EXCEL PRECISION

1100B LASER CALIBRATION SYSTEM

Excel Precision's 1100B Laser Calibration System offers a precise, cost-effective solution to your calibration needs. The 1100B Calibration System is designed to conveniently measure the six degrees of freedom. This device uses interferometers and sensors to simultaneously measure linear displacement, horizontal straightness, vertical straightness, yaw, and roll. Pitch data are accumulated from the second pass. Flatness and velocity measurement are also available.

The 1100B Calibration System provides fast, accurate data to minimize calibration costs for machine tools, CMM or other precision measurement applications. The system's two-piece construction promotes ease of use and dramatically decreases set-up time, resulting in higher calibration throughput and minimized cost.

Today's machining customers require high accuracy and compliance with quality initiatives, such as ISO 9000, TQM and predictive maintenance. Machine tool accuracy checks have become more important for job shops. However, checking accuracy has not been an easy task because there have been no instruments available to perform the calibrations quickly and accurately, easy to set up, and can simultaneously measure more than one degree of freedom. Traditional laser interferometer systems measure the six degrees of freedom one at a time. This is not only expensive and time consuming, but also hard to set up, and maintaining accuracy is difficult when measuring optics are mounted and dismounted while changing from one parameter to another.

- **5 DOF simultaneous measurement**
- **Pitch measurement 2nd pass**
- **2-piece construction**
- **Computer output**
- **Wavelength Compensation available**

- **Easy to use**
- **Less set-up time required**
- **Convenient to use in your PC**
- **Precision in any environment**
- **Increased efficiency ® lower cost**

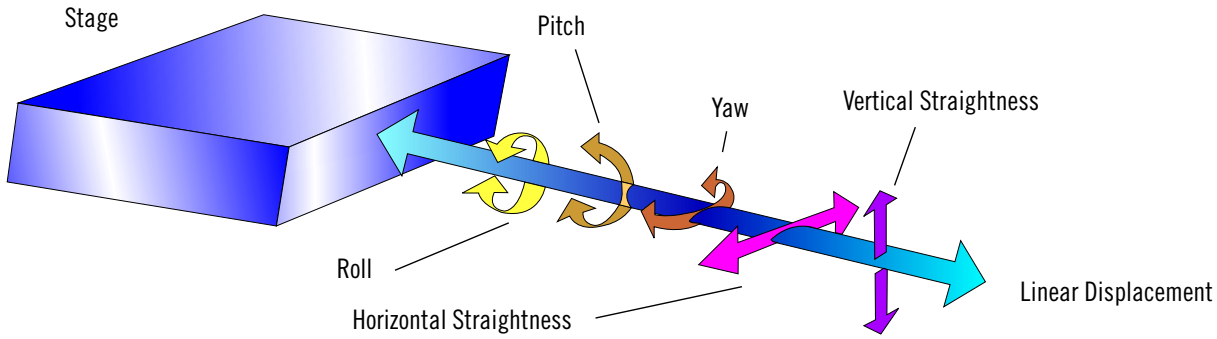
APPLICATIONS

Machine Tool Calibration
CNC & CMM Calibration
Linear Displacement
Straightness Measurement
Velocity Measurement
Pitch Measurement
Yaw Measurement
Roll Measurement

OPTIONAL APPLICATIONS

Flatness Measurement
Parallelism Measurement
Squareness Measurement
Vibration Measurement

There are six parameters that affect the accuracy of a CNC machine: linear movement of the machine bed, wobbling (pitch, yaw, and roll) and rattling (horizontal and vertical) during movement.



The Excel Precision 1100B Metrology System is designed to provide machine tool users, CMM users, and CNC machine center manufacturers an easy-to-use, accurate calibration system with the following features and benefits:

Easy to use. The 1100B system does not require a trained engineer to set up and perform the calibration. A technician can easily learn perform the job within a short amount of time.

5 DOF simultaneous measurements. Linear movement, pitch, yaw, roll, horizontal straightness, and vertical straightness are measured simultaneously with a single set up, saving 80% of set-up time compared with a traditional laser interferometer.

Improved accuracy. Simultaneous measurement of these parameters improves the calibration accuracy.

