



VibroMatrix® Kit

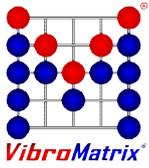
Measuring Microvibrations



The VibroMatrix kit for microvibrations contains all components needed for displaying and recording the slightest vibrations.

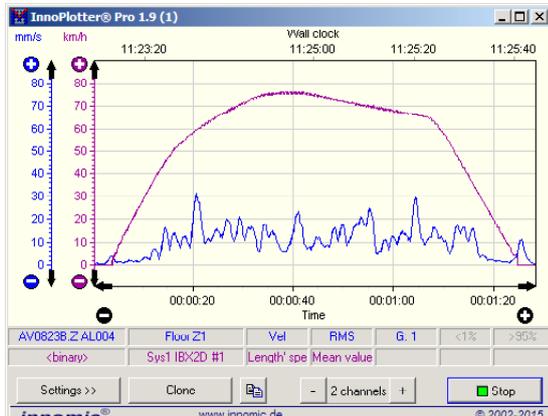
- The high-quality 24-bit digitization of the vibration signal in HD quality is taken by the data converter InnoBeamer LX2.
- The software instruments InnoPlotter Pro and InnoAnalyzer Pro are included for evaluation. They can be adapted to the most diverse parameters of the manufacturers because of their wide setting options and perform long-term-monitoring in time and frequency area.
- By means of limit value curves the instruments can automatically produce graphics of exceedances in order to ensure an unobserved measurement.
- Parallel to measurement / monitoring, a raw data logging can be switched on, additionally. This logged the sensor signals in an untreated condition and with full information content to the hard disk.
- Using the included InnoMaster Replay, these datas can be imported in the instruments. The full information content of the raw signal allows it to configure the instruments completely other than during the measurement time. Nevertheless, the results are exactly the way displayed as if this configuration has existed already at the measurement time.

	VMSet-25-1	VMSet-25-3
Hardware		
Sensor for Vibration Measurement	Piezoelectric accelerometer - Sensitivity: 10000 mV/g, linear frequency range: 0.08 .. 260 Hz - Operating temperature: -20 .. 80 °C - Accessories: 5m cable	
Amount	1x	3x
USB box for Digitization	InnoBeamer LX2 - Inputs: 2x analog for vibration sensor(s), 1x digital for photoelectric reflex switch - Signal frequency: 0.1 .. 3200 Hz - Supply current: < 500 mA with supply of all sensors - no mains adapter required - Operating temperature: -20 .. 50 °C, weight: 350 gr. - Accessories: Synchronisation cable and 1m USB cable	
Amount	1x	2x
Software Licenses		
InnoPlotter Pro	1x	3x
InnoAnalyzer Octave Pro	1x	3x

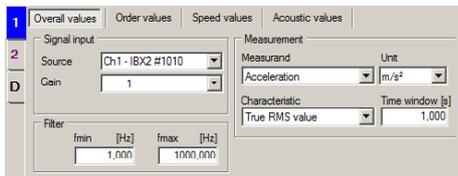


InnoPlotter® 1.9

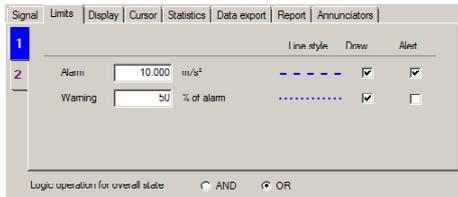
Digital Strip Chart Recorder



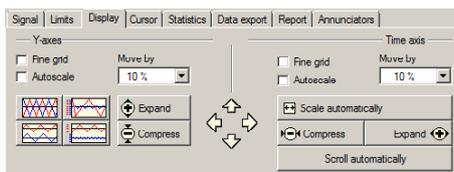
Simultaneous display up to 4 graphs, different measurands



