

MAJOR ADVANTAGES OF THE OPTODYNE SYSTEM

There are numerous advantages that the Optodyne laser system has over our major competition. These advantages are not in any order and each potential customer will perceive them differently.

SIZE & OPTICS:

Conventional interferometer systems are large and bulky. They require numerous different optics and other hardware for the various measurements. The minimum number of cases required to transport the system is two, one case for the laser system and a second for the tripod. As additional measurement capabilities are added additional cases must also be added.

The compact size of the Optodyne system will be evident to most people. Also because of the technology the number of optics for each measurement has been reduced. Also without a tripod the system can be mounted directly on the machine eliminating the need to remove or disassemble machining enclosures.

This is a major advantage to people that are going to use the system for field service. The compact size reduces or eliminates shipping costs and allows the user to check the system as luggage without an additional charge for weight or number of pieces. (Airlines now allow only two pieces of checked luggage with a weight limit of 70 lbs. per bag)

EASE OF USE:

In the past, companies that had laser systems usually had a laser expert. This person was normally the only one in the shop that knew how to setup and run the laser.

With the Optodyne system the setup and software is easy enough to learn that with a minimal amount of training anyone can use the system. The MCV-500 for instance can be setup with little or no training as long as the user has a working knowledge of the computer

With the Optodyne system, the laser head bolts directly to a specially designed straightedge, this eliminates the need for realignment of the system, when another path is desired it is just a matter of moving the whole straightedge to the next path. Because of the ability to monitor both linear and angular displacement the data can be collected on the fly. If the operator desires to collect data manually, the linear displacement is conveniently displayed on the computer screen; this eliminates the need for a marked straightedge.

SYSTEM RANGE:

Range is not normally an issue but again there are limitations with conventional interferometer systems. Competitor's systems have ranges up to 80 meters. The Optodyne system has ranges up to 100 meters.

SYSTEM SPEED:

Much of the newer technology is focusing on high speed machining, machines are available with speeds in excess of 60 inches per second. Interferometers are limited to a maximum speed of 42 inches per second.

The MCV-500 system has a maximum speed of 144 inches per second while the other calibration systems can measure at speeds up to 72 inches per second.

ROTARY TABLE CALIBRATION:

Conventional techniques to calibrate a rotary table are based on the comparative method. Usually, a reference rotary table with a Hirth coupling (a rotary calibrator) is used in conjunction with a laser interferometer angular measurement system. The accuracy of the calibration is limited by the accuracy of the reference rotary table. An accurate reference table with a Hirth coupling is very expensive, (\$10,000 to \$25,000) heavy and must be calibrated independent of the laser system.

without any formal training. For the larger systems it is recommended that the customer purchase the optional training to familiarize themselves with the various setups and software options.

SOFTWARE:

Optodyne has offered and supported Windows™ software for almost eight years. The Windows™ software is easy to use; with only two windows per measurement; sub-screens are not a problem. Easy to decipher commands allow the operator to move around the screens without problems. A complete help file is also available anytime during the measurement.

COMPUTER INTERFACE:

The calibration systems have two different interfaces, the RS-232 port for the static calibrations and a PCMCIA card interface for the new Laser/Ballbar system. The Laser/Ballbar can collect data up to 1,000 data points per second, this is four times faster than our major competition.

QUICK SETUP TIMES:

Conventional interferometer systems are normally very time consuming to setup while the Optodyne system can be setup in a matter of minutes. Also with the dual beam feature the operator can collect linear, angular, and straightness data simultaneously. This not only reduces the number of runs required to collect the data it also eliminates different setups for the different measurements.

SURFACE PLATE CALIBRATION:

Interferometers are very rarely used for surface plate calibration. The reason for this is the amount of time required to setup and collect the data. To calibrate a surface plate using an interferometer requires the operator to repeatedly move the tripod and realign the system. It also required the use of a precision straightedge, preferably marked with the various foot-spacer increments.

The LDDM dual-beam laser system can measure both linear displacement and angular displacement simultaneously. This additional information enables the dual-beam laser system to calculate the center of rotation and the beam separation. The errors caused by run-out, wobble, parallelism and non-coaxial, can also be minimized. Hence the rotary table can be calibrated directly without the need of a reference rotary table with a Hirth coupling.

The LDDM Dual-beam system can measure the rotational angle of a dual-retroreflector up to ± 10 degrees. With a small turntable, the angular measurement range can be extended to 360 degrees.

N.I.S.T. TRACEABILITY:

Other interferometer systems offer N.I.S.T. tractability through various standards that are maintained in-house or through other international laboratories located offshore.

At Optodyne our tractability is maintained directly through N.I.S.T., systems are calibrated on a regular basis and then those systems are used as our in-house standard for calibrating other systems. Optodyne specifies an accuracy of 1 PPM and a stability of 0.1 PPM, calibration reports have found the system accuracy to be as good as 0.2 PPM and the stability as good as 0.002 PPM. The system is maintained at Optodyne's Compton, CA facility, reducing lead-time for re-calibration of systems.

PRICING:

List pricing on laser systems doesn't seem to mean much these days, if the competition finds out that Optodyne is being considered as a supplier they will usually reduce their pricing or offer what seems to be a unlimited supply of demo units.

Optodyne can have up to a 70% price advantage depending on the system we are quoting. The optics used in the system are also less expensive thus reducing the cost throughout the life of the system.