Application Notes AP 1107

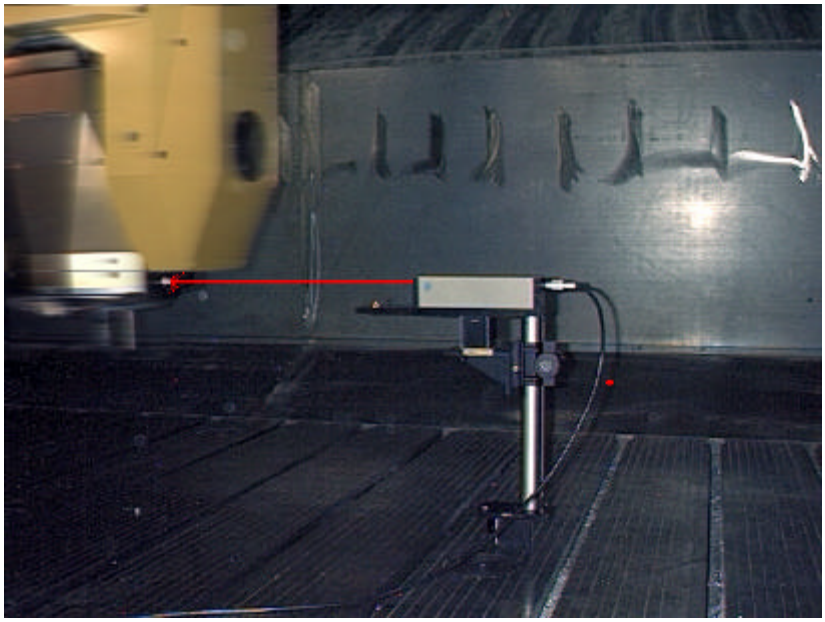
Measurement of Settling Time, and Resonance Frequency of a Stage or Machine

I, What is the problem?

Motion dynamics, such as settling time, and resonance frequency are very important. Usually, accelerometer and spectrum analyzers are used to measure the acceleration and power spectrum. It is rather difficult to measure the displacement, velocity and settling time directly.

II, How LDDM solves the problem.

The LDDM calibration system can measure the displacement at a very high velocity, high accuracy, and high sensitivity. Connecting the LDDM output to a PC computer with a special plug-in card (IPC-400), the displacement data can be collected up to 800,000 data per sec. With a displacement sensitivity of 2.5 nanometers. Differentiate the displacement nomograph is shown in Fig.1.



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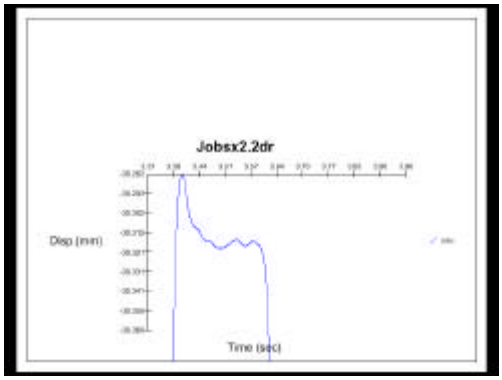
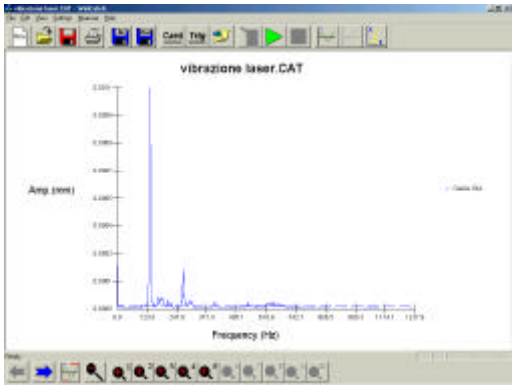
III, How it works.

The LDDM calibration system can measure the displacement at a high speed and high resolution. It is the RS232 interface which limits the data rate. Using a direct interface, IBM PC plug-in card, the data rate can be increased up to 800,000 data/sec. The size of the data file is 64,000 data points. For example, to measure the settling time of a precision stage, mount the laser head on the stationary base and the retroreflector on the moving stage. Drive the stage at the maximum velocity and acceleration from A to B and stop. The data, displacement Vs time will show the maximum velocity and acceleration, over shoot with oscillation and damping or under shoot with long risetime. The settling time can easily be determined. The resonance frequency can also be obtained by FFT and power spectrum. Other applications are vibration of a Pyrotechnic shock and an ultrasonic wirebonder, velocity and acceleration of a collision, and calibration of an accelerometer.





