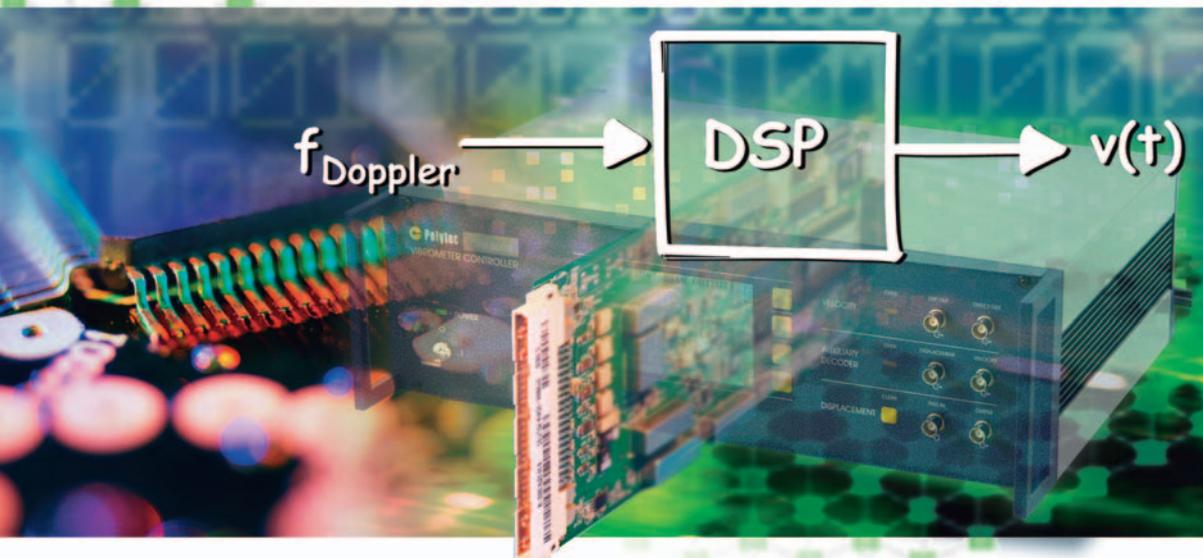


VD-06 Digital Velocity Decoder



MODULAR VIBROMETER SYSTEM

- OFV-5000 Vibrometer Controller
 - Velocity Decoders
 - Displacement Decoders
- OFV-505/503 Standard Sensors
- OFV-511/512 Fiber-Optic Sensors

MEASURING VIBRATION VELOCITY

Signal processing is one of the most sensitive parts of any Laser Doppler Vibrometer system. The quality of dedicated velocity decoders available for the OFV-5000 Controller defines the accuracy, linearity, sensitivity and signal-to-noise ratio of the system.

Velocity Decoding in Laser Vibrometer Systems

Polytec Laser Doppler Vibrometers operate on the Doppler principle, measuring back-scattered laser light from a vibrating structure, to determine its vibrational velocity and displacement. A vibrometer system comprises controller electronics and a non-contact standard-optic or fiber-optic sensor head. The controller provides signals and power for the sensor head, and processes the vibration signals. These are electronically converted by specially developed decoders within the controller to obtain velocity and displacement information about the test structure. A vibrometer system based on the OFV-5000 Controller can measure vibration frequencies from 0 Hz up to 20 MHz. Velocities can be as small as 0.1 $\mu\text{m/s}$ up to 10 m/s. Different measurement ranges demand appropriate decoders. To meet this demand Polytec offers a range of analog and digital decoders with different characteristics. Two velocity decoders can be operated simultaneously.

The VD-06 Digital High-Precision Velocity Decoder

The VD-06 decoder uses digital signal processing (DSP) technology to enhance its performance. Vibration measurements can be taken with exceptional precision and resolution. In addition to the usual analog voltage output, the VD-06 features an S/P-DIF interface that passes 24-bit digital data (freq. up to 42 kHz) to appropriate data loggers or Polytec's VibSoft-SP. The VD-06 can be installed side-by-side with the popular VD-02 decoder to give an optimum decoder combination. It is also required for the operation of the DD-500 displacement decoder.

