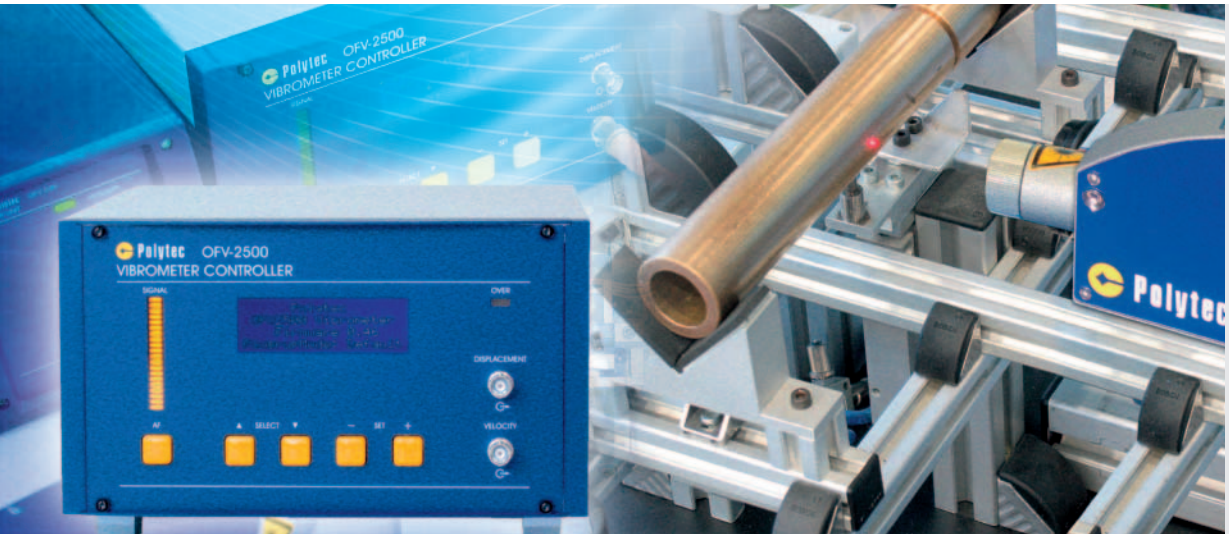
OFV-2500 Vibrometer Controllers



Polytec Industrial Vibrometers

- **OFV-2500 Series Vibrometer Controllers**
- OFV Series Sensor Heads
- CLV-2534 Compact Laser Vibrometer
- IVS-400 Industrial Vibration Sensor

Designed for commercial vibration measurements

The OFV-2500 Vibrometer Controllers are compact and flexible solutions for challenging vibration measurements in production environments, in component testing and in tasks that require high frequency bandwidth. They can be used with either single point or fiber-optic sensor heads including the OFV-534 Compact Sensor Head equipped with the integrated color video camera and microscope objective.

Task Specific Measurement Solutions

Polytec Laser Doppler Vibrometers are used to precisely measure mechanical vibrations quickly, easily and free from mass-loading or feedback problems. Utilizing the Doppler effect, these instruments measure the frequency shift of back-scattered laser light from a vibrating structure to determine its instantaneous velocity and displacement. Polytec has designed a full series of specialized vibrometer controllers for challenging vibration measurements in production environments, in component testing and in tasks that require high frequency bandwidth. Two new models expand the bandwidth to 3.2 MHz and offer digital demodulation for velocity signals. Featuring a velocity limit of up to 10 m/s and an acceleration limit of up to 15 million g, the OFV-2500 becomes an excellent alternative to the flagship OFV-5000 controller when cost or compact size is more important than measurement flexibility.

With the next generation of Dual Channel Controllers for simultaneous measurement at 2 points and the OFV-2570 Ultrasonic Controller featuring 24 MHz bandwidth (see separate data sheet), Polytec broadens the selection of vibration test and measurement instruments to ensure that you can get the optimum out of your application and your budget.

