



Advanced full-field 3D Vibration Analysis

High Speed 3D Digital Image Correlation System Q-450

Applications

- Component and Material testing (Displacements, Strains, Youngs Modulus, Poisson Ratio, Elasto-Plastic Behaviour...)
- FEA validation
- Failure investigation
- Fracture mechanics
- High speed measurements & Vibration analysis (Dynamic applications, transient events)
- All shapes
- Advanced materials (CFRP, wood, fiber injected PE, metal foam, rubber...)

Features

- Extended export and import
- 3D display of measured values
- Fast and easy automated calibration procedure
- Online feedback of accuracy and quality
- Enhanced triggering functions
- Different coordinate systems

The Digital 3D Correlation System Q-450 is an optical measuring instrument for true full-field, non-contact and three-dimensional analysis of contour, displacements and strains on components and specimens.

Measuring Principle

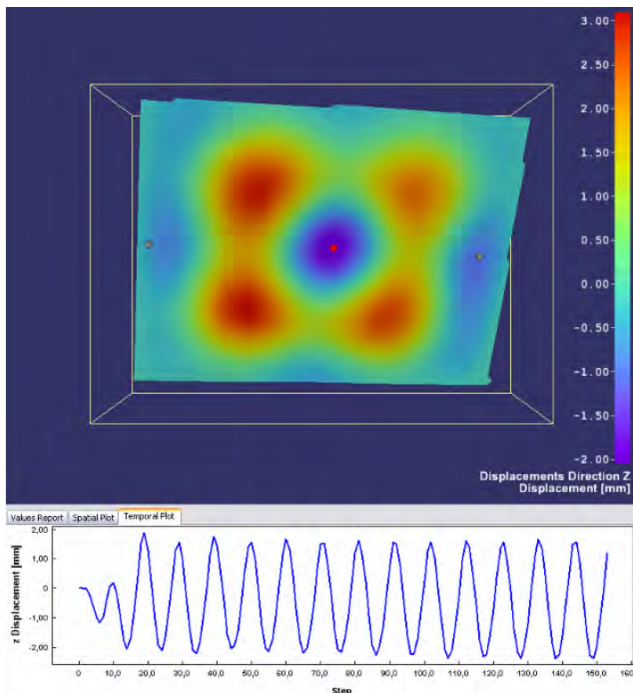
A stochastic pattern is applied onto the surface of the test object. This pattern can be sprayed with a white base colour and spattering a black colour on top.

The surface is observed with two high-speed sensors. The contour is measured first, then in each captured image homologous points of the stochastic structure are identified using a specific pattern matching algorithm.

The three-dimensional position of each object point is determined by triangulation performed by the software. If image sequences are recorded during the displacement of the object, the deformation of each object point is calculated automatically.

Dynamic Measurement Range

The system uniquely combines the high spatial resolution of full-field optical measurement with high temporal resolution. The dynamic range is from static to more than 20.000 Hz, with the capability to measure displacements from the μm -range up to several 10's of cm. The resolution corresponds to 10^{-5} of the field of view, e.g. a few μm for A4 paper size measurement area. Strains ranging from 100 $\mu\text{Strains}$ up to several 100 percent can easily be measured.



Full-field vibration of a membrane with temporal displacement of the central point.

User-friendly System

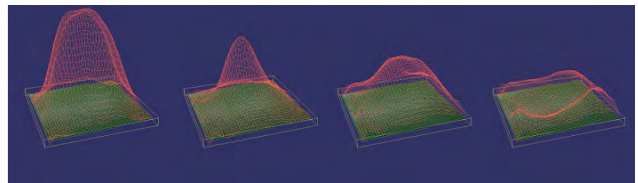
The robust software is designed for convenient data handling in a very intuitive way - extensive triggering functions are provided. The software Istra 4D fully controls the high-speed sensors.

For illumination, high intensity white light source for high image acquisition rates or stroboscopic cold light LED illumination system HILIS ensures very short exposure times.

An easy calibration procedure reduces measurement time.

Wide Range of Applications

The flexible design of the system opens a wide range of applications from microscopic investigations on microelectronic or biomedical materials up to large scale measurements of aerospace, automotive, marine and railway components.



Full-field displacement due to shock excitation. Out-of plane deformation is shown.

Additional information

For additional information please contact your Dantec Dynamics representative.

The specifications in this document are subject to change without notice