Key features of the VD-06

- DSP-based, high precision velocity decoder
- Large bandwidth 0 to 350 kHz
- Outstanding linearity and frequency response
- 3 velocity ranges: 20 mm/s, 100 mm/s and 500 m/s full scale peak
- Best resolution: $< 0.05 \mu\text{m s}^{-1} / \sqrt{\text{Hz}}$

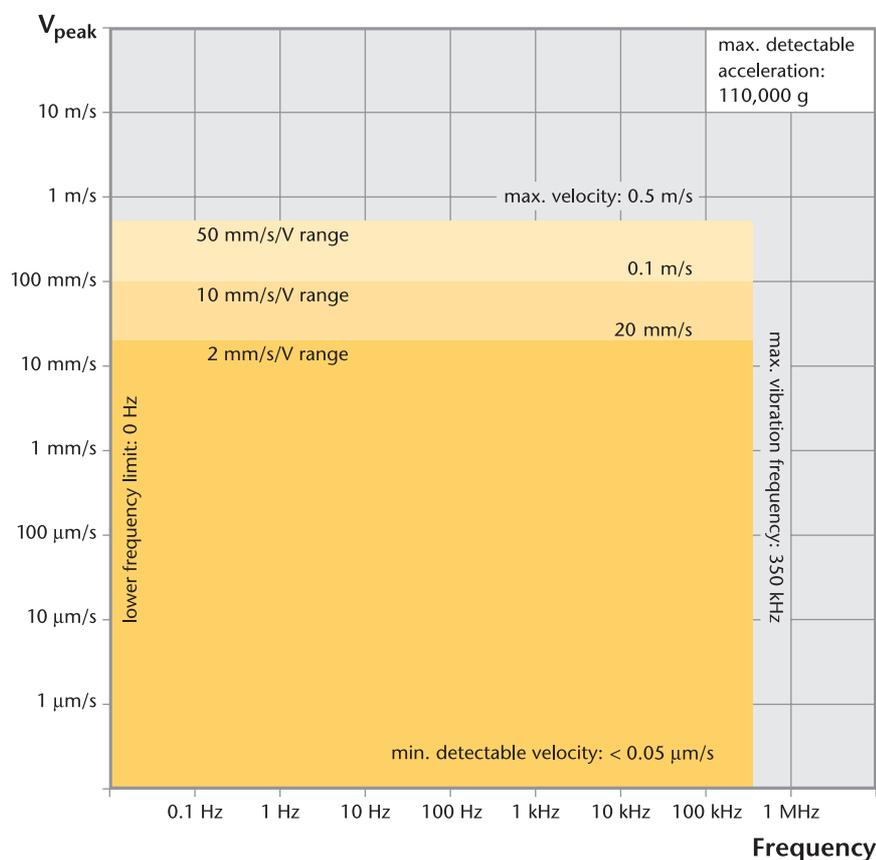
VD-06 Technical Data

Measurement Range	Full Scale Output (Peak)*	Resolution**	Signal Frequency Range	Max. Acceleration	Max. Linearity Error
mm/s/V	m/s	$\mu\text{m s}^{-1}/\sqrt{\text{Hz}}$	Hz	g	% of reading
2	0.02	0.05	0 – 350 k	4,500	0.1
10	0.10	0.05	0 – 350 k	22,000	0.1
50	0.50	0.10	0 – 350 k	110,000	0.1

* The full scale values correspond to the maximum output voltage of 10 V_{peak}.

** 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}.

VD-06 Range Diagram



Data Acquisition

For PC-based data acquisition and processing, VibSoft software is recommended. The S/P-DIF interface on the VD-06 allows the VibSoft-SP software to work directly with digital data up to 18 kHz. This improvement also eliminates the cost of a typical A/D card. If higher frequency response is needed, VibSoft-1000 and VibSoft-1004 offer comprehensive software/hardware packages for dual and quad channel data acquisition from 0 to 1 MHz. VibSoft-80 and VibSoft-84 are available for lower frequencies and cover dual and quad channels up to 80 kHz.

For more information on selection and combination of signal decoders please see OFV-5000 and Decoder Guide data sheets, or contact your local vibrometer sales/application engineer.

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