Key Features and Benefits

- Simple, affordable, task specific measurement solution
- Effortless operation through user-friendly front panel display or remote control interface
- Compatible with all OFV Sensor Heads (single point and differential)
- Single or dual channel controller configurations

Technical Data

OFV-2500-2 Performance Specifications						
Velocity Decoder						
Range	Full scale (peak)	Lower frequency limit	Upper frequency limit	Resolution (typical) [1]	Acceleration	Linearity error
mm s^{-1}/V	m/s	Hz	kHz	µm $s^{-1}/\sqrt{Hz}$	g	± %
10	0.1	0.5	250	0.2	16,000	1
100	1.0	0.5	3,000	0.5	1,900,000	1
1,000	10(7) [2]	0.5	3,200	2.5	15,300,000	1
Displacement Decoder (Integrator Option)						
µm/V	µm	Hz	kHz	nm	g	± %
0.01	0.1	1,000	250	depends on velocity range setting	depends on velocity range setting	2.5
0.1	1	1,000	250			2.5
1	10	1,000	250			2.5
10	100	100	250			2.5
100	1,000	10	20			2.5
1,000	10,000	10	20			2.5
10,000	100,000	10	20			2.5

OFV-2500-3 Performance Specifications						
Velocity Decoder						
Range	Full scale (peak)	Lower frequency limit	Upper frequency limit	Resolution (typical) [1]	Max. acceleration	Linearity error
mm s^{-1}/V	mm/s	Hz	kHz	µm $s^{-1}/\sqrt{Hz}$	g	± %
2	20.0	0	100	0.02	1,280	<0.1
5	50.0	0	100	0.02	3,200	<0.1
10	100	0	350	0.05	22,000	<0.1
20	200	0	350	0.06	44,000	<0.1
50	500	0	350	0.06	110,000	<0.1

OFV-2520 Performance Specifications						
Velocity Decoder (Dual Channel)						
Range	Full scale (peak)	Lower frequency limit	Upper frequency limit	Resolution (typical) [1]	Max. acceleration	Linearity error
mm s^{-1}/V	m/s	Hz	kHz	µm $s^{-1}/\sqrt{Hz}$	g	± %
5	0.05	0.5	250	0.2	8,000	1
100	1	0.5	3,000	0.5	1,900,000	1
1,000	10(7) [2]	0.5	3,200	2.5	15,300,000	1

[1] The noise-limited resolution is defined as the signal amplitude (rms) at which the signal-to-noise ratio is 0 dB with 1 Hz spectral resolution, measured on 3M Scotchlite Tape® (reflective film). The typical value refers to the center of the operating frequency range.

[2] 10 m/s @ 300 kHz; 7m/s @ 3,200 kHz

The OFV-2500 Vibrometer Controller Family

OFV-2500-2 Large-Bandwidth Vibrometer Controller

The OFV-2500-2 Controller features vibration velocity demodulation up to 10 m/s in a frequency range up to 3.2 MHz. Using an optional analog integrator module, a displacement signal up to 250 kHz can be computed from the velocity signal.

OFV-2500-3 Digital Vibrometer Controller

This model features digital vibration velocity demodulation, at a frequency range up to 350 kHz. An excellent S/N ratio and high resolution and linearity are the key benefits of digital demodulation.

OFV-2510 Displacement Controller

The OFV-2510 Controller features displacement demodulation based on fringe counting for industrial test and inspection setups that require measurement of pulse-shaped translations or vibration amplitudes in a frequency range up to 250 kHz.

OFV-2520 Dual Channel Controller

Special controller with velocity demodulation to connect and simultaneously operate 2 sensor heads, frequency range up to 3.2 MHz.

OFV-2500 Vibrometer Controller

OFV-2510 Displacement Controller

OFV-2520 Dual Channel Controller

Industrial and Laboratory Applications

Increasing Challenges

Today's products tend to become smaller, more complex and incorporate more subsystems. Inspection of these small structures is a significant challenge to test engineers managing the quality and controlling the manufacturing process.

