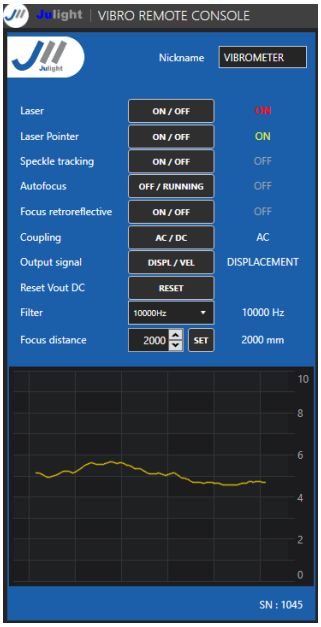
VSM-1000 Series
SINGLE-HEAD
LASER VIBROMETERS

- *Self-Mixing Interferometric Configuration for non-contact vibrations measurement*
- *Frequency range from DC to 50 kHz (optional to 3 MHz)*
- *Standard distance: 0.1-2.0m*
- *Long distance: 0.2-5.0/10/20m*
- *Small-size optical head*
- *Easy beam alignment with automatic speckle-tracking and Autofocus Systems*
- *Class 2 Laser*
- *Works on All Diffusive Surfaces*
- *Remote Console Software*



Laser Vibrometers from Julight

Julight VSM 1000-EXT Laser Vibrometer allows easy and accurate non–contact vibration measurements on all rough and diffusive surfaces (e.g.: unfinished metal, plastic, rubber, paper, fabric, etc.). It provides an analog electrical output which is a replica of the target displacement or velocity, in an extended frequency range from DC to 3 MHz (in two separate bands: 0-50kHz and 20kHz-3MHz).

Principle of Operation

Julight Laser Vibrometers are based on the novel self–mixing interferometric scheme, and make use of a compact semiconductor diode laser. While conventional Laser Doppler Vibrometers/Velocimeters (LDVs) use the complex Michelson interferometric configuration, the self–mixing scheme is based on the coherent interference of the backscattered light directly into the laser diode, allowing for a reduced optics count. Julight Laser Vibrometers have a high sensitivity, which allows correct operation even for weak intensities of the light backscattered by the diffusive target surface.

Applications

- Non-contact measurement of vibrations
- Automotive, Aerospace, and Mechanical Industry
- Vibration measurement without mass-loading on small, soft and delicate structures
- Loudspeaker and piezoceramic testing
- Material analysis and Modal analysis
- On–line process & quality control in industrial plants

Use

The laser beam shall be aimed at the target surface, and the vibration signal is readily available from the output BNC connector. AutoFocus and Automatic Speckle-Tracking functionality allow unattended operation on any diffusive surface, while an LED-bar indicator measures optical signal strength in real-time. The vibration signal can be displayed onto an oscilloscope, or supplied to a FFT analyzer for frequency domain analysis.

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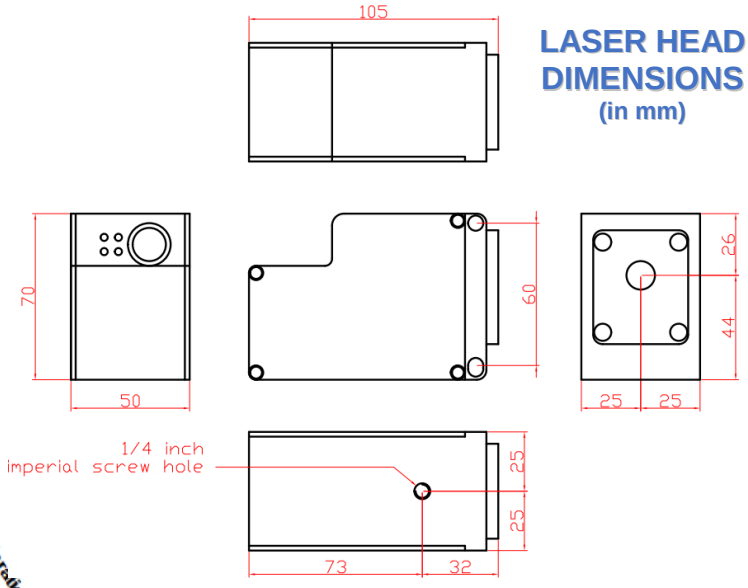
Performance	0 – 50 kHz	20 kHz – 3 MHz
Maximum measurable vibration (peak-to-peak)	43 mm (theoretical) 10 mm (practical)	4 µm
Maximum measurable velocity	> 0.5 m/s	40 m/s
Output signals	• Displacement / Velocity (analog, BNC connector) • Monitor (3.5mm jack): - Optical Signal Level (analog) - Speckle-Tracking active (digital)	
Output signal responsivity	• Displacement: 0.5 V/mm • Velocity: 5 V/(m/s)	5 V/µm
Resolution	Noise-limited	
Noise Equivalent Displacement	0.04 nm/√Hz @ 0.5 m	
Output signal accuracy	1 %	5 %
Spatial transverse resolution	100 µm	
Target surface	Diffusive or back-reflecting	
Working distance	from 10cm to 200cm	

