

VD/DD Decoder Guideline



Modular Vibrometer System

- OFV-5000
Vibrometer Controller
 - Velocity Decoders
 - Displacement Decoders
- OFV-505/503
Standard Sensor Heads
- OFV-534
Compact Sensor Head
- OFV-551/552
Fiber Interferometers

Decoder Selection & Combination

By selecting from a choice of different analog and digital decoders, performance of the OFV-5000 Vibrometer Controller can be precisely tailored to match the demands of the application. Up to four decoders can be installed simultaneously to obtain the greatest possible flexibility. This flexibility also allows subsequent add-ons and modifications to meet future needs.

Decoder Selection

The OFV-5000 controller is designed to accept a choice of signal processing modules, each optimized for different frequency, velocity or displacement performance.

Various analog and/or digital decoder options seamlessly cover the entire velocity range up to ± 10 m/s, displacements from picometers to meters, and frequencies from DC to 24 MHz.

The following table lists the basic features of the velocity decoders available for the OFV-5000. Displacement decoders and recommended decoder combinations are described on the reverse side. For more information please see separate data sheets for the respective decoders and the OFV-5000 vibrometer controller.

Decoder	Description	No. of Ranges	Best Resolution	Max. Velocity	Upper Freq. Limit
VD-02	Wide-bandwidth velocity decoder	4	0.15 $\mu\text{m/s}$	10 m/s	1.5 MHz
VD-04	Mid-frequency velocity decoder (prerequisite to DD-400)	3	0.20 $\mu\text{m/s}$	10 m/s	250 kHz
VD-05	10 MHz velocity decoder for ultrasonics	2	< 3 $\mu\text{m/s}$	2.5 m/s	10 MHz
VD-06	Digital high-precision velocity decoder	4	0.01 $\mu\text{m/s}$	0.5 m/s	350 kHz
VD-09	2.5 MHz Digital velocity decoder	14	0.02 $\mu\text{m/s}$	10 m/s	2.5 MHz

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Data Sheet
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Available Displacement Decoders

Decoder	Description	No. of Ranges	Best Resolution	Full Scale Output	Frequency Range
DD-100	Basic displacement decoder (requires any velocity decoder)	8	80 nm	± 82 mm	0 Hz – 250 kHz
DD-200	High-resolution displacement decoder (requires any velocity decoder)	13	2 nm	± 82 mm	0 Hz – 250 kHz
DD-300	24 MHz displacement decoder for ultrasonics (requires any velocity decoder)	1	0.1 pm	± 75 nm	30 kHz – 24 MHz
DD-400	Integrating displacement decoder (requires VD-04)	3	*	± 1 mm	20 Hz – 250 kHz
DD-500	Digital high-end displacement decoder (requires VD-06)	16	15 pm	± 50 mm	0 Hz – 350 kHz
DD-900	Digital displacement decoder	16	15 pm	± 50 mm	0 Hz – 2.5 MHz
DD-600	I&Q converter for data processing with VibSoft VDD				

* Frequency dependent

Decoder Selection

The OFV-5000 controller has four internal slots to accept up to four different signal decoders, depending on the desired measurement ranges. Two are specifically designated for velocity decoders and one is for the displacement decoder. An Auxiliary Slot is provided that can take either an optional velocity or displacement decoder.

The following table contains recommended decoder combinations for representative applications. More combinations adding further decoders are possible. If you have specific requirements, please contact Polytec's application and sales engineers who will help you select the appropriate decoders and VibSoft software.

Recommended Decoder Combinations		
VD-02	DD-200	Measurement of velocity and displacement up to 1.5 MHz and 10 m/s velocity. General applications, e.g. acoustics, mechanical and automotive engineering
VD-06	DD-500	Digital, high-precision measurement of velocity and displacement at frequencies up to 350 kHz with velocity range limited to 0.5 m/s. Demanding applications e.g. acoustics, micro systems, precision mechanics
VD-02 + VD-06	DD-500	Same as VD-06/DD-500, but additional analog measurements in a vibration frequency range extended up to 1.5 MHz and velocity range extended up to 10 m/s
VD-02 + VD-05		Measurement of velocity at high frequencies up to 10 MHz. High-frequency applications, e.g. ultrasonics, micro systems
VD-02	DD-300	Acquisition of vibrations at frequencies up to 24 MHz. High-frequency applications, e.g. ultrasonics, micro systems
VD-04	DD-400	Special solution for measurement of small displacements at very high velocities. Applications: monofrequent ultrasonic tools and processing, e.g. wirebonding, ultrasonic welding
VD-09		Acquisition of vibrations at frequencies from DC up to 2.5 MHz at high resolution and velocity. Application: ultrasonics and microstructures
VD-09	DD-900	Additional direct displacement output with picometer resolution. Suitable for measurement signals with DC components like switches or transient behaviour

For more information on signal decoders please see OFV-5000 Vibrometer Controller data sheet and the respective decoder data sheets, or contact your local sales/application engineer. The data sheets can be downloaded from www.polytec.com/vibrometers or can be requested at your local Polytec Office.

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