Polytec

Portable Digital Vibrometer PDV-100

High Resolution Digital Velocity Measurement

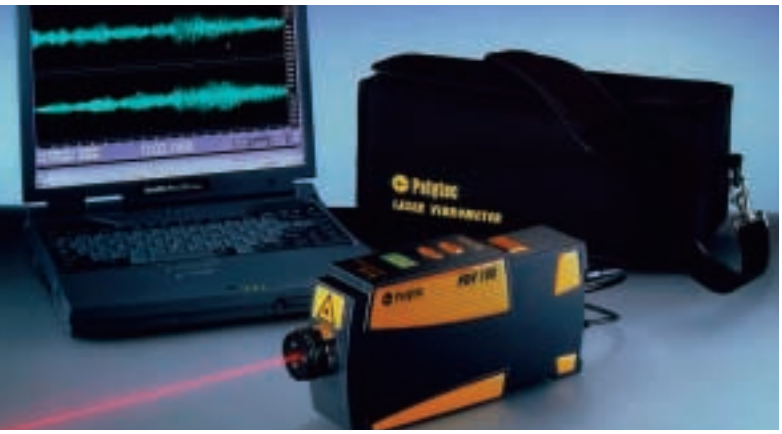
- Portable
- Robust
- Lightweight

PDV-100

Introduction

Polytec's PDV-100 Portable Digital Vibrometer measures surface vibration velocity without contact, utilizing Laser Doppler Vibrometry (LDV) technology.

The unique combination of state-of-the-art optics, digital signal processing and Polytec design experience yields excellent measurement performance, ease-of-use and long-term calibration stability in a truly portable and robust package.



PDV-100 with transportation bag and laptop based signal-processing using S/P-DIF interface

Features

- Non-contact velocity measurement in the frequency range 0 to 22 kHz
- 3 velocity ranges for highest resolution
- Digital signal processing
- Analog and digital signal outputs
- Variable working distance from 0.2 m up to 30 m
- Eye-safe visible laser
- Lightweight, ergonomic and rugged design, hermetic housing
- Low power consumption (batteries, wide voltage range AC mains adapter)

Working with the PDV-100 is easy

Vibration measurements are made easy with the PDV-100. After focusing the laser beam on the vibrating object the measurement range is set via only two push buttons. An illuminated liquid crystal display shows the selected range, the amount of light returning to the PDV-100, and, if applicable, velocity over-range and low-battery warnings.

Selectable high and low pass frequency filters condition the velocity signal to suppress low-frequency background vibrations or unwanted high-frequency signals.

The analog velocity output interfaces to conventional analog signal processing and recording equipment. The digital velocity signal uses a transmission method proven in digital audio technology. It interfaces to digital inputs of modern recording devices or signal analyzers without any loss of accuracy.

Available accessories include the PDV-BS transportation bag with integrated lithium ion batteries for nominal five hours operation time and the OFV-S2 tripod.

Advantages of digital signal processing

The PDV-100 digital signal processing provides superior performance:

- Improved velocity resolution
- Outstanding measurement linearity and accuracy
- Demodulation principle independent of aging and environmental influences
- Unequalled long-term calibration stability
- Digital low pass output filters with excellent properties
- Digital signal interface to data storage or processing guarantees data accuracy and minimizes EMC interference

