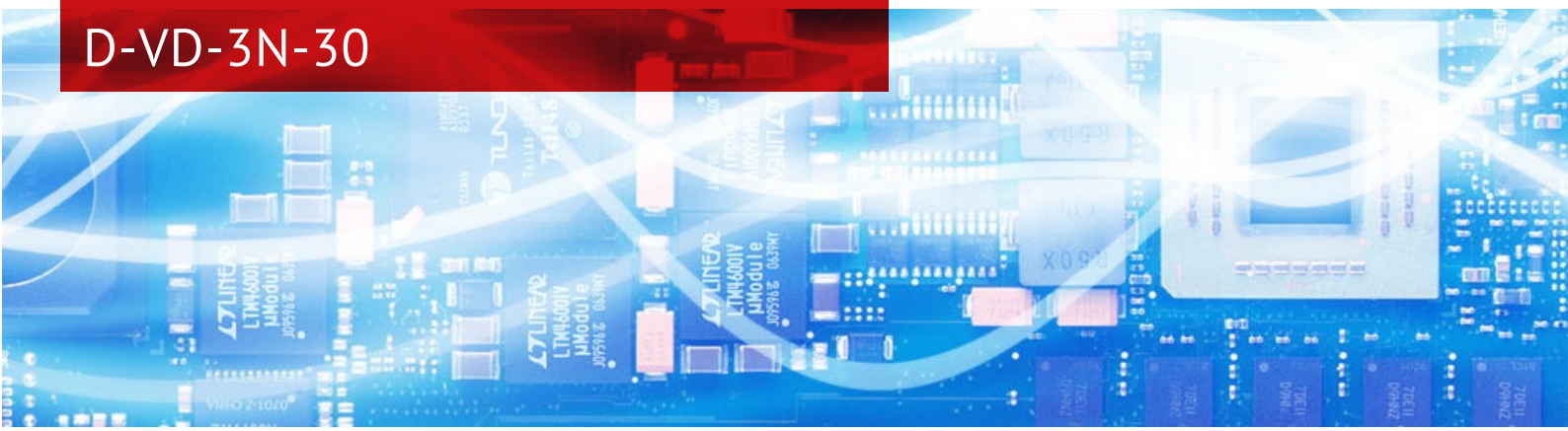
optomet.
LASER VIBROMETRY

Digital Velocity Decoder

D-VD-3N-30



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
- 12 velocity measuring ranges
- Frequency range: 0 Hz - 2.5 MHz
- Max. velocity up to 30 m/s
- Resolution down to 12 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-3N-30 ultra high-speed velocity decoder with 12 measuring ranges can measure from 24.5 mm/s to 30 m/s. The maximum permissible acceleration is 40,000,000 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	0.0245	0.012	25	392
2	0.049	0.018	50	1,560
3	0.1225	0.024	100	7,800
4	0.245	0.05	250	39,200
5	0.49	0.10	500	156,000
6	1.225	0.20	1,000	784,000
7	2.45	0.29	1,500	2,350,000
8	4.9	0.47	2,500	7,840,000
9	12.25	2.4	2,500	19,600,000
10	19.6	1.2	2,500	31,300,000
11	25	0.64	2,500	40,000,000
12	30	0.06	100	1,920,000

* 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