Laserinterferometric Vibrometer

LSV-NG Series

SIOS Meßtechnik GmbH

Design and Operation

Laser-interferometric vibrometers are used to measure precisely and contact-free the change of position over time of an object or a surface with any degree of roughness. It can measure mechanical vibrations in the range from 0 to 5 MHz with a resolution in the subnanometer range.

The measuring systems LSV 120 NG work with a fixed focal length, which can be adapted by exchangeable lenses. The vibrometers LSV 2500 NG are equipped with an integrated objective that can set the working distance continuously from a few millimeters up to several meters.

Lateral movements of the rough measuring surface to the measuring beam are only possible to a limited extent.

For data evaluation and output various modules are available. Thus, the measuring system can be adapted to special tasks and customer requirements.

Software for Windows - INFAS Vibro

- Spectral analysis
- Digital filtering
- Data record length from 256 to 32768 values
- Calculation of speed and acceleration of the vibration movement
- Averaging of spectra
- Setting options for external triggering

Applications

- Determination of the resonant frequencies of micro-objects and macroscopic components
- Determination of the vibration spectrum
- Determination of modes of vibration by spot sampling of the surface (hardware expansion required)
- Multicoordinate measurements with multiple systems
- Highly precise length measurements

Major Performance Features

- Highly precise, non-contact vibration and length measurements on surfaces of any roughness
- Robust design with splash-proof housing and sheathed fiber cable for industrial use
- Easy alignment and handling
- Minimization of alignment errors
- Extensive trigger options
- Open interfaces for OEM software under Windows and Linux
- Compact electronics unit for mobil calibration tasks available

Digital data output – RE 10

High-speed evaluation card with buffered data output

- Number of interferometer channels: 4
- Sampling frequency: up to 12.5 MHz
- External trigger input
- RS 232C interface
- USB and RS 232C interface

Digital data output – DP 10

Fast data recording in conjunction with a PC plug-in card

- Number of interferometer channels: 4
- Sampling frequency: up to 12.5 MHz
- High-resolution FFT analysis is possible
- Support for the INFAS Vibro software for NI-PCI 6534 and NI-PCIe 6535 PC cards

Analog data output – SM 05

- 7 length measuring ranges
- 16 bit resolution with output amplitudes up to ± 3 V
- Cutoff frequency: 2 MHz
- Continuous data output

Technical Data	LSV 120 NG	LSV 2500 NG
Working distance from sensor head:	30...70, 240, 480 mm (fixed customized distance)	240 mm...2500 mm (continuously selectable)
Coherence maxima	240 mm + n·240 mm, n=0,1,2...	
Laser-spot diameter (varies with distance)	12...30, 100, 200 µm	45 µm...0,5 mm
Amplitude measurement range (depending on surface)	≤ ± 20 mm	
Resolution	5 pm	
Surface roughness	arbitrary	
Displacement speed	3 m/s	
Wavelength	632.8 nm	
Dimensions (L x W x H): • Sensor head with alignment base • Optoelektronic supply and evaluation unit (standard) • Optoelektronic supply and evaluation unit (compact)	[130 x 90 x 58] mm [450 x 400 x 150] mm [250 x 400 x 150] mm	[209 x 90 x 58] mm
Mass: • Sensor head with alignment base • Optoelektronic supply and evaluation unit (standard) • Optoelektronic supply and evaluation unit (compact)	650 g ca. 8 kg ca. 5.7 kg	1 kg
Cable length between sensor head and electronics unit:	3 m, optionally up to 10 m	
Line voltage / frequency	100...240 VAC / 47...60 Hz	
Laser safety class according to EN 60825-1:2007 and ANSI Z136.1 (CDRH)	2M II	

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