Two-Piece construction. Single integrated optical configuration eliminates the need of purchasing variety of optics. This increased efficiency leads to a lower cost for the user.

Convenience. Owning an 1100B system allows freedom to calibrate using your own personnel and on your own schedule.

Data logging in real-time. Real-time data logging with archive capability for quality audit and customer services.

Computer output. Compatible with MS Windows 95, 98, 2000, XP. Software analysis supports NMTBA, VDI, ISO and ASME B5.54 standards. A report can be immediately generated after the calibration procedure for customer acceptance.

Zeeman laser technology. The Zeeman laser in conjunction with the proprietary heterodyne signal processing technique makes Excel Precision's metrology system the most accurate machine tool calibration system.

Wavelength compensation available. Excel's wavelength compensation devices such as Weather Station, Material Sensor, and Refractometer allows precise calibration in any environment.

NIST standard. The 1100B is traceable to NIST and international standards.

The 1100B is an integrated optical module that can be retrofitted with a traditional laser interferometer laser head. This provides maximum flexibility to shop owners for budgeting of purchase and the applications. The 1100B unit employs a patented technology to measure linear movement, pitch, yaw, roll, horizontal straightness and vertical straightness simultaneously. The unique, two component system greatly facilitates alignment and taking measurements. The 1100B Metrology System can additionally measure squareness, flatness, and parallelism just like a traditional laser interferometer.

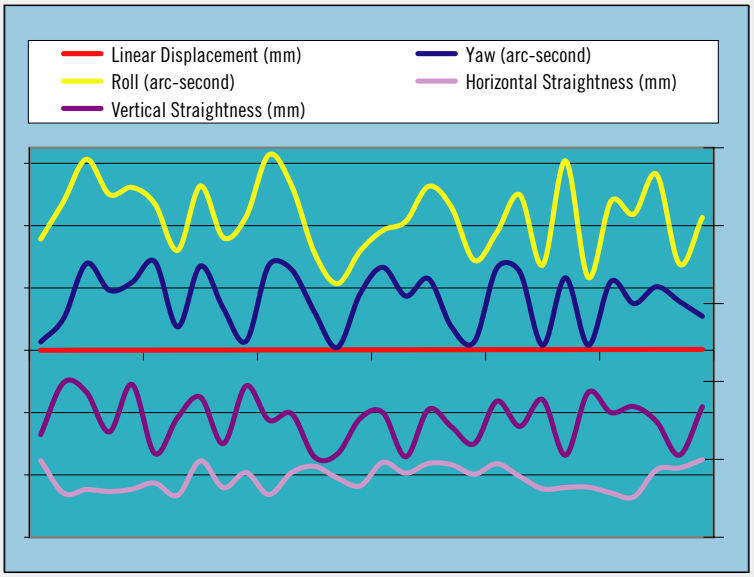
Complete 1100B System

- Laser & Opto-Electronics Module
- Target Reflector & Alignment Accessories
- Laser Head Combined Cable
- Tripod and Mounting Accessories
- Wavelength Compensation Board
- Software
- Signal Processing Card
- PC w/Flat panel Monitor

LASER HEAD SPECIFICATIONS

Laser Wavelength	632.997134 nm (vacuum)
Frequency Stability	0.002 ppm (one hour), 0.02 ppm (life-time)
Output Power	0.1 mW (nominal) each laser beam
Laser Beam Diameter	4.8 mm (nominal) each laser beam
Laser Beam Separation	32.512 mm (1.28 inches)
Power Requirement	100-240V AC, 50-60 Hz
Power Consumption	23 Watts during operation (35 watts during warm-up)
Environmental Conditions (operating)	0 - 40 degrees C
	0 - 95% relative humidity, non-condensing

DATA DISPLAY



SOFTWARE

Besides being easy to set-up and taking simultaneous measurements, the 1100B software is very user-friendly and has many convenient features. Excel's ASCII data format allows data compilation so it can be easily downloaded into CNC control through a Windows compatible notebook computer and an RS-232 port. This capability enables the CNC machine manufacturer and CMM manufacturer to take the information directly from the 1100B to compensate for errors, without manually writing a calibration look-up table for each produced unit.