Numerous settings for signal conditioning



Warning/alarm limit for monitoring characteristics

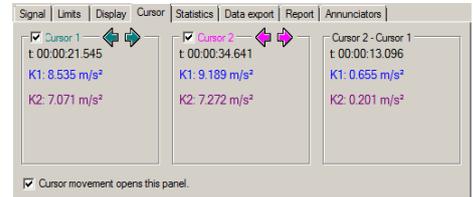


Arrange, zoom, compress graphs individually

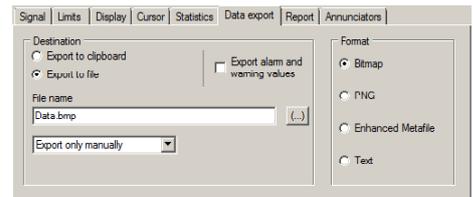
Application

Vibrations are caused by rotating parts or impulse-like loads, e.g. by a vibratory pile driver in the construction-field. In numerous vibration standards significant vibration characteristics and limit values are defined for a reliable evaluation of the vibration situation.

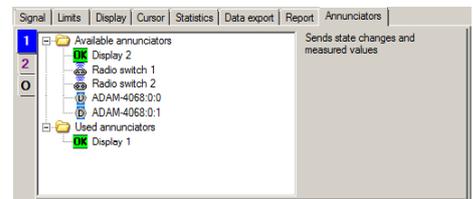
The InnoPlotters measure these vibration characteristics, display their trend graphically and monitor them when required. Thus, they are especially convenient for longer test sequences. Weak spots in the continuous operation become obvious, the success of counter measures is proven and the compliance with limits is controlled.



2 cursors, display of cursor data and difference



Data export by mouse click or automated



Annunciation of measured data and events

Properties

The InnoPlotter is a universal digital strip chart recorder for up to four characteristics. It features a memory for 24 hours continuous recording and various display modes. 2 time axes are available for the absolute time and the elapsed time since the start of measuring.

The Pro version is able not only to integrate vibration acceleration to vibration velocity and displacement, but also to measure rotation speed and user measurands. Optional monitoring of characteristics is offered as well.

The following settings are available for signal conditioning:

- Free filter adjustment 0.1 .. 40000 Hz
- SI and imperial units for each measurand
- 25 characteristics

2 cursors allow the exact measurement of the data. Measurement graphs can be moved and spread manually or be arranged automatically. Time bar can be moved depending on the progress of the measurement.

The export of data into other applications as graphic or text is possible without any problems. Saving measured data can be carried out manually or triggered. By means of annunciator function, the InnoPlotter can forward measured data or events automatically, e.g. by e-mail.



Technical Data

	InnoPlotter Pro	InnoPlotter
Signal Processing		
Filter	Freely adjustable 0.1..40 000 Hz **	
Time Window	Freely adjustable 0.1..10 s	
Measurands	Alternating measurands: Vibration acceleration, velocity, displacement; force, pressure, sound pressure, voltage, user-defined measurands	
	Rotation speed, phase angle, noise weighted	
Integrated Measurands	Acceleration → Velocity and displacement	
Units	m/s ² , mm/s ² , μm/s ² , nm/s ² , pm/s ² , g, mg, μg, km/s ² , kg, dB m/s, mm/s, μm/s, nm/s, pm/s, in/s, mil/s, μin/s, dB m, mm, μm, nm, pm, ft, in, mil, μin, dB kN, N, mN, μN, nN, lb, oz bar, mbar, MPa, kPa, hPa, Pa, mPa, μPa, nPa, psi V, mV, μV, nV, pV A, mA, μA, nA, pA	
	1/min, 1/s, Hz, 1/h Hz, kHz % °	
Characteristics	Overall values: Instantaneous value, peak value absolute / positive / negative, peak-to-peak value, true r.m.s. value, main frequency, harmonic distortion, crest factor Order values: Peak value, r.m.s. value, phase angle Speed values: Mean value, instantaneous value Acoustic values: Noise level with A- and C-weighted frequency (peak / fast / slow time weighted, equivalent continuous noise); noise level unweighted (fast / slow time weighted); daily noise exposure level	Overall values: Instantaneous value, peak value absolute / positive / negative, peak-to-peak value, true r.m.s. value
Monitoring	Free alarm limit, warning limit 0..100% of alarm limit	
Statistics	Mean value, minimum, maximum	
Graphical Presentation		
Number of Measurement / Limit Graphs	1 .. 4 per window / 0 .. 8 per window	
Interval Y-axis / t-axis	0.01 .. 10000 / 6 s .. 24 h	
Digital Channel	Display of the variation in time of the trigger status (switchable, one measuring channel)	
Refresh	1 / 8 / 16 times per second *	
Status Indicators	Sensor, measuring channel, measurand, characteristic, gain, underload, overload	
Cursors	2 lines, freely adjustable by mouse or button, display of cursor values and difference	
Data Export		
Control	Manually, time-triggered, level-triggered	Manually, time-triggered
Formats / Destinations	Bitmap, PNG, Enhanced Meta File (EMF), text / Clipboard, file	
Event Annunciators		
Display	Single channel: Currently measured value Single channel: Current alarm state Instrument: Current alarm state	Single channel: Currently measured value
Radio Switch	Single channel: Current alarm state Instrument: Current alarm state	-
Digital Output	Single channel: Current alarm state Instrument: Current alarm state	-
E-Mail	Time-triggered transfer of measurement data Level-triggered transfer of measurement data	Time-triggered transfer of measurement data
Miscellaneous		
Available in a Kit	VMSset;-03;-04;-05; VMSset-25	
General Functions	Measurement data is held after switching off, module is cloneable	

