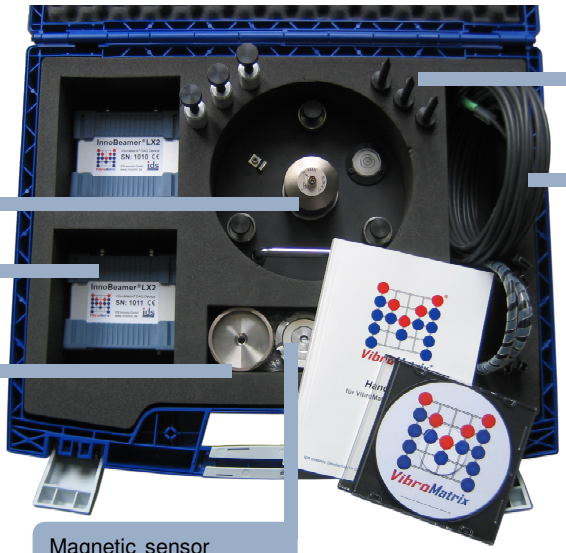
VibroMatrix® Kit

Measuring Building Vibration



The VMSet-22, -23 and -24 come in a handy case and provide you with everything you need for the measurement of vibrations on buildings acc. to DIN 4150.

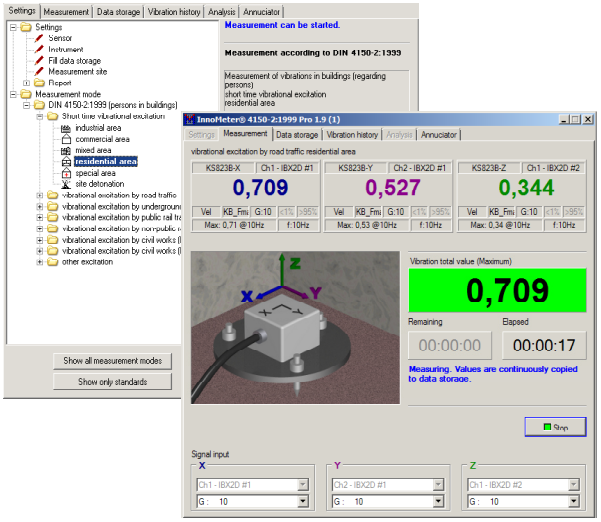
Vibrations in all three axes can be measured simultaneously. The complete solution offers more than small hand-held units:

- The program guides you through the measurement reliably, with clear indications and graphics.
- Measured values as well as an assessment (red / yellow / green) are already indicated during the measurement.
- Each measurement is automatically transferred to the data storage with time stamp and can be completed with your own remarks.
- Alarm by e-mail, lamps or horns can be added.
- The Pro version additonally offers displaying the signal course and a frequency analysis of each event. Thus, each excceedance can be followed in detail if required.

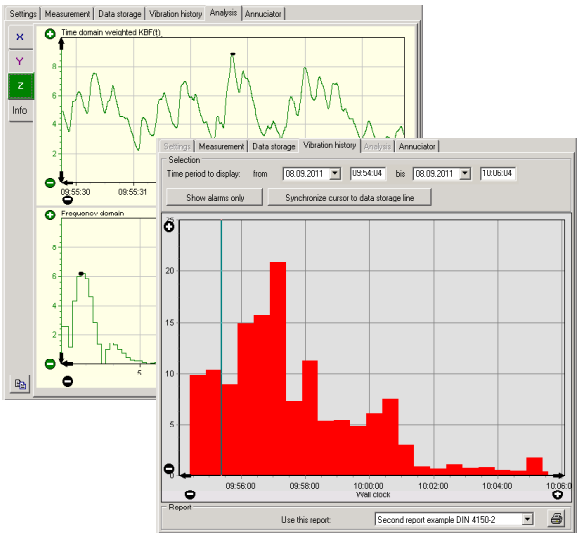
	VMSet-22-1	VMSet-23-1	VMSet-23-2	VMSet-24-1
Hardware				
Sensor for Vibration Measurement	**1x Piezoelectric accelerometer, shear design** - Sensitivity: 500 mV/g, linear frequency range: 0.07 .. 6000 Hz - Operating temperature: -30 .. 90 °C - Accessories: Clamping magnet, wall adapter, tripod plate with screwable feet, 10m cable, cable adapter to 3x BNC			
USB Box for Digitization	**2x 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			
Software Licenses				
InnoMeter 4150-2 Pro	3x		-	3x
InnoMeter 4150-3 Pro	-	3x	6x	3x

InnoMeter® 4150-2 1.9

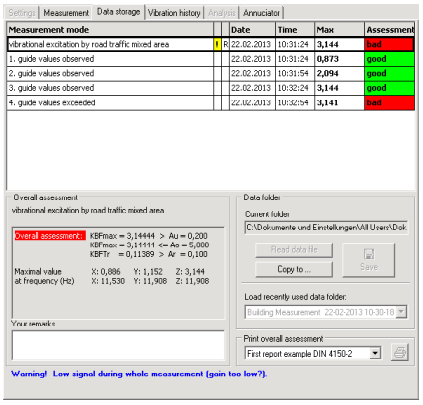
Vibration effects on persons in buildings



Clearly arranged selection and execution of the measurement



Graphical event overview and event analysis



Automatic event storage

Application

The InnoMeter 4150-2 is designed for the measurement of vibrations in buildings assesses the effect on persons acc. to DIN 4150-2.

Persons in buildings are exposed to vibrations from heavy building activities, traffic, machine operation or also detonations. The InnoMeter 4150-2 measures these vibrations, immediately evaluates them acc. to the standard and informs about the occurred vibrations and their permissibility at any time.

Suitable kits incl. sensors and signal concerters for connection to your own computer are available: VMSet-22(P) and VMSet-24(P).

Properties

The InnoMeter 4150-2 combines vibration measurement, automatic evaluation and presentation of results in one instrument. The most important characteristic: A report can be printed at any time since the evaluation is carried out simultaneously with the measurement. Circuitous data transfer is not required here. You are ready for giving a statement at any time.

The German standard DIN 4150-2 describes a multi-level system for deciding whether vibrations have a troubling effect on humans in buildings or not. The InnoMeter 4150-2 runs through this decision tree with the currently measured values. Based on these facts, it provides immediate asssessment for the harassments.

You simply select the measurement mode and the type of area. Click the start button and and off you go!

The measured data is available in differently detailed levels: You can see the overall status at once, but you are able to display more details concerning interesting events progressively. Detail depth reaches up to the recorded high-resolution vibration signal.

When it comes to printing a record, the detail depth can be selected as well. The most important data incl. the measurement graph fits on one A4 page. If required, the single events are printed as well. The period for the report to be printed can also be selected.

Automatic transmission of measurement results via e-mail or notification of outsiders about alarms for instance via signal lamps is possible as well.

Technical Data

	InnoMeter 4150-2 Pro	InnoMeter 4150-2
Signal Processing		
Filter	Butterworth filter acc. to the standard with 40dB/decade, 1..80 Hz; frequency weighting filter acc. to DIN 4150-2	
Measurand	Weighted vibration severity acc. to DIN 4150-2	
Characteristics	Maximum weighted vibration severity KB_{Fmax} and KB_{FTi} value	
Measurement Duration	Adjustable 30 s .. infinitely	
Graphical Presentation		
Numeric Display	5 digits: 0.001 .. 99999	
Refresh	1..4 times per second (centrally managed in InnoMaster)	
Status Indicators	Sensor, measuring channel, measurand, characteristic, gain, underload, overload	
Data Acquisition, Storage and Presentation		
Measurement Modes	- Short-time vibrations / vibrations caused by rail traffic / vibrations caused by civil works / other vibrations in: - Industrial / commercial / mixed / residential / special areas	
Measurement	- User guide - Selection of the measurement mode - Selection of the location - Indication of elapsed and remaining measurement duration - Indication of the maximum weighted vibration severity KB_{Fmax} for all axes - Indication of the current main frequency for all axes - Indication of the vibration total value (maximum of the 3 axes	
Automated Evaluation	Calculation of KBFmax and KBFTr value already during measurement and comparison with guide values Au, Ao, Ar acc. to the standard. Indication in traffic light colors.	
Data Storage	- Data storage of up to 100000 events with detailed data for each time interval - For marked measurement: Indication of KB_{FTi} and further measurement values, evaluation - You can note own remarks for each event - Saving and reload measured values in CSV format - Printing a report about overall assessment, individual report templates can be configured	
Integrated Graphical Evalutions		
Vibration History	- Expanding and compressing both Y- and time-axis - Y-axis optionally as absolute values or relative to the limit value in % - Time period to be selected by input boxes - Warnings can be displayed/omitted - Cursor available, movable by mouse, runs synchronously with the time interval in the data storage - Printing a report about the selected time period, individual report templates can be configured	
Analysis Single Event	- Signal progression of weighted vibration velocity - Automic marking of the maximum in the signal progression - Frequency analysis of the time interval	-
Event Annunciators		
Display	Display of total vibration value as well as evaluation of single measurement in traffic light colors	
Radio Switch	Binary signaling of single measurement's evaluation (good/bad)	
Digital Output	Binary signaling of single measurement's evaluation (good/bad)	
E-Mail	- Transfer of total vibration value as well as evaluation of single measurement - Cyclic transfer of the data storage	
Miscellaneous		
Available in a Kit	VMSet-22, VMSet-24	
General Functions	module is cloneable	

Changes without prior notice

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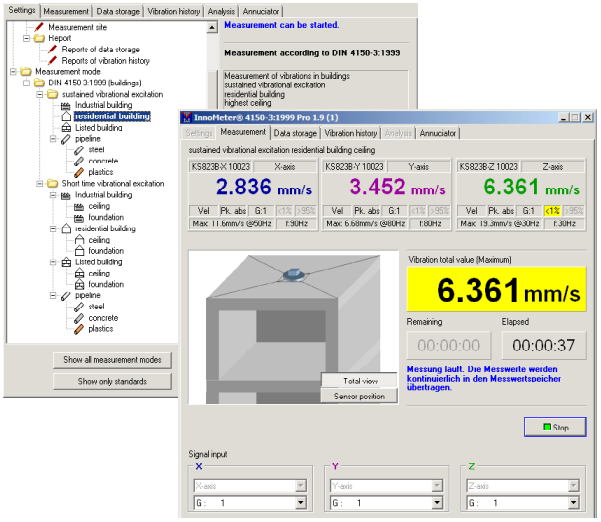
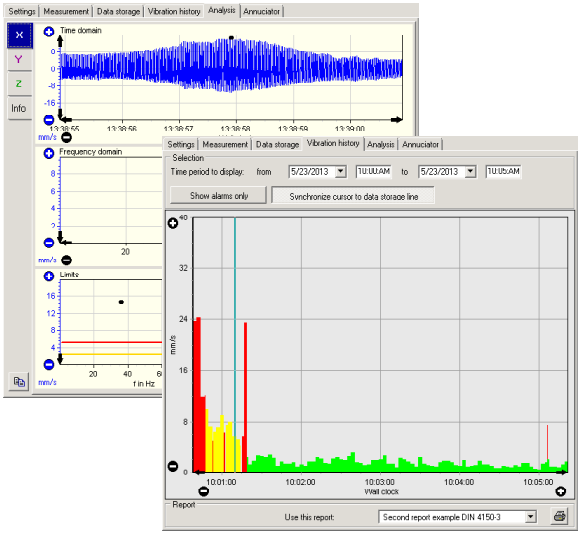
InnoMeter® 4150-3 1.9