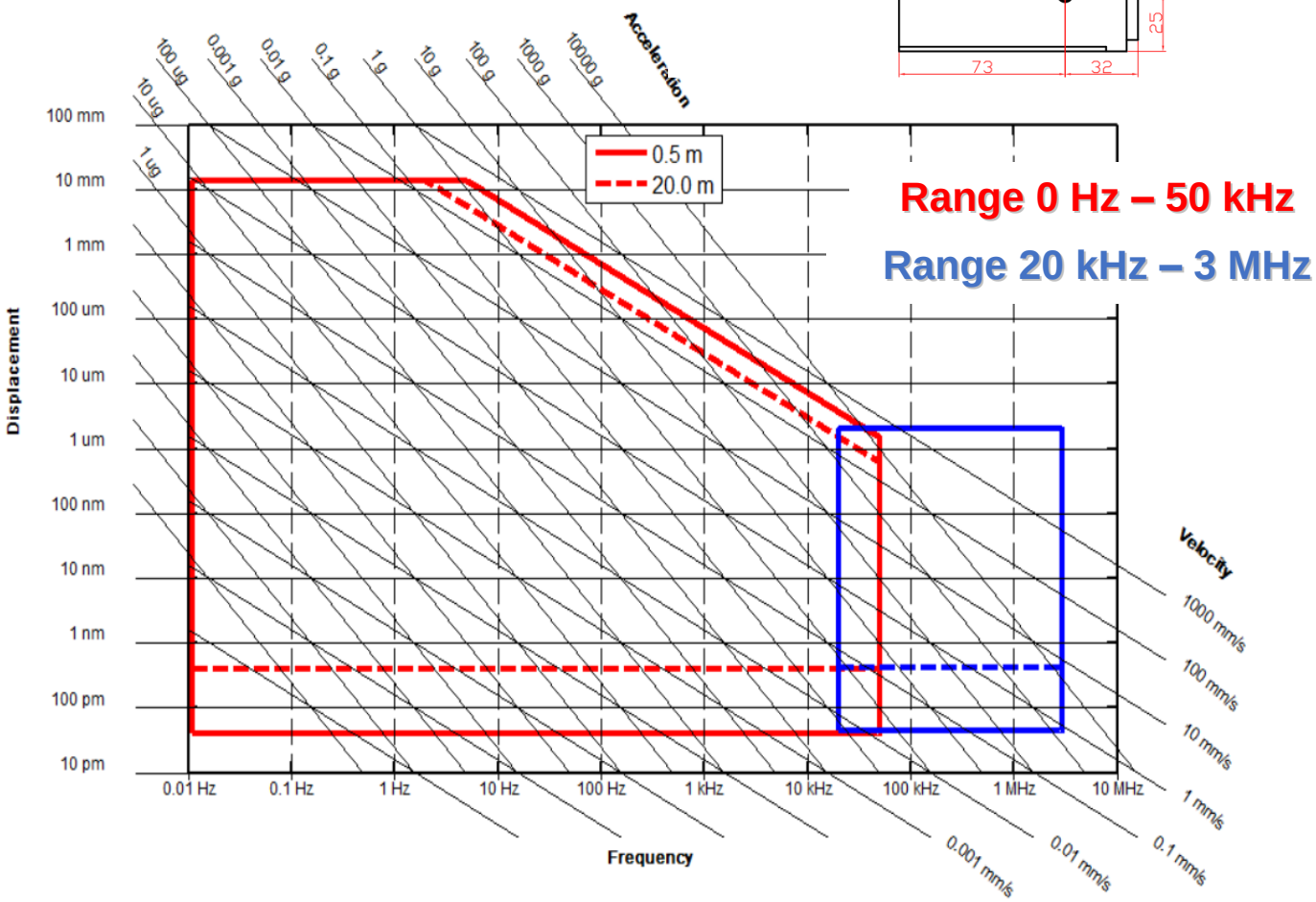
Physical	
Laser radiation	• Pout < 1 mW @ 650 nm (collimated) • Pout < 15 mW @ 1310 nm (focused)
Laser safety class	• Class 2 @ 650 nm (visible) • Class 1M @ 1310 nm (invisible)
Optical head dimensions	50 mm x 70 mm x 105 mm
Electronic unit dimensions	12.5 cm x 15.5 cm x 29.6 cm
Optical head cable length	2.5 m (5 m optional)
Power supply	• 110-120 VAC / 60 Hz • 220-240 VAC / 50 Hz
Power consumption	< 5 W
I/O	USB 2.0 (for remote control from PC)
Weight	4 kg
Temperature (operating)	Optical head: -20 °C to +80 °C Main unit: 0 °C to +50 °C

VISIBLE AND INVISIBLE LASER RADIATION
DO NOT STARE INTO THE BEAM
CLASS 2 LASER PRODUCT
λ = 650 ± 10 nm ; P max. < 1 mW
λ = 1310 ± 10 nm ; P max. < 15 mW
(according to IEC 60825-1:2007)

LASER HEAD DIMENSIONS (in mm)



MEASURABLE VIBRATIONS



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