The software also features graphical display for the calibration to let the user identify the location of the defect in real-time during the calibration process.

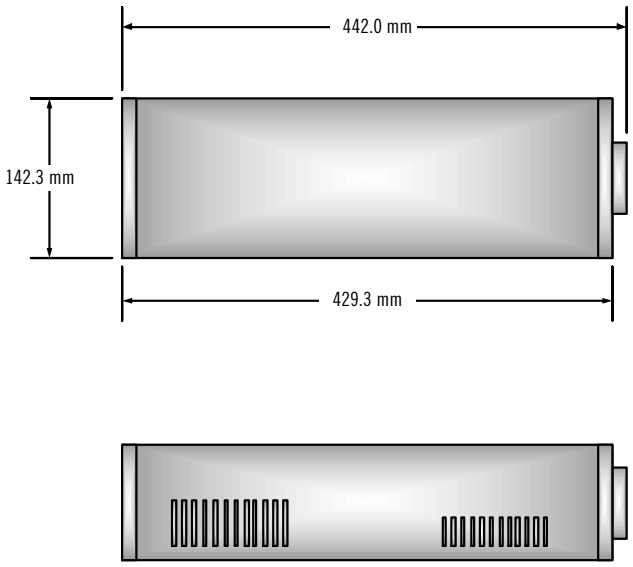
Because the 1100B software automatically collects data, the potential for human error is reduced, and the results have a high degree of reliability. The software features online help and easy commands, which allow different screens to be viewed, such as a Data Collection Screen that displays two numbers-the instantaneous position and the target position. A Setup Screen displays measurement options that include axes choice and automatic or manual data collection.

Excel Precision has provided more than 2,000+ laser interferometer systems to the machine tool, semiconductor manufacturing and hard disk drive industries, and national standards laboratories. Customers purchase Excel Precision's laser interferometers for their accuracy and reliability. Excel provides expertise in laser interferometry, machine tool metrology, and excellent customer support.

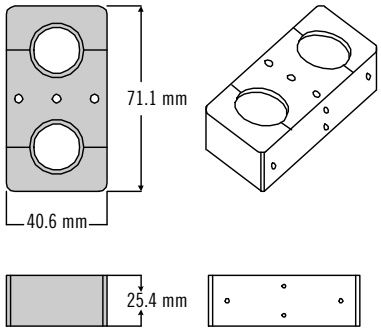
SPECIFICATIONS:

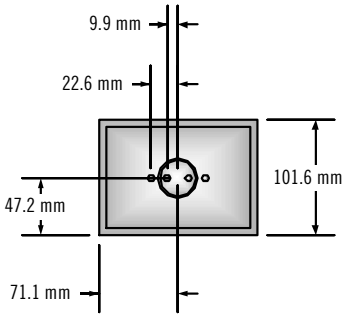
FUNCTION	MEASUREMENT RANGE	ACCURACY	RESOLUTION
Linear Displacement	+/- 5 meters	0.0005% without wavelength compensation	10 nm
Yaw	+/- 3600 arc-sec; +/- 5 degrees with angle correction	+/- 0.2% of displayed value	0.1 arc-sec
Pitch	+/- 3600 arc-sec; +/- 5 degrees with angle correction	+/- 0.2% of displayed value	0.1 arc-sec
Roll	+/- 3000 arc-sec	+/- 3% of displayed value (+/- 0.3% optional)	0.5 arc-sec
Horizontal Straightness	+/- 500 µm	+/- (2 µm + 0.5 µm/m)	0.5 µm
Vertical Straightness	+/- 500 µm	+/- (2 µm + 0.5 µm/m)	0.5 µm
Vibration	+/- 500 µm in all X, Y, and Z directions simultaneously	+/- (2 µm + 0.5 µm/m)	0.5 µm
Data Smoothing	Depending on user's application. Smoothing period can be set from 10 seconds to 75 seconds.		

LASER & OPTO-ELECTRONICS MODULE



REFLECTOR MODULE (TARGET)





NOTE: DRAWINGS NOT TO SCALE

TOLERANCE = +/- 0.3 mm

For more information, please contact

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