

LSV-3500

Laser Scanning Vibrometer



EPCC / PRODUCTS / APPLICATION / SOFTWARE / ACCESSORIES / CONSUMABLES / SERVICES

Analytical Technologies Limited

An ISO 9001 Certified Company

www.analyticalgroup.net

►► Description

Laser Scanning Vibrometer are state-of-the-art for noise and vibration measurement in research and development. They determine operational deflection shapes and Eigenmodes for NVH, acoustics, structural dynamics, ultrasonics and FEM validation. The high frequency version extends the application range to non-destructive evaluation (NDE) research.

The versions H, M and HV cover different frequency ranges up to 25 MHz. Scanning heads equipped with the optional LSV Xtra technology deliver high fidelity data even at large stand-off distances or on uncooperative surfaces

►► Technical data

LSV-3500-3D – Standard scope of supply

	LSV-3500-3D-H	LSV-3500-3D-M	LSV-3500-3D-HV
Vibrometer system & data acquisition	<ul style="list-style-type: none"> • LSV-I-3500 Scanning Head with high precision scanner, HD video camera and LSV-G-3500 Geometry Scan Unit • 2x LSV-I-3520 Scanning Heads • CoherenceOptimizer (Laser frequency stabilization) for all 3 scanning heads • LSV-F-3500 Front-End with 3 digital broadband decoders • LSV-E-3500 Junction Box • 3x LSV-C-3510 Main Cable, 10 m 		
	<ul style="list-style-type: none"> • data acquisition and signal generator board installed in front-end 		<ul style="list-style-type: none"> • LSV-E-3530 Junction Box • data acquisition and signal generator board installed in front-end (for H mode)
Computer	<ul style="list-style-type: none"> • LSV-W-3500 Data Management System: 19" industrial PC, wireless keyboard and mouse • Microsoft® Windows® operating system and LSV software preinstalled 		
		<ul style="list-style-type: none"> • data acquisition and signal generator board installed in PC (for V mode) 	<ul style="list-style-type: none"> • data acquisition and signal generator board installed in PC (for V mode)
Accessories	<ul style="list-style-type: none"> • LSV-A-3014 System Cabinet: Workstation and storage for all standard accessories, integrated 24" TFT Monitor with swivel stand • VIB-A-T02-S set of 3 tripods with tip-tilt head • LSV-A-CL-VID Set of Close-Up Lenses for Video Camera • Laser adjustment goggles • Manuals 		

LSV-3500 Scanning Heads

	LSV-I-3500/LSV-I-3520 Scanning Head	LSV-I-3560/LSV-I-3t570 Scanning Head Xtra
Dimensions [W x L x H]	Dimensions [W x L x H]	
Weight	LSV-I-3500: 9.2 kg (20.3 lbs) with LSV-G-3500 Geometry Scan Unit; LSV-I-3520: 9 kg (19.8 lbs)	LSV-I-3560: 9.5 kg (20.9 lbs) with LSV-G-3500 Geometry Scan Unit; LSV-I-3570: 9.3 kg (20.5 lbs)
Laser type, vibrometer	Measuring laser: HeNe, wavelength 633 nm (red), Laser power <1 mW	<ul style="list-style-type: none"> • Measuring laser: wavelength 1,550 nm (invisible), Laser power <10 mW • Pilot laser : wavelength 520 nm (green), Laser power <1 mW
Laser type, LSV-G-3500 Geometry Scan Unit	Wavelength 670 nm +/-5 nm (red); Laser power <1 mW	
Laser safety class	Class 2	
Working distance	125 mm ... ~100 m (LSV-G-3500 Geometry Scan Unit: 250 mm ... 30 m)	
Scan angle [h x v]	50° x 40°	
Scanner properties	Angular resolution <0.001°, Angular stability <0.001°/h, max. 30 scan points/s	
Sample size	From a few mm ² up to several m ²	
Camera	HD format, 30x optical zoom, max. field of view [h x v] 64° x 38°	
Interfaces, electrical	Multi-pin bayonet connector, DIN plug for pan/tilt head control or external scanner control	
Interfaces, mechanical	Hexagon type tripod adapter for VIB-A-T02, 2x M6 thread	

LSV-F-3500 Front-End

Dimensions [W x D x H]	485 x 380 x 150 mm (19", 84HP/3U)
Weight	~10 kg (~22 lbs)
Protection class	IP-20
Interfaces, electrical	Front: BNC connectors for reference channels, signal generator, trigger; Rear: multi-pin bayonet connector for main cable, monitor velocity output, RJ45 Ethernet to computer
Interfaces, mechanical	19" Rack mount adapters

