

## MPV-800 Multipoint Vibrometer

The laser-based MPV-800 Multipoint Vibrometer enables synchronous measurement with multiple channels and reconstructs operational deflection shapes resolved in time and frequency.

The user-configurable array of fiber coupled sensors allows flexible measurements either in a single direction or around a complex shaped object. It can even provide 3D vibration vector information.

Highly dynamic events are captured from any possible angle by individually positioning up to 48 individual fiber heads.



### Highlights

- Capture transient and non-stationary events in a single synchronous measurement
- Flexible and user-configurable up to 48 optical channels
- Time and frequency resolved deflection shapes in 3D
- Non-contact vibration sensing
- Best optical sensitivity avoids surface preparation
- Eye-safe laser

# MPV-800 Multipoint Vibrometer

## Synchronous optical vibrometry

### Datasheet



# Technical data

The rack-mounted MPV-800 basic system with standard eight optical channels can be extended with additional modules to a vibrometer system with 48 optical channels in total.

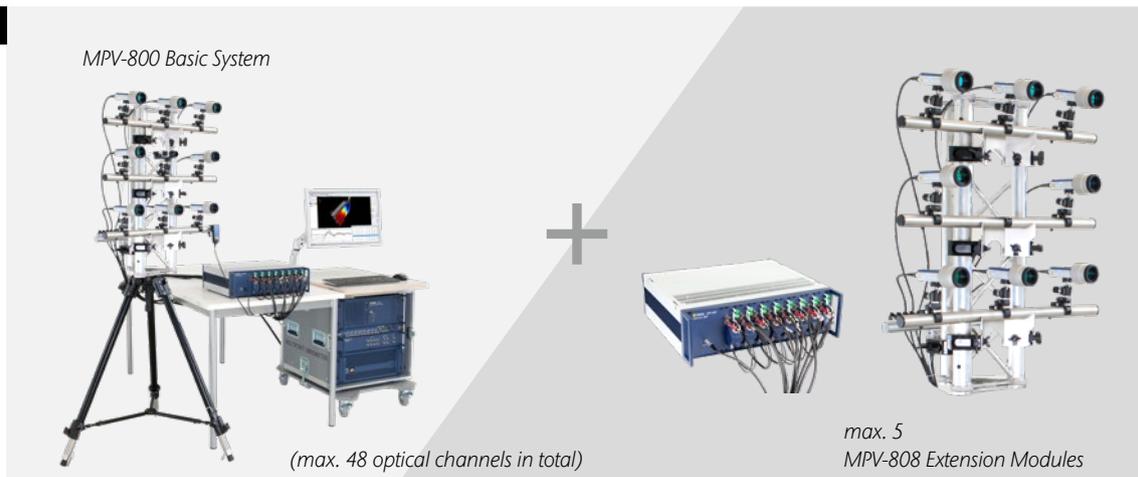


## MPV-800 Basic System

Data acquisition system	MPV-W-800 Data Management System, MPV-A-840 System Cabinet incl. Monitor, MPV-D-800 Junction Box, MPV-E-800 Data Acquisition Unit for 8 optical channels and 8 reference channels
Optical unit and fiber heads	MPV-I-800 Optical Unit 8 channels, MPV-C-Ixx Main Cable Set Optics to DAQ 10 m (30 m), MPV-O-810 Fiber Heads version 3 m (5 m)
Accessories	MPV-A-850 Camera, MPV-A-830 Signal Level Display, MPV-A-T20 Stand for Fiber Heads, VIB-A-T20 Heavy Duty Tripod

## MPV-808 Extension Module

Data acquisition system	MPV-D-808 Extension for Data Acquisition
Optical unit and fiber heads <sup>1</sup>	MPV-I-800 Optical Unit 8 channels, MPV-C-I10 Main Cable Set Optics to DAQ 10 m (30 m)



Visible and Invisible Laser Radiation  
 Class 1 Laser Product  
 According to IEC/EN 60825-1 (2014)  
 $P < 390 \mu\text{W}/\text{cm}^2$ ;  $\lambda = 660 \text{ nm}$   
 $P < 10 \text{ mW}/\text{cm}^2$ ;  $\lambda = 1550 \text{ nm}$   
 Complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed. 3, as described in Laser Notice No. 56, dated May 8, 2019.