* Centrally managed in the InnoMaster

** 0.1 .. 3200 Hz when working with the InnoBeamer LX2

Changes without prior notice

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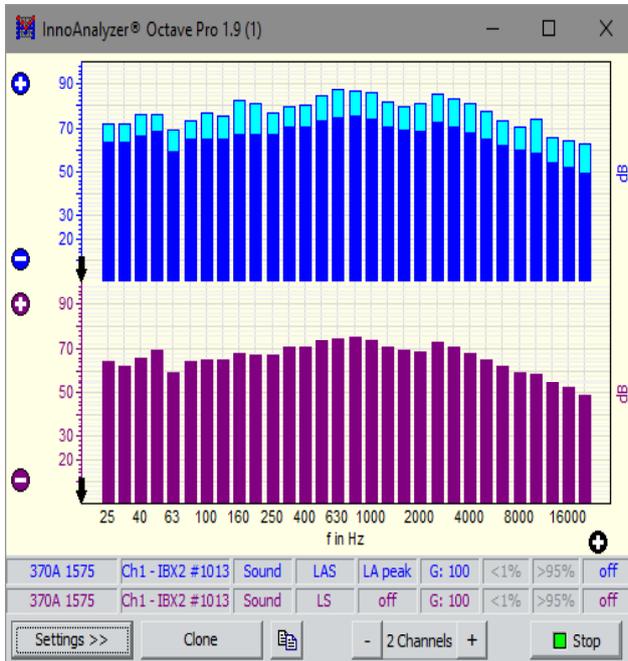
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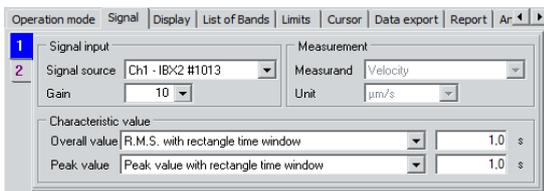


InnoAnalyzer Octave 1.9

Octave band analyser



Acoustic mode with switchable peak value display.

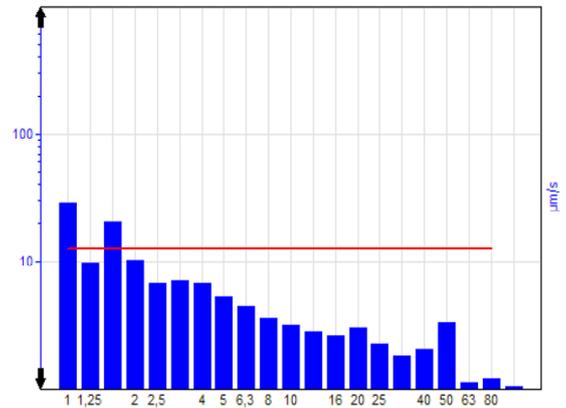


The measured variables are already preset in accordance with VDI 3038 Part 2. Average values and peak values are also possible.

