



image 3D WAND

CAMERA CALIBRATION TOOL

Image Systems' 3D Wand calibration tool removes the often complex and time consuming aspect found in traditional 3D Motion Analysis test preparations - such as lens calibration and camera orientation activities – with an automated and precise calibration method. The tool consists of a software module, compatible with the TrackEye and TEMA Motion Analysis platforms, as well as a hardware device, the wand.

NO SETUP TIME - NO PREPARATIONS

No need to place reference markers or perform surveys of the measurement volume in order to do the calibration. Just pick up the 3D Wand and start recording.

QUICK AND EASY TO USE

In a couple of minutes the user has the results from the calibration and can move towards performing the real test. The software completely automatically performs all procedures to obtain the calibration data, removing the risk of human error.

AUTOMATIC CALIBRATION CONTROLS

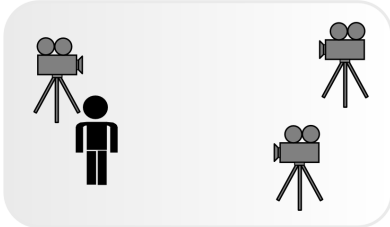
By using an active marker based on LED technology, combined with a very robust tracking algorithm, the automated software calibration process is fast, robust and provides a high level of accuracy.

MILANO SYSTEMS

ADVANCED TECHNOLOGICAL SYSTEMS

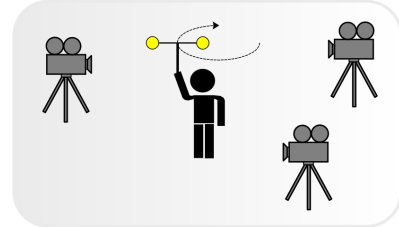
Milano Systems S.r.l.
Via Umbria 10 – 20090 Segrate (MI) Italia
www.milanosystems.it

PROCEDURE



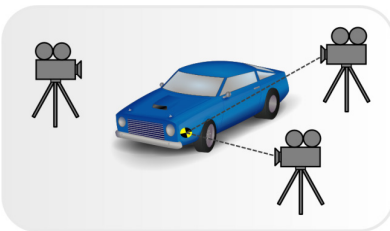
1. POSITION CAMERAS

Position two or more cameras for the test and set the final zoom, focus and aperture. Choose camera positions so that the points of interest on the test object will be visible from two or more cameras during the test. The accuracy of the analysis depends on the geometry between the points and the observing cameras: 90 degrees angles are optimal, 30 degrees – 150 degrees angles are acceptable.



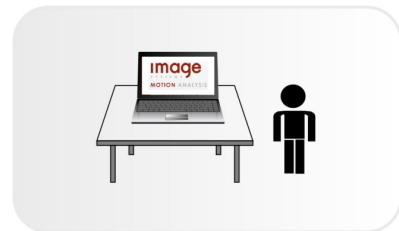
2. RECORD CALIBRATION IMAGES

Make a synchronized recording from all cameras. Move the wand in the entire measurement volume for approximately 20 seconds at frame rates of 25 – 50 Hz and Note: set exposure time to less than 2 ms to maximize contrast and avoid motion blur. Use regular room lighting.



3. RECORD TEST IMAGES

Set the final frame rate and exposure time for the test. Don't adjust the other camera settings or move the cameras. Perform the test and make a synchronized recording from all cameras.



4. ANALYZE TEST RESULTS

Load the calibration images into TrackEye or TEMA and automatically calibrate the system for camera position and orientation and lens distortion. Proceed to load the test images to analyze the points of interest in the test images. 3D results are computed for each point that is tracked in two or more cameras. Note: The calibration can be reused in future tests as long as the camera setup and positions are not altered.

TECHNICAL FEATURES

FLEXIBLE

Supports measurement volumes from 1x1x1 m – 10x10x3 m (w x d x h). Also supports any number of cameras (two is minimum).

CAMERA INDEPENDENT

Cameras of any model, frame rate and resolution can be used together. "All" image formats are supported.

POWERFUL

The Wand calibration computes all camera parameters simultaneously, as well as statistics and tolerances of the entire system.

ACCURATE

Tolerances from 1 – 5 mm can be achieved in test environments. The actual tolerance depends on the camera setup and is computed as part of the Wand calibration. Please contact Image Systems for more information.

QUALITY MATERIALS AND DESIGN

The carbon fiber construction and the active markers based on LED technology gives a robust, high quality wand that can be used for many years.