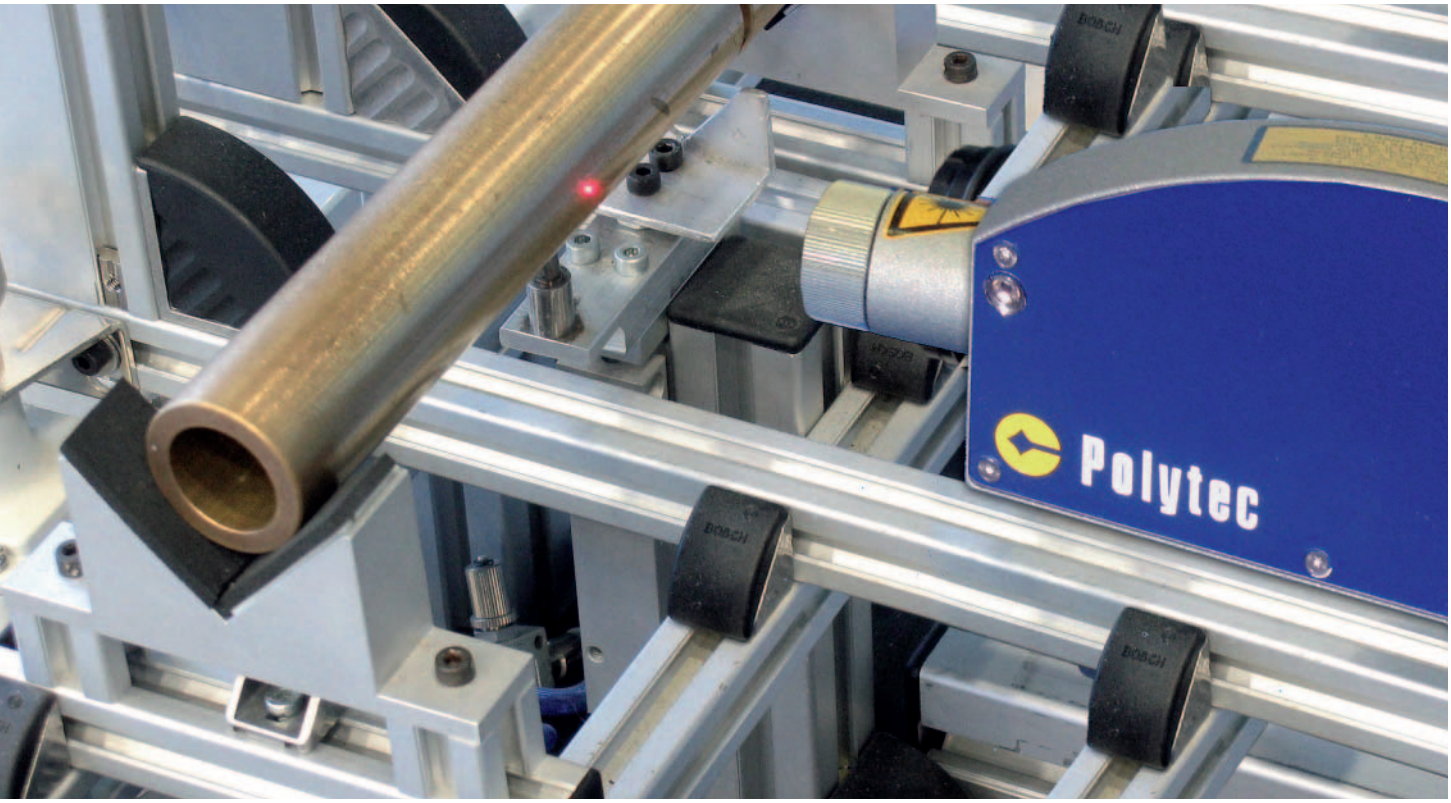
Solutions for Vibration Measurement

The OFV-2500 Vibrometer Controllers, together with one of Polytec's compact and rugged interferometric sensor heads, can cope with the special conditions of an industrial environment. Easy integration with the process controller, non-contact measurement, flexible stand-off distance and static fixturing are features that suggest low maintenance requirements, as no wear and tear on mechanical components is involved.