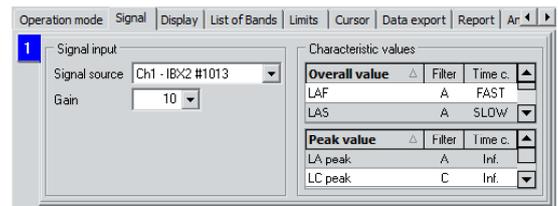
Application

For the monitoring of highly sensitive devices, such as electron microscopes or lithography systems, an analysis of the 1/3 octave bands (thirds) has proven its value. This analysis is used especially in the semiconductor industry. Limit value curves (Vibration Criteria, VC lines) are defined for various usage criteria. Further nano lines have been agreed, especially for applications in nanotechnology. The InnoAnalyzer Octave instruments are specially designed for monitoring VC and nano lines.

Octave band analyses are also used for acoustic measurements. Thus, the (weighted) levels of the individual bands on a large frequency range can be recorded at a glance.



Limits can be selected (e.g. VC-lines) or individually be set up



A frequency weighting (effective value and peak value) for acoustic measurements can be selected.

Properties

Measurement quantities, units and limit value curves (VC-A .. VC-G, Nano-D, Nano-E, Nano-EF) are already preset for measurements of VC and nano lines according to VDI 2038 Part 2. In addition to the displayed effective values, peak values can also be displayed.

For acoustic measurements, frequency weightings for effective and peak values as well as limit value curves can be freely selected.

Band amplitudes are automatically found and listed, the values can also be displayed directly in the chart if required. In addition, two cursors with measured value display provide support during analysis. It is easy to transfer the measurement curve as a graphic or as pairs of values in text format to other applications

During unattended operation, analyses can be saved periodically or limit dependent or be sent via e-mail.



Technical Data

InnoAnalyzer Ocatve Pro	
Signal Processing	
Measurands	Alternating measurands: Vibration acceleration, velocity, displacement; force, pressure, sound pressure, voltage, user-defined measurands
Integrated Measurands	Acceleration → Speed → Displacement
Units	m/s ² , mm/s ² , μm/s ² , nm/s ² , pm/s ² , g, mg, μg, km/s ² , kg, dB m/s, mm/s, μm/s, nm/s, pm/s, in/s, mil/s, μin/s, dB m, mm, μm, nm, pm, ft, in, mil, μin, dB bar, mbar, MPa, kPa, hPa, Pa, mPa, μPa, nPa, psi Sound evaluated
Characteristics	Peak value, Peak-to-peak value, r.m.s. value, phase
Measurands and Units X-Axis	Frequency (Hz) / Rotation speed (1/min) / Rotation speed order
Frequency Range	preset vor VC and nano lines (1... 100 Hz) as well as for acoustics (20.. 20 000 Hz, freely selctable 0.1.. 40 000 Hz
FFT Modes	free settings, ISO, VC, Nanon lines, acoustics
Graphical Presentation	
Number of Graphs	1 .. 4 for magnitude and 1..4 for phase per window
Refresh	1 / 8 / 16 times per second *
Interval Y-Axis	Magnitude: 0.1 .. 10000 (logarithmic as well)
Interval X-Axis	1 .. 40 000 Hz /6 .. 2 400 000 U/min ** / 600 .. 2 400 000 min ⁻¹ **
List of Magnitudes	1..45 magnitudes (search sensitivity adjustable), sorting acc. to magnitude or frequency
Cursors	2 lines, freely adjustable by mouse or button, display of cursor values and difference
Limit Graph	Graphically free adjustable with 100 points (free settings + acoustic mode9, VC-A .. VC-G, Nano-D, Nano-E, Nano-EF
Status Indicators	Sensor, measuring channel, measurand, characteristic, gain, underload, overload, level
Data Export	
Control	Manually time- or level-triggered
Formats	Bitmap, PNG, Enhanced Meta File (EMF), text
Destinations	Clipboard or file
Event Annunciators	
E-Mail	Trigger initiates tranfer of exported measurement data
Miscellaneous	
Available in a Kit	VMSet-25
General Functions	Measurement data is held after switching off, module is cloneable

* Centrally managed in the InnoMaster

** when working with InnoBeamer LX2: Upper frequency limit 3200 Hz = 192 000 min⁻¹

Changes without prior notice

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