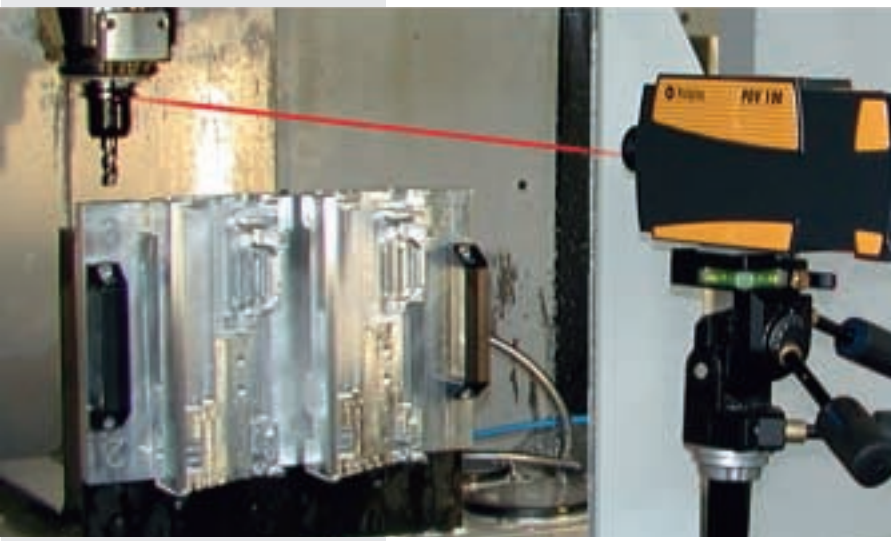
Scientific expedition using PDV-100 for vibration measurement of bees in South America jungle (Photo credit: Jarau/Hrncir, Institute of Zoology, Dept. of Neurobiology, Vienna University, Austria)

A reliable tool for many applications

If you need a portable multi purpose non-contact vibration measurement system the PDV-100 is the ideal solution. In combination with lightweight signal processing equipment and the PDV-BS transportation bag providing power, machinery vibrations, difficult to access or hazardous objects can conveniently be measured.

The PDV-100 is designed for non-contact vibration measurements where mobility and durability are important:

- Predictive maintenance of machinery
- Operating vehicles, trains or airplanes
- Buildings, bridges or other large outdoor structures
- Multi purpose field testing
- Scientific expeditions



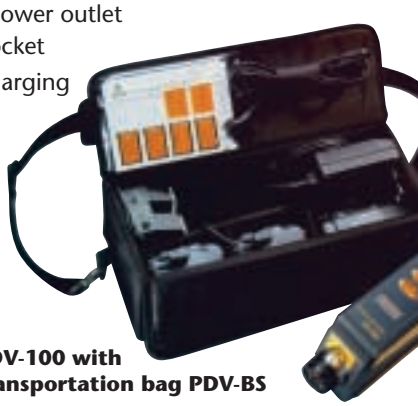
Predictive maintenance vibration measurements of machinery

PDV-100 Standard and Optional Accessories

Included with PDV-100 are AC/DC power adapter (100–240 V AC, 50/60 Hz) with connecting cable, transportation bag, digital interface (S/P-DIF) cable (Triax / RCA), 1 sheet of reflective tape.

Optional

- PDV-BS battery supply kit with transportation bag. Integrated lithium ion battery set (rechargeable), battery charger (100–240 V AC, 50/60 Hz) with mains cable and switching box. Weight and dimensions (including PDV-100): 4.4 kg, 370 mm x 160 mm x 150 mm
- PDV-DC cable for operating PDV-100 from a 12 V vehicle power outlet or cigarette lighter socket
- PDV-DCR cable for charging the battery kit from a 12 V vehicle power outlet or cigarette lighter socket
- OFV-S2 tripod with fluid stage