LSV-E-3500 Junction Box

Dimensions [W x D x H]	485 x 60 x 150 mm (19", 84HP/3U)
Weight	~8 kg (~17.6 lbs)
Protection class	IP-20
Interfaces, electrical	4x multi-pin bayonet connector for 3 umbilical cables and interconnection to LSV-F-3500 Front-End, main cable, RJ45 Ethernet to computer
Interfaces, mechanical	19" Rack mount adapters

LSV-E-3530 Junction Box (LSV-3500-3D-HV only)

Dimensions [W x D x H]	485 x 320 x 44.5 mm (19", 84HP/1U)
Weight	1.1 kg (2.4 lbs)
Protection class	IP-20
Interfaces, electrical	Front: BNC connector for 1 reference channel, signal generator, trigger Rear: connector for vibrometer channel and to data acquisition to PC
Interfaces, mechanical	19" Rack mount adapters

LSV-A-3014 System Cabinet

Dimensions [W x D x H]	580 x 1330 x 845 mm
Weight	186 kg (incl. front-end, PC, monitor, scanning heads and cable)

General specifications

Power	100 VAC ... 240 VAC ± 10 %, 50/60 Hz; 600 VA (typical)
Environmental conditions	Operating temperature: +5 °C ... +40 °C (41 °F ... 104 °F); Storage temperature: -10 °C ... +65 °C (14 °F ... 149 °F); Relative humidity: max. 80%, non-condensing
Calibration	Every 24 months (recommended)

Compliance with standards

Electrical safety	IEC/EN 61010-1
	IEC/EN 61326-1 Emission: FCC Class A, IEC/EN 61000-3-2 and 61000-3-3 Immunity: IEC/EN 61000-4-2 to 61000-4-6 and IEC/EN 61000-4-11
Laser safety	IEC/EN 60825-1 (CFR 1040.10, CFR 1040.11)

Metrological specifications LSV-3500-3D-H

Scanning Heads	Decoder	# of ranges	Full scale (peak) m/s	Decoder frequency range	Resolution (μm/s)/√Hz	Resolution data interface ⁵ μm/s	# of reference channels	# of signal generator channels
LSV-I-3500/ LSV-I-3520 Scanning Head	DV-03	14	0.001 ... 12	0 Hz ... 100 kHz	0.01 ... 0.5	0.00048 ... 5.7	8	4
LSV-I-3560/ LSV-I-3570 Scanning Head Xtra	DV-03	14	0.0025 ... 30	0 Hz ... 100 kHz	0.01 ... 0.15	0.0012 ... 14	8	4

Metrological specifications LSV-3500-3D-M

Scanning Heads	Decoder	# of ranges	Full scale (peak) m/s	Decoder frequency range	Resolution (μm/s)/√Hz	Resolution data interface ⁵ μm/s	# of reference channels	# of signal generator channels
LSV-I-3500/ LSV-I-3520 Scanning Head	DV-04	14	0.001 ... 12 ²	0 Hz ... 1 (2) ⁴ MHz	0.01 ... 3	0.0038 ... 458	1	1
LSV-I-3560/ LSV-I-3570 Scanning Head Xtra	DV-04	14	0.0025 ... 30 ³	0 Hz ... 1 (2) ⁴ MHz	0.01 ... 8	0.095 ... 1144	1	1

Metrological specifications LSV-3500-3D-M

Scanning Heads/ Acquisition Mode	Decoder	# of ranges	Full scale (peak) m/s	Decoder frequency range	Resolution (μm/s)/√Hz	Resolution data interface ⁵ μm/s	# of reference channels	# of signal generator channels
LSV-I-3500/ LSV-I-3520 Scanning Head/ V mode	DV-08	14	0.001 ... 12 ²	0 Hz ... 25 MHz ⁶	0.01 ... 18	0.038 ... 458	1	1
LSV-I-3500/ LSV-I-3520 Scanning Head/ H mode	DV-08	14	0.001 ... 12	0 Hz ... 100 kHz	0.01 ... 0.5	0.00048 ... 5.7	8	4
LSV-I-3560/ LSV-I-3570 Scanning Head Xtra/ V mode	DV-08	14	0.0025 ... 30 ³	0 Hz ... 25 MHz ⁶	0.01 ... 48	0.095 ... 1144	1	1
LSV-I-3560/ LSV-I-3570 Scanning Head Xtra/ H mode	DV-08	14	0.0025 ... 30	0 Hz ... 100 kHz	0.01 ... 0.15	0.0012 ... 14	8	4

Options and accessories

LSV-A-3526 Front Window	Protects the scanning mechanism against dust, wind and acoustic excitation at high dB levels.
LSV-C-5xx Main Cable	LSV-C-5xx Main Cable

Options and accessories

LSV-A-T34 Table Tripod	Rigid support of 3 LSV scanning heads. Provides a configuration optimized for in-plane performance with small parts.
LSV-A-T35 Table Tripod	Rigid support of 3 LSV scanning heads. Provides a narrow configuration optimized for out-of-plane performance with small parts.
LSV-A-3450 Reference Object	Facilitates high-precision 3D alignment of the sensor heads. Recommended for small measurement objects and dynamic strain and stress analyses.
LSV-A-HNeBF Helium-Neon Block Filter ¹	Notch filter for improved laser spot visibility when measuring very small parts or mirror-like surfaces.

