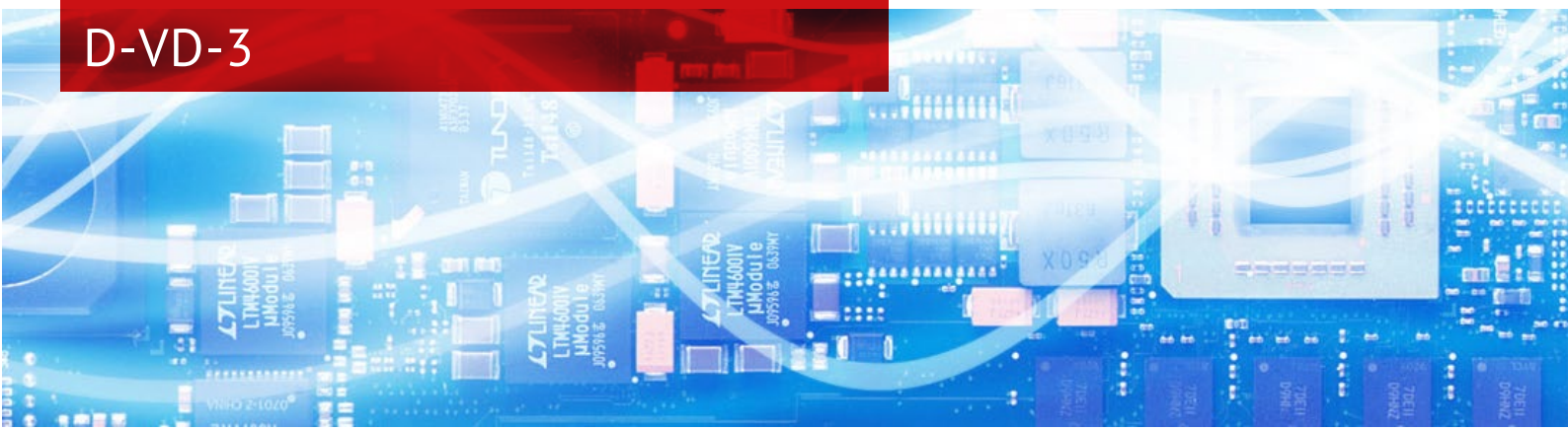
optomet.
LASER VIBROMETRY

Digital Velocity Decoder

D-VD-3



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
- 11 velocity measuring ranges
- Frequency range: 0 Hz - 2.5 MHz
- Max. velocity up to 10 m/s
- Resolution down to 6 nm $s^{-1}/\sqrt{Hz}$
- Max. linearity error: 0.5 %

High Speed 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-3 high-speed velocity decoder with 11 measuring ranges can measure from 6 nm/s to 10 m/s. The maximum permissible acceleration is 16,000,000 g, and the working frequency range is between DC and 2.5 MHz. It is thus suitable for both high-frequency measurements in microsystems engineering as well as for structural dynamics investigations with large vibration amplitudes, e.g. in the automotive industry.

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	1,000	320,000
7	1	0.26	1,500	960,000
8	2	0.35	2,500	3,200,000
9	5	0.37	2,500	8,000,000
10	8	0.37	2,500	12,800,000
11	10	0.38	2,500	16,000,000

* 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