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INSTRUMENTS

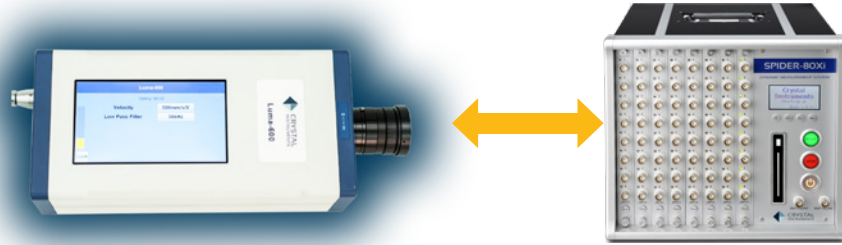
LUMA-600 LASER VIBROMETER

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lens side view

Luma-600 Laser Vibrometer



Seamless Integration with Spider Series

The Luma-600 is a high-precision, single-point laser vibrometer designed for seamless integration with Crystal Instruments' Spider series dynamic measurement systems and EDM software. With exceptional synchronization, featuring a time lag and phase match of less than 1 degree across a 50 kHz frequency range, it delivers unmatched accuracy in dynamic signal measurement, vibration control, and structural diagnostics.

Portable & Effortless Operations

Engineered for portability and ease of use, the Luma-600 provides pinpoint accuracy with minimal setup, making it ideal for research, industrial maintenance, and quality control. Its lightweight, compact design ensures effortless operation, while real-time data acquisition, low power consumption, and high-resolution measurements guarantee reliable performance in demanding environments.

Laser Doppler Technology

Utilizing advanced laser Doppler technology, the Luma-600 offers highly precise, non-contact vibration measurements for structural health monitoring, machine diagnostics, and material characterization. The integrated 7-inch touchscreen control box provides an intuitive interface for real-time visualization and seamless operation.

Combine with Data Acquisition

Supporting analog outputs, the Luma-600 is fully compatible with modern data acquisition systems. Features such as low-pass filters, a reflective signal strength display, and Ethernet connectivity enhance measurement precision and efficient data transfer, optimizing workflow for vibration analysis.

Uncompromising Quality

Built to meet the highest industry standards, the Luma-600 is an indispensable tool for professionals in aerospace testing, automotive research, industrial maintenance, and material characterization.

Key Features

- Single-point, non-contact vibration measurement using advanced laser Doppler technology for superior accuracy with minimal signal distortion and ultra-low noise making it ideal for delicate and high-speed surfaces
- Lightweight design with a 7-inch intuitive touchscreen interface, ensuring seamless operation in both field and laboratory environments.
- Fully compatible with Crystal Instruments' Spider dynamic measurement platforms for synchronized data acquisition and analysis.
- Ideal for structural health monitoring, machine diagnostics, industrial maintenance, and research applications across multiple industries.
- Equipped with BNC interfaces supporting analog data transmission.
- Covers a DC to 50 kHz range, accommodating a variety of testing environments and applications.
- **IP54-rated** protection ensures resistance to dust and moisture, making it suitable for harsh laboratory and industrial conditions.

Technical Specifications

Measurement Specifications	Details
Analog Signal Outputs	BNC connector ($\pm 10\text{ V}$ @ $50\ \Omega$) for simultaneous analog signal outputs and phase-synchronized output of velocity
Frequency Bandwidth	DC to 50 kHz
Maximum Velocity	$\pm 5\text{ m/s}$
Resolution	Velocity: $0.01\ \mu\text{m/s}/\sqrt{\text{Hz}}$
Velocity Range	$\pm 50\text{mm/s}$, $\pm 500\text{mm/s}$, $\pm 5000\text{mm/s}$
Maximum Linear Error	$<\pm 1\%$
Signal Level	Reflective signal strength display; output as DC voltage signal (BNC, 0~5 V)
Analog Input Signals	CLEAR function to reset displacement signal to zero

