

Laser Doppler Displacement Meter

LB-500



OPTODYNE's LB-500 **Laser/Ballbar** (Patent Pending) is an add-on package to OPTODYNE's MCV-500, **Linear-Machine Calibration System**. The combined system can be used to calibrate CNC machine tools, CMM's (Coordinate Measuring Machines), and other precision measuring machines and stages and perform circular test for servo-tuning and dynamic testing.

OPTODYNE's **Laser/Ballbar** provides a rapid and efficient way of measuring a machine's contouring accuracy along a circular path. The circular test shows how the axes work together to move the machine in a circular path. The deviations from a perfect circle are caused by errors such as backlash, servomismatch, scale mismatch, machine geometry, periodic errors, stick-slip, etc. A polar plot is then generated to show the machines true contouring capabilities.

Because of the unique capabilities, High Data Rates, (up to 1000 data/sec), High Resolution ($0.01\mu\text{m} - 0.000001''$) and Small Radius, (as small as 0.1"), dynamic errors at high machine feed rates can also be determined. The Windows™ software, running on any IBM compatible computer, is user friendly and designed to collect and analyze data in accordance with a variety of industry standards.

LASER/BALLBAR



OPTODYNE

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MAJOR FEATURES AND BENEFITS

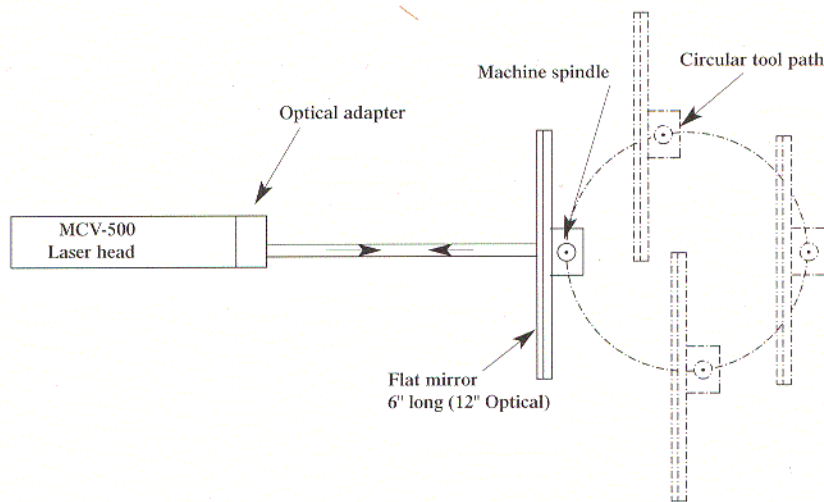
- Easy to setup and operate.
- Non-contact, no cables to worry about, no friction or bearings.
- Radius can be varied continuously from 0.1" to 3".
- High data rates, up to 1000 data/second.
- N.I.S.T. traceable laser accuracy.
- Windows™ software and Notebook PC.
- Static calibration and dynamic tuning "two instruments in one".
- Automatic environmental compensation
- Compact and portable.
- Measures velocity and acceleration.

MAJOR APPLICATIONS

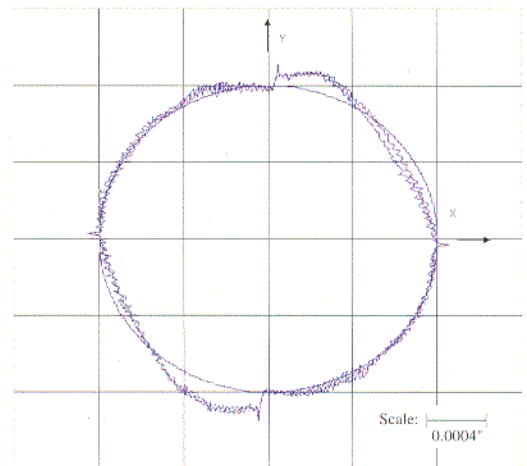
- Calibration of CNC machine tools and CMM's.
- Squareness of machine axes.
- Quality control Maintenance.
- Dynamic testing of machines.

Specifications

The unique property of the **MCV-500 Laser Calibration System** is the single aperture optical arrangement. Using a flat-mirror as the target and aligning the mirror to be perpendicular to the laser beam, the mirror motion along the laser beam direction can be measured. Since the mirror motion does not displace the laser beam, the alignment of the measurement is not affected. Therefore, the displacement of a circular path, along the beam direction can be measured. By combining the data from two axes, a polar plot of the motion can be generated.



Schematic of a laser circular test



A typical polar plot using the Laser/Ballbar

LB-500

Configuration:

Laser Calibration System (not included)
 Flat Mirror Target 6"
 Optical Adapter
 Magnetic Base & Post
 PC Interface Card and Cable (PCMCIA)
 Windows™ Software

MCV-500
 LD-71
 LD-69
 LD-03P
 IPC5-1000
 W-500LB

Capability (Circular Tests):

Laser Stability	0.1 PPM
Linear Accuracy	1 PPM
Resolution	1 microinch (0.01μm)
Measuring Range	up to 40 inch (1m)
Radius*	0.1 to 3 inch (2.5 to 75mm)
Data Rates	1-1000 data/second
Maximum Data Points	10,000 per run

Options:

Steering Mirror for alignment in tight quarters LD-37S
 Larger Flat-Mirrors available on request.

*NOTE: Larger Radius available on request