Automotive, Data Storage and other Industries

Polytec Vibrometers are widely used by NVH engineers for vibration measurements on automotive parts and by major manufacturers of electrical parts and components for non-contact, in-line production testing enabling 100 % quality control.

For complete up-to-date information please visit our website:
www.polytec.com/vibrometers
or contact your local Polytec sales/application engineer.



Be Part of the System – The OFV Series

The OFV-2500 Vibrometer Controller series is designed to work with the OFV collection of components and accessories, making it a versatile addition to the family of products. To match your requirements, your specific Vibrometer solution benefits from the wide range of Polytec's off-the-shelf sensor heads. The choice spreads from the compact OFV-534 sensor head with integrated video camera and optional microscope optics to the OFV-505 featuring auto-focus and highest optical sensitivity. A wide range of accessories, positioning tools and automated positioning systems allow operation in both industrial and R&D environments.

The OFV-2500 Controllers feature a straightforward BNC voltage output which can be input into almost any signal processing system or process controller. Polytec offers data acquisition systems using Polytec's VibSoft acquisition software that is specifically matched to all Polytec Vibrometers including the highest bandwidth models. For PASS/FAIL evaluation in automated in-line quality control processes, Polytec offers the QuickCheck package which is specially developed for acoustic quality checks. QuickCheck acquires and evaluates measurement data and interacts with the production line control.

Typical applications

- In-line testing of fuel injection systems
- Acoustic quality control of electric motors
- Critical resonance testing on data storage components such as disk drive suspensions and bearings
- Microstructure research and testing
- Aerospace component testing
- Ultrasonic tools and actuators
- Medical applications

The OFV System at a Glance

OFV-2500 Series Vibrometer Controllers

- **OFV-2500-2** Large-Bandwidth Velocity Vibrometer Controller
  - **OFV-2500-I** Displacement Integrator
- **OFV-2500-3** Digital Velocity Vibrometer Controller
- **OFV-2520** Dual Channel Velocity Vibrometer Controller
- **OFV-2570** High Frequency Velocity and Displacement Vibrometer Controller
- **OFV-2510** Displacement Controller

VibSoft Data Acquisition

- **VibSoft-80/-84**
  2 to 4-channel data acquisition up to 80 kHz
- **VibSoft-1000/-1004**
  2 to 4-channel data acquisition up to 1 MHz
- **VibSoft-M2-40**
  2-channel data acquisition up to 40 MHz

VibSoft Options

- **VIB-S-VIDEO**
  VibSoft Video for
  VIB-A-CAM
  VIB-A-CAP
  Test stands
- **PC-I**
  Integration of VibSoft in high-end Industrial PC
- **PC-D**
  Integration of VibSoft in high-end Desktop PC

OFV Series Vibrometer Sensor Heads

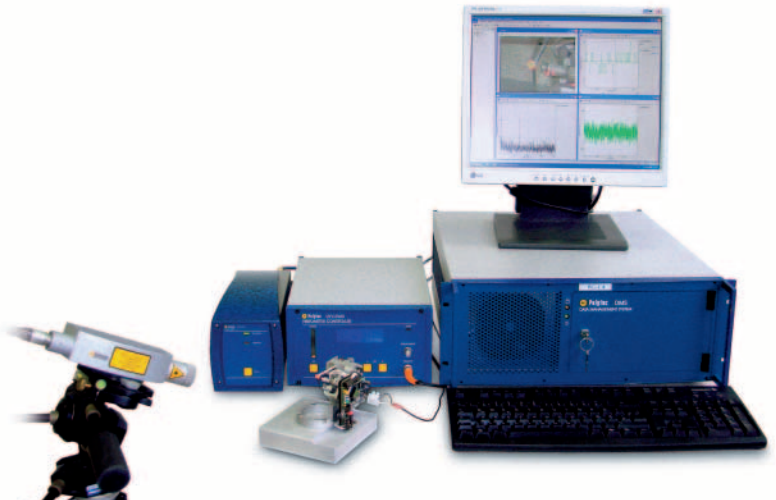
- **OFV-505 Sensor Head**
  featuring auto focus
- **OFV-503 Sensor Head**
  featuring manual focus control and lock
- **OFV-534 Compact Sensor Head**
  with external laser unit
- **OFV-551 Fiber Optic Interferometer**
- **OFV-552 Differential Fiber Optic Interferometer**

