
OMC Technical Brief - Dual Camera Probing Technique

A dual camera probing system uses two cameras in a stereo arrangement to measurement the six degrees of freedom of a probe and hence the 3-D location of a stylus



What does it do?

The system operates as a portable CMM. The user manipulates a hand-held probe with a CMM stylus to probe points that should be measured. A button click enables a 3-D measurement to take place at about one per second.

Why use this technique?

The accuracy is reasonable over a reasonably large physical volume. The scheme is intuitive for the end user and hidden points can easily be measured by using various probe adaptors.

What are dual camera probe systems used for?

- Measurement of jigs
- Setting up tooling
- Measuring surfaces
- Quality control
- Hole positions checks
- Numerous automotive and aerospace applications

How does it work?

Two or more cameras are used to view the hand-held probe that has a number of targets mounted on it. The cameras measure the location of the targets from the known positions of the cameras by triangulation. The six degrees of freedom of the probe is then calculated using the 3-D locations of the targets and the known 3-D locations of the targets with respect to the probe and hence the probe tip. In one commercial system infra-red LED's are used as targets while in the other system retro-reflective targets are used. The calibration of the camera distortion parameters may either be carried out at time of manufacture or in the field. The estimation of the camera orientation will be performed prior to the user setting the cameras up.

What are the benefits?

- High accuracy measurement in-situ

What are the limitations?

- Two lines of sight are required