RENISHAW
apply innovation™

Digital imaging enhanced with Renishaw laser calibration system

Founded in 1963, Polielettronica specialise in the development and manufacture of professional photographic scanning and printing equipment. The quality of images produced by such machines is highly dependent on the positioning and movement characteristics of equipment heads.

Polielettronica operates a corporate policy of continuous research and development in new technologies, a policy that resulted in a requirement to produce a highly accurate X-Y movement stage, the use of which enhances scanning head resolution and hence improves the quality of scanned images.

The X-Y stage needed to be reliable, accurate, easy to manufacture in large quantities, and required positional movements of 5 microns, with a positional accuracy of 0.05 microns. To verify the performance specifications of the manufactured stages Polielettronica purchased a Renishaw ML10 laser interferometer measurement system with linear and angular optics.

Each stage undergoes linear measurement tests with the Renishaw laser interferometer measurement system during production to determine positioning capability. Adjustments for any detected errors are made via the electronic equipment driving the piezo actuators. A custom designed solution incorporating kinematic optical mounts and dedicated fixturing ensured fast and simple changes to the laser's optical configuration during stage testing.

In addition to these standard linear tests with the laser interferometer system, dynamic test data can be used to compensate for errors introduced by the acceleration and deceleration forces acting on machine print or scanning heads during movement. Angular testing with the laser interferometer system is primarily reserved for use in corporate research and development activities rather than scheduled production.

Note:
Many system developers have turned to laser interferometer based measurement systems to give them the information they need to improve the design of production process machinery and shorten product development cycles. Renishaw's ML10 laser interferometer measurement system is used by OEMs in industries such as machine tools, co-ordinate measuring machines (CMM), semiconductor processing, flat panel production and biotechnology.

The unique properties of the ML10 laser interferometer measurement system mean that the system gives a position reading resolution of just 1.24 nm combined with a measuring range of many metres. This combination of resolution and measuring range makes the laser interferometer an ideal tool for characterising the performance of motion systems. All ML10 system measurements are interferometric and based on the wavelength of a known and regulated laser light source. Distance measurements based on the wavelength of light are recognised internationally as the primary measurement standard, and give the user assured traceability of measurement back to those at national standard's laboratories.