Sensor Head Accessories

- **OFV-50X Accessories**
  - Lens system
  - Side exit probes
  - Cable extensions
- **OFV-534 Accessories**
  - Integrated video camera
  - Telescopic objective
  - Sample illumination
  - Microscope objectives
  - Side exit probes
  - Test stands
  - X, Y, Z Traversing systems
- **OFV-55X Accessories**
  - Micro spot adapters
  - Side exit probes
  - Test stands with video

Positioning Equipment

- **VIB-A-P01** Tilt Stage
- **VIB-A-P02** Traverse/Tilt Stage
- **VIB-A-P05** Tip/Tilt Stage
- **VIB-A-P06** Traverse/Tilt Stage
- **VIB-A-P07** Mounting Plate (tilt/rotation)
- **VIB-A-T04** Tripod (standard head)
- **VIB-A-T05** Tripod (geared head)



Technical Data

OFV-2510 Performance Specifications						
Displacement Decoder						
Range	Full scale [1] (peak to peak)	Lower amplitude limit	Upper frequency limit [2]	Resolution (typical) [3]	Max. acceleration	Linearity error [4]
µm/V	µm	µm	Hz	µm/count	g	± %
80	1,280	0.4	800	0.08	14,500	1
160	2,560	0.8	400	0.16	14,500	1
320	5,120	1.5	200	0.32	14,500	1
640	10,240	3.0	100	0.64	14,500	1
1,280	20,480	6.0	50	1.28	14,500	1
2,560	40,960	12.0	25	2.56	14,500	1
5,120	81,920	25.0	12	5.12	14,500	1

[1] Full scale values correspond to ±8 V maximum output voltage.

[2] Maximum frequency at 50 % of full output amplitude. The decoder frequency limit which is valid for vibration amplitudes up to 1 µm is 250 kHz.

[3] The resolution is defined as 1 increment of the fringe counter output, which corresponds to an output voltage step of 1 mV.

[4] ±1 increment

General Specifications			
Controller type	**OFV-2500**	**OFV-2510**	**OFV-2520**
Dimensions (L x W x H)	235 x 320 x 150 mm (19", 1/2 rack config.)	235 x 320 x 150 mm (19", 1/2 rack config.)	450 x 360 x 150 mm (19", full rack config.)
Analog signal outputs	■ Velocity ■ Displacement (integrator option) ■ Signal strength (0 ... +5 V)	■ Displacement ■ Signal strength (0 … +5 V)	■ Velocity A/B ■ Signal strength A/B (DC 0 … +5 V)
Digital interfaces	■ RS-232	■ RS-232 ■ TTL interface to external fringe counter ■ TTL tigger input	■ USB 1.1 interface to control the vibrometer
Weight	5.6 kg (12.3 lbs)	5.5 kg (12.1 lbs)	9 kg (19.8 lbs)
Power	100 VAC ... 240 VAC ±10 %, 50/60 Hz, max. 75 W		
Ambient temperature	+5 °C … +40 °C (41 °F … 104 °F)		
Storage temperature	–10 °C … +65 °C (14 °F … 149 °F)		
Relative humidity	max. 80 %, non-condensing		
Compatibility	OFV-505/503, OFV-551/552, OFV-534 Sensor Heads [1]		

[1] When operating the OFV-534 Sensor Head with the OFV-2510 Controller, the signal level display on the sensor head is not available.

Compliance with Standards	
Laser safety	IEC/EN 60825-1 (CFR 1040.10, CFR 1040.11)
Electrical safety	IEC/EN 61010
EMC	IEC/EN 61326

For more information, please visit our website **www.polytec.com/vibrometers** or contact your local Polytec sales/application engineer.

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