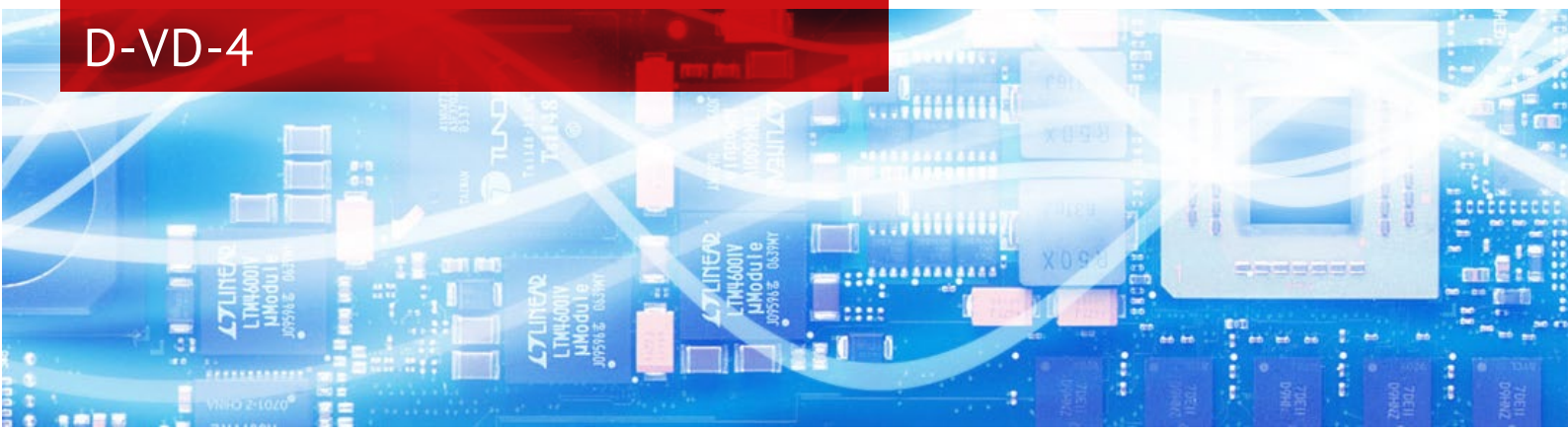
optomet.
LASER VIBROMETRY

# Digital Velocity Decoder

## D-VD-4



### 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
- 9 velocity measuring ranges
- Frequency range: 0 Hz - 10 MHz
- Max. velocity up to 5 m/s
- Resolution down to 6 nm $s^{-1}/\sqrt{Hz}$
- Max. linearity error: 0.5 %

### High Frequency 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-4 HF velocity decoder is the optimum solution for high-frequency processes up to 10 MHz. This fast digital decoder can measure vibration velocities between 6 nm/s and 5 m/s. It combines a large range of measuring frequencies with an excellent resolution. With its maximum permissible acceleration of 32,000,000 g, it is predestined for applications in microsystems engineering.

# Technical data

| Pos. | Full Scale Output (Peak)<br>m/s | Typical Resolution*<br>µm s $^{-1}$ / √Hz | Signal Frequency Range<br>kHz | Max. Acceleration<br>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 | 1000 | 320,000 |
| 7 | 1 | 0.26 | 1500 | 960,000 |
| 8 | 2 | 0.35 | 2500 | 3,200,000 |
| 9 | 5 | 0.37 | 10000 | 32,000,000 |

* 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