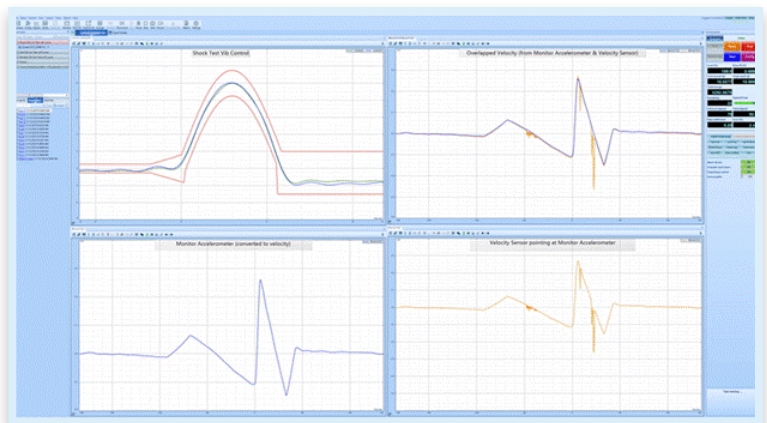
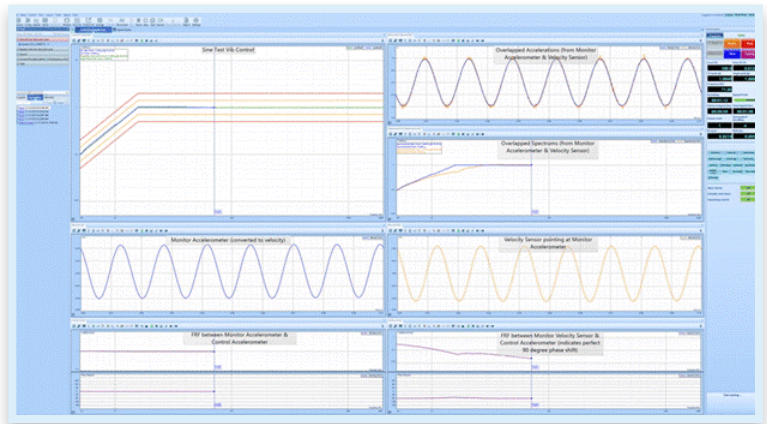
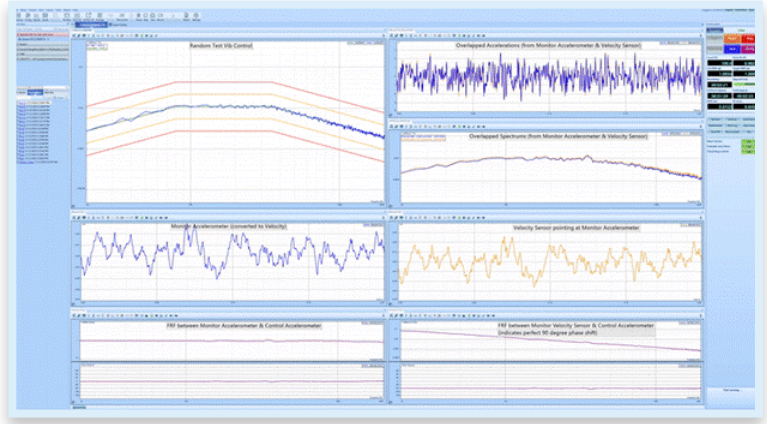
Optical Specifications	Details
Laser Type	Helium-Neon (HeNe)
Laser Class	Class A, $<2\text{ mW}$
Laser Wavelength	632.8 nm
Focus	Manual focus
Working Distance	0.35 m to 20 m
Laser Spot Size	Varies by distance: (Distance vs Spot Diameter) 350 mm – $30\ \mu\text{m}$ 500 mm – $44\ \mu\text{m}$ 750 mm – $64.7\ \mu\text{m}$ 1000 mm – $76.7\ \mu\text{m}$ 1500 mm – $130.7\ \mu\text{m}$ 2000 mm – $147.1\ \mu\text{m}$ 3000 mm – $229.5\ \mu\text{m}$ 5000 mm – $370.4\ \mu\text{m}$

General Specifications	Details
Model	Luma-600
Components	Sensor, Control Box
Dimensions	$382 \times 160 \times 94\text{ mm}$
Weight	4.7 kg
Protection	IP54 for both Sensor and Control Box
Interface	Aviation plug
Operating Temperature	$+3\text{ }^{\circ}\text{C}$ to $+45\text{ }^{\circ}\text{C}$
Storage Temperature	$-10\text{ }^{\circ}\text{C}$ to $+65\text{ }^{\circ}\text{C}$
Power Supply	DC $12\text{V} \pm 10\%$ adapter
Power Consumption	Maximum 50 W
Output physical quantity	Velocity
Portability	It can be equipped with a multi-degree-of-freedom bracket, a customized carrying case, a portable power supply, and outdoor and field measurements.
Host size	Less than or equal to $382\text{ (length)} \times 160\text{ (width)} \times 94\text{ (height)}\text{ mm}$

Software Applications for Spider Hardware Platform



- EDM Vibration Controller (VCS) Mode Software (computer-based)
- EDM Dynamic Signal Analyzer (DSA) Mode Software (computer-based)
- EDM Modal (Experimental Modal Analysis) (computer-based)
- EDM Remote Condition Monitoring Software (computer-based) (DSA-40)
- EDM Time Data Acquisition (computer-based) (TDA-10)
- Post Analyzer (computer-based post processing software)
- EDM Cloud support (Cloud based Monitoring)
- LabVIEW Driver
- Python API (cross platform utility)



Testing Example

To demonstrate the functionality of the Luma-600 laser scanner vibrometer, three vibration control tests—Random, Sine, and Shock—are performed using both a control and a monitor accelerometer. During testing, the Luma-600 laser beam is directed at the monitor accelerometer. The time-domain and spectral data from the accelerometer and the laser vibrometer are then compared, showing strong alignment. This confirms the non-contact system's accuracy and efficiency.



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