IV, Need more information.

Please call Optodyne or Your Local Representative.

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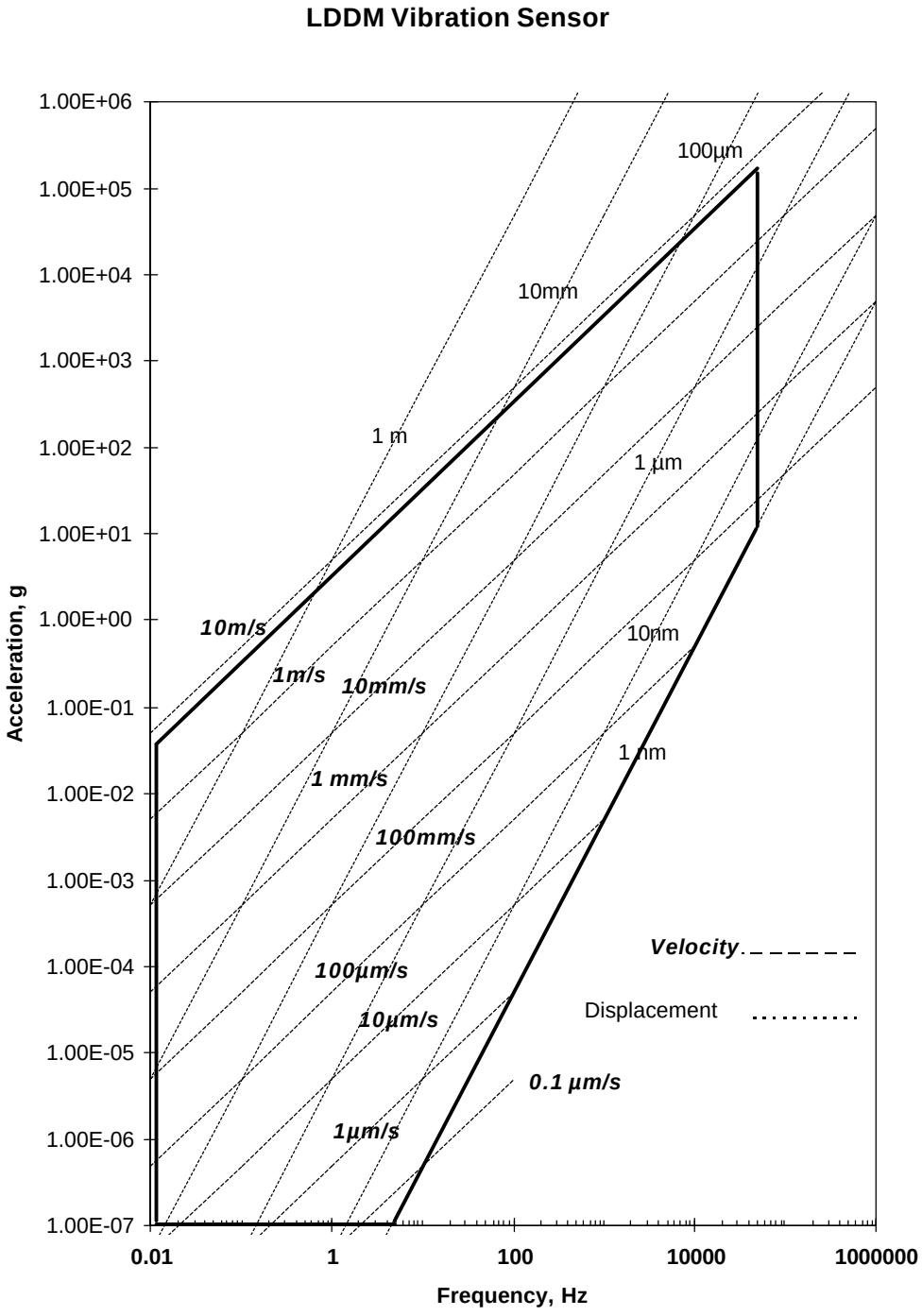

Fig. 1 Range Nomograph

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