PDV-100 with transportation bag PDV-BS

Polytec

PDV-100 General Specifications

Measurand	Velocity		
Signal processing	Digital		
Frequency range	0 – 22 kHz		
Velocity measurement ranges	3		
Peak velocity (mm/s)	± 20	± 100	± 500
Scaling factor (mm/s/V)	5	25	125
Velocity resolution [1] (µm/s rms)	< 0.05	< 0.1	< 0.3
Working distance [2]	0.2 to 30 m		
Laser safety	Eye safe class II visible HeNe laser		
Operating temperature range	+5 to +40 °C		
Relative humidity	max. 80 %, non-condensing		
PDV-100 Output Signals			
Output signal types	Analog and Digital		
Analog velocity output	BNC connector		
Output voltage range	± 4 V, 24 bit DAC		
Frequency range	0.5 Hz – 22 kHz		
Dynamic range [3]	> 90 dB		
Calibration accuracy	± 1 % (20 Hz – 22 kHz)		
Output impedance	50 Ohm		
Digital velocity output	Triax connector		
Electrical S/P-DIF [4] Interface	24 bit, 48 kSa/s		
Frequency range	0 – 22 kHz		
Calibration accuracy	± 0.2 % (0.05 Hz – 22 kHz)		
Output filters			
Digital low pass filter (FIR type)	1 kHz, 5 kHz, 22 kHz (–0.1dB), roll-off 120 dB/dec		
Analog high pass filter	100 Hz (–3dB), roll-off 60 dB/dec		
PDV-100 Housing and Power			
Dimensions (mm)	300 (L) x 63 (W) x 129 (H)		
Weight (kg)	2.6		
Display	Illuminated 3 line LCD		
Protection rating	IP64 (dust and splashing water protected)		
Power requirements	11 V – 14.5 V DC, max 15 W		
PDV-BS Transportation bag and battery kit	2 Rechargeable Li-Ion batteries for nominal 5 hours operation time		
Compliance with Standards			
Electrical safety	EN 61010 (IEC 1010)		
EMC Emission	EN 50081-1 (FCC Class B)		
EMC Immunity	EN 50082-1, EN/IEC 61000-6-2		
Laser safety	EN/IEC 60825-1 (CFR 1040.10, 1040.11)		
CE	Mark (EMC, laser safety, LVD)		

[1] The resolution is defined as the signal amplitude (rms) at which the signal-to-noise ratio is 0 dB in a 10 Hz spectral bandwidth (RBW), measured from 3M Scotchlite® tape.

[2] The maximum stand-off distance depends on the surface properties of the object.

[3] Defined as spurious free dynamic range (SFDR).

[4] S/P-DIF: **S**ony/**P**hilips **D**igital Audio **I**nter**F**ace.

www.polytec.com

info-vi@polytec.de

POLYTEC GmbH
Polytec-Platz 1-7
76337 Waldbronn
GERMANY
Tel.: +49 (72 43) 6 04-0
Fax: +49 (72 43) 6 99 44
E-Mail: info-vi@polytec.de
http://www.polytec.de

Lambda Photometrics Ltd.
Lambda House, Batford Mill
Harpenden
Hertsfordshire AL5 5BZ
GREAT BRITAIN
Tel.: +44 (15 82) 76 43 34
Fax: +44 (15 82) 71 20 84
E-Mail:
info@lambdaphoto.co.uk
http://www.lambdaphoto.co.uk

Polytec PI, S.A.
32 rue Delizy
93694 PANTIN Cédex
FRANCE
Tel.: +33 (1) 48 10 39 30
Fax: +33 (1) 48 10 08 03
E-Mail: info@polytec-pi.fr
http://www.polytec-pi.fr

Polytec PI, Inc.
16 Albert Street
Auburn, MA 01 501
USA East/CANADA East
Tel.: +1 (508) 8 32 34 56
Fax: +1 (508) 8 32 05 06
E-Mail: info@polytecpi.com
http://www.polytecpi.com

Polytec PI, Inc.
1342 Bell Avenue, Suite 3 A
Tustin, CA 92780
USA West/Canada West/ Mexico
Tel.: +1 (714) 8 50 18 35
Fax: +1 (714) 8 50 18 31
E-Mail: info@polytecpi.com
http://www.polytecpi.com

PI-Polytec K.K.
Akebono-cho 2-38-5
Tachikawa-shi
Tokyo 190
JAPAN
Tel.: +81 (425) 26 73 00
Fax: +81 (425) 26 73 01
E-Mail: info@pi-polytec.co.jp