optomet.
LASER VIBROMETRY

Digital Velocity Decoder
D-VD-1

Ultrafast FPGA-based Digital Signal Processing

Optomet Vibrometers feature an end-to-end FPGA-based digital signal processing allowing a fully digital read-out of the measurement data. Digital signal processing avoids any drawbacks of analog demodulation which may result from component aging, temperature dependencies, noise and non-linearities. Significantly higher sensitivity, better resolution, and stability are the benefits of OptoMET's end-to-end digital signal processing. Extremely low noise levels produce precise results even from poorly reflecting measurement objects.

HIGHLIGHTS:

- Digital decoder
- 8 velocity measuring ranges
- Frequency range: 0 Hz - 500 kHz
- Max. velocity up to 2 m/s
- Resolution down to 6 nm $s^{-1}/\sqrt{Hz}$
- Max. linearity error: 0.5 %

Universal Basis Velocity Decoder

All vibrometers series feature by default a velocity decoder and can be supplemented with a suitable displacement and/or acceleration decoder.

The D-VD-1 velocity decoder is the versatile solution for various types of non-contact vibration metrology tasks. With its 8 velocity measuring ranges, it can measure up to 500 kHz and thus well above the audible acoustic range. Digital signal processing provides excellent linearity and measuring accuracy.

Technical data

Pos.	Full Scale Output (Peak) m/s	Typical Resolution* µm s^{-1} / √Hz	Signal Frequency Range kHz	Max. Acceleration g
1	0.01	0.006	25	160
2	0.02	0.008	50	640
3	0.05	0.015	100	3,200
4	0.1	0.035	250	16,000
5	0.2	0.08	500	64,000
6	0.5	0.20	500	160,000
7	1	0.26	500	320,000
8	2	0.35	500	640,000

* The resolution is defined as the signal amplitude (rms) that produces 0 dB signal/noise ratio with 1 Hz spectral resolution at 50 % f $_{max.}$

Range diagram