**Metrological specifications**

# of optical channels	8, 16, 24, 32, 40 or 48 max.
Max. velocity	± 1.75 m/s
# of reference channels	8, ± 10 V, IEPE supply <sup>2</sup>
Frequency bandwidth	0 Hz – 50 kHz, 100 kHz <sup>2</sup>
Trigger input	TTL IN or analog on reference or vibrometer channel
Signal generator <sup>2</sup>	4 channel, uncorrelated, ± 3V

Decoder	# of ranges	Full scale m/s (peak)	Decoder bandwidth kHz	Resolution <sup>3</sup> (µm/s) / √Hz	# of reference channels	# of signal generator channels <sup>2</sup>
MPV Software Decoder (GPU processing)	12	0.001 .. 1.75	0 .. 50 (100) <sup>2</sup>	0.03 .. 0.55	8	4

**Optical specifications**

Laser type, vibrometer	1,550 nm
Laser type, pilot laser	660 nm ± 7 nm, visible red
Laser output power per channel	< 3.3 mW (< 390 µW for pilot laser)
Laser safety class	Class 1

**Fiber Head MPV-O-810 MR (MidRange)**

Optical cable length	3 m (5 m)
Stand-off distance	0.5 m – 5 m
Focus	Manual focus
Minimum spot size	160 µm @ 500 mm stand-off distance
Signal level indicator	2 LED signal level indicators

**Camera MPV-A-850**

Resolution	1920 x 1080 HD resolution
Lens	Zoom lens, 3.3 - 12 mm, W 65° - T 23°, manual focus
Interface	GigE, Ethernet, 15 m (50 m) <sup>2</sup> cable length
Power Supply	Power supply PoE (via Ethernet Cable)

<sup>1</sup> Fiber heads can be chosen from accessories.

<sup>2</sup> Optional

<sup>3</sup> 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 in a distance of 1 m on 3M Scotchlite™ tape (retro-reflective film). The attainable resolution is frequency-dependent and is specified for frequencies above 10 Hz.



## General specifications

	<b>Data acquisition system in mobile system cabinet</b>	<b>MPV-I-800 Optical Unit</b>	<b>MPV-O-810 MR Fiber Head</b>
Dimensions [W x H x D]	580 x 1,035 x 845 mm	450 x 140 x 460 mm (19", 84 TE/3 HE)	Ø 60 mm x 166 mm
Weight	118 kg	11 kg	0.75 kg
Protection class	IP20 (DIN EN 60529)	IP20 (DIN EN 60529)	IP64 (DIN EN 60529)
Operating temperature	+5 °C ... +40 °C (41 °F ... 104 °F)	+5 °C ... +50 °C (41 °F ... 122 °F)	+5 °C...+75 °C (41 °F...167 °F)
Storage temperature	-10 °C ... +65 °C (14 °F ... 149 °F)	-10 °C...+65 °C (14 °F ... 149 °F)	-10 °C...+75 °C (14 °F...167 °F)
Relative humidity	max. 80%, non-condensing	80% up to 35°C , 30% at 50°C, non-condensing	max. 80%, non-condensing
Power supply	100...240 VAC ±10%, 50/60 Hz	100...240 VAC ±10%, 50/60 Hz	powered by Optical Unit
Power consumption	typ. 450 VA, max. 1,450 VA	max. 150 VA	n.a.

## Options and accessories

	<b>MPV-800 Basic System</b>	<b>MPV-808 Extension Module</b>
MPV-O-810 Fiber Head MR 3 m (5 m)	S	O
MPV-C-I10 Main Cable, interconnecting cable 10 m between MPV-I-800 Optical Unit and MPV-E-800 Junction Box	S	S
MPV-C-I30 Main Cable, interconnecting cable 30 m between MPV-I-800 Optical Unit and MPV-E-800 Junction Box	O	O
MPV-A-830 Signal level display, for convenient focus optimization	S	O
MPV-D-850 Signal Generator incl. software support	O	–
MPV-E-860 IEPE (ICP®) power supply with integrated amplifier for 8 reference channels	O	–
MPV-A-T20 Stand for Fiber Heads	S	O
VIB-A-T20 Heavy Duty Tripod for MPV-A-T20	S	O
MPV-A-T20-B Base Plate for Stand, compatible to MPV-A-T20, for table top and low measurement height	O	O
MPV-A-860 Storage System for MPV-O-810 Fiber Heads, for save storage of 8 Fiber Heads, can be stacked and fixed on MPV-I-800 Optical Unit, includes MPV-A-880 Protective Cover	O	O
MPV-A-880 Protective Cover for Optical Unit Front cover to protect the optical fibers in harsh environments	O	O
A-FOP-0001 Fiber Optics Inspection Microscope	S	O
A-FOP-0003 Cleaning Device for Fiber Socket	S	O
A-FOP-0004 Cleaning Device for Fiber Connector	S	O

S: Standard;  
O: Option;  
–: Not available

MPV-800 is designed as a modular system to be used in development labs and test fields. A range of hardware accessories allows to tailor the measurement system to the specific test setup or to simply make storage and handling easier.



