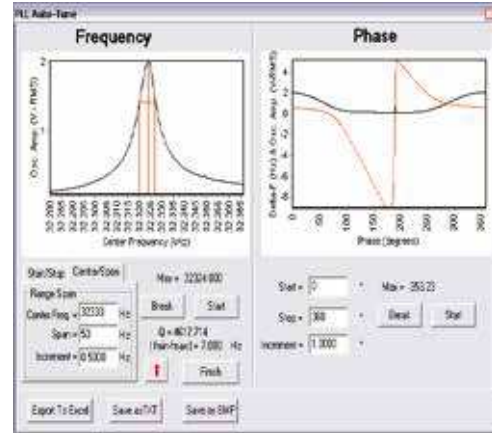


Non-contact AFM image of  
Calibration Grating  $\Delta F$



MFM image of  
Garnet Thin Film (24x24 μm<sup>2</sup>)  $\Delta F$





## System Specifications

Frequency Range	: 1 kHz - 300 kHz / 10 kHz - 2 MHz (can be customized)
Operating Modes	: Self Exciting Oscillation, Constant Amplitude, Constant Excitation, Lock-in
Measurement Range	: $\pm 150$ Hz, $\pm 300$ Hz, $\pm 450$ Hz, $\pm 600$ Hz
Measurement Resolution	: 4.6 mHz, 9.2 mHz, 13.8 mHz, 18.3 mHz
Demodulation Bandwidth	: 30 Hz - 1 kHz (software adjustable)
Operating Point	: Manual Select, Automatic Search
Spectrum Analysis	: Amplitude & Phase
Monitor Display	: Output Signal, Frequency Shift, Excitation, Amplitude, Dissipation
Input Signal	: 20 mVpp - 20 Vpp, automatically adjusted
Output Polarity Selection	: Available
Output Offset	: $\pm 10$ V adjustable
Excitation Amplitude Range	: 0.2 Vpp - 20 Vpp, adjustable
Amplitude Feedback BW	: 1 kHz
Amplitude Control Gain	: $\times 1$ - $\times 100$
Amplitude Set Point	: 0.05 Vrms - 7.00 Vrms (16 Bit resolution)
Digital Phase Shift for Excitation Channel	: 0 - 360° with 0.09° resolution (12 Bit)
Temperature Coefficient	: $< 40$ ppb of $f / ^\circ\text{C}$ 0 - 50°C (Using temperature compensated 20 MHz Quartz Crystal Master Oscillator)
Computer Interface	: USB 2.0 High Speed, 480 Mbps
Main Voltage Options	: 100/110 V 60 Hz AC, 220/230 V 50 Hz AC

Software upgrades are free for lifetime

Note: Specifications are subject to change without notice.