Accessories for (brake) acoustics and modal analysis

LSV-A-T51 Motorized Tripod	Convenient motorized support for 3 LSV scanning heads
LSV-A-3430 Acoustic Gate Unit	Activates the gate input if a noise exceeds a certain threshold
LSV-A-MIR-S001/ A-MIR-S002 Mirror Set	Mirror set for measurements in difficult-to-access areas. The mirror set comprises 4 (LSV-A-MIR-S002: 5) front coated mirrors including magnetic fixtures.



LSV-I-3550 Scanning Head Xtra as upgrade for highest optical sensitivity



LSV-A-T34 Table Tripod



LSV-A-3526 Front Window protects the scanning unit

►► Software options

Model	LSV-3500-3D Scanning Vibrometer	-H	-M	-HV
Preparation				
APS Professional	For arbitrary definition of measurement points and individual object properties	S	S	S
Geometry Data Import	Geometry module for importing geometry data to the LSV software for defining the scan points	S	S	S
VideoTriangulation [®]	Image processing for enhanced automatic alignment of the laser spot with the grid points	S	S	S
Measurement				
High Resolution Scan	Up to 512 x 512 scan point density for higher spatial resolution	S	S	S
FastScan	Fast scan routine for analyzing the response of structures at a single frequency	S	S	S
Time Domain Animation	Time domain data are acquired while scanning. Allows for "slow motion" animation e.g. of surface waves propagation or switches.	O	O	O
Extended FFT Lines	Various options to extend the number of FFT lines up to 819,200	O	O	O
Multi Frame	For triggered measurements on combustion engines and brakes	O	-	O ¹
Bandwidth Extension	Extends the acquisition bandwidth to 2 MHz	-	O	-
Gate Input	Allows gated measurements with external TTL signal	S	S	S
Measurement				
SignalProcessor	The user interface to the math library included in the LSV software, designed as an easy-to-use spreadsheet	S	S	S
UFF Interface	Universal File Format data conversion from and to major modal analysis and Finite Element packages	S	S	S
PCA	Principal Component Analysis. For MIMO measurements in experimental modal analysis.	O	-	O ¹
PolyWave Software Suite	Scalable post-processing software suite for comprehensive analysis of vibration test data. Comprises modules for experimental modal analysis, operational modal analysis and order analysis.	O	O	O
Data Export to ME'scope	Data export to Vibrant's ME'scope modal analysis software	O	O	O
ASAM ODS	Import and export of data in ASAM ODS 5.3.0 ATFX standard	O	O	O
StrainProcessor	Post processing of measurement data for calculation of dynamic strain and stress. Stand-alone software component. Visualization of the results in LSV software.	O	O	O
Desktop Analysis Version	Desktop version of LSV software for offline post processing and presentation of measurement results	O	O	O
Automation and programming interface				
Macro Programming	WinWrap [®] Basic Engine: Visual Basic [®] for Applications (VBA) compatible. Allows automation of test routines.	S	S	S
Polytec File Access	API for retrieval of Polytec data via external applications supporting Microsoft's Component Object Model (COM), e.g. Visual Basic .NET [®] , C#, MATLAB [®] , LabVIEW [™]	S	S	S

►► Software options

Model	LSV-3500-3D Scanning Vibrometer	-H	-M	-HV
Maintenance package				
Software Maintenance Basic	Basic software maintenance. Free LSV software updates for a period of 1 year	S	S	S
Extended Software Maintenance	Entitles for software updates for an additional period. Available in 12 month increments.	O	O	O
University Program	Lifetime update license for universities and education (terms and conditions apply)	O	O	O
Software macros				
RotoVib Macro	LSV software macro facilitating 3D vibration measurements on multiple sides of a sample with the aid of a turntable ²	O	O	O
Application specific macros	Polytec offers a range of software macros dedicated to specific measurement tasks, e.g. for measurement on break disks. Polytec gladly supports you in the development of new macros tailored to your needs.	O	O	O

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Reader/Washer



URINOVA 2800
Urine Analyzer



Total Organic
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