*MPV-800 Basic System with 8 optical channels*



*MPV-A-T20 Stand on MPV-A-T20-B Base Plate for low measurement height*



*MPV-A-860 Storage System for MPV-O-810 Fiber Heads*



*MPV-A-830 Signal level display, for convenient focus optimization*

# Software features

This integrated software provides controls for setup, data acquisition and data analysis for up to 56 channels. Working with object geometries by imports from CAD or FE allows for calculating the surface normal vectors and transformation of data to these vectors, or transformation of data from 3D measurement points into the object coordinate system. This offers a direct comparison with simulation data or with acoustic simulations.

The following features are provided:



Measurement setup	<ul style="list-style-type: none"><li>■ Geometry setup for up to 48 optical channels and 8 reference channels in 3D coordinates</li><li>■ Euler angles</li><li>■ Live video with geometry overlay and matching</li><li>■ Import of measurement geometries</li></ul>
Data acquisition	<ul style="list-style-type: none"><li>■ Various internal and external trigger functions</li><li>■ Various averaging functions incl. peak hold</li><li>■ Optional signal generator control</li><li>■ Digital filters; real time integration and differentiation</li></ul>
Analysis	<ul style="list-style-type: none"><li>■ Display and analysis of spectra and time traces</li><li>■ Display of magnitude, phase, real- and imaginary part</li><li>■ Calculation of FRF, H1, H2, AP, CP, ESD, PSD and coherence</li><li>■ ODS animation in pseudo colors in time domain and frequency domain</li><li>■ Animated profile cuts</li><li>■ Various export filters for data, animation and graphics</li><li>■ Scripting and optional post processing</li></ul>

# Software options

Model	MPV-800 Multipoint Vibrometer	
<b>Preparation</b>		
APS professional	For arbitrary definition of measurement points and individual object properties	S
Geometry data import	Geometry module for importing geometry data to the MPV software for defining the scan points	S
3D data acquisition	Module for data acquisition with combined 3D fiber heads; requires 3 optical units (24 channels); includes module for coordinate transformation in (imported) object coordinate systems	S
Camera alignment	Automated matching of 3D geometries with live video image	S
<b>Measurement</b>		
Time domain animation	Animation of operational deflection shapes in time domain, Allows for “slow motion” animation e.g. of surface waves propagation or switches	S
Extended FFT lines	Option to extend the number of FFT lines up to 204,000	O
Multi frame	For triggered measurements on combustion engines and brakes	O
Bandwidth extension	Extends the acquisition bandwidth to 100 kHz	O
<b>Analysis &amp; interfaces</b>		
SignalProcessor	The user interface to the math library included in the MPV software, designed as an easy-to-use spreadsheet	O
UFF interface	Universal file format data conversion from and to major modal analysis and finite element packages	S
ME’scope modal software	Software package for modal analysis. Including data interface	O
Data export to ME’scope	Data export to Vibrant’s ME’scope modal analysis software	O
ASAM ODS	Import and export of data in ASAM ODS 5.3.0 ATRX	O
<b>Automation and programming interface</b>		
Macro programming	WinWrap® Basic Engine: Visual Basic® for Applications (VBA) compatible; allows automation of test routines	S
Polytec file access	API for retrieval of Polytec data via external applications supporting Component Object Model (COM), e.g. Visual Basic .NET®, C#, MATLAB®, LabVIEW™	S
<b>Maintenance package</b>		
Software maintenance basic	Free MPV Software updates for a period of 2 years	S
Extended software maintenance	Entitles for software updates for an additional period; available in 12 month increments	O
University program	Lifetime update license for universities and education (terms and conditions apply)	O
Desktop analysis version	Desktop version of MPV Software for offline post processing and presentation	O



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O: Option;  
–: Not available



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