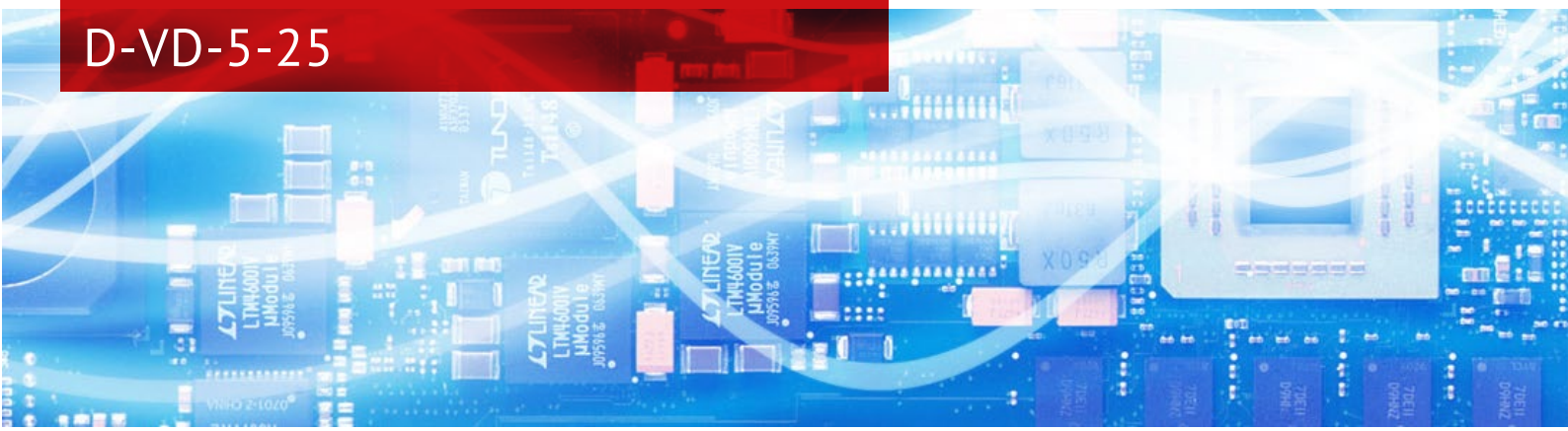
optomet.
LASER VIBROMETRY

Digital Velocity Decoder
D-VD-5-25



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
- 14 velocity measuring ranges
- Frequency range: 0 Hz - 25 MHz
- Max. velocity up to 10 m/s
- Resolution down to 1.3 nm $s^{-1}/\sqrt{Hz}$

High-End Master Velocity Decoder 25 MHz

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

The D-VD-5-25 velocity decoder expands the frequency bandwidth up to 25 MHz, is especially used for ultrasonic applications. It is compatible with displacement decoder D-DD-5-25.

Technical data

Pos.	Full Scale Output (Peak) m/s	Typical Resolution*1 µm s $^{-1}$ / √Hz	Signal Frequency Range kHz	Max. Acceleration g
1	0.001	0.0013	2.5	1.6
2	0.002	0.0026	5	6.4
3	0.005	0.004	10	32
4	0.01	0.006	25	160
5	0.02	0.008	50	640
6	0.05	0.015	100	3,200
7	0.1	0.035	250	16,000
8	0.2	0.08	500	64,000
9	0.5	0.20	1,000	320,000
10	1	0.26	1,500	960,000
11	2	0.35	2,500	3,200,000
12	5*2	1.43	25,000	32,000,000*3
13	8	0.70	5,000	25,600,000
14	10	0.38	2,500	16,000,000

*1 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}.

*2 Velocity limited to 0.5 m/s at frequencies above 10 MHz.

*3 Acceleration limited to 7,680,000 g at frequencies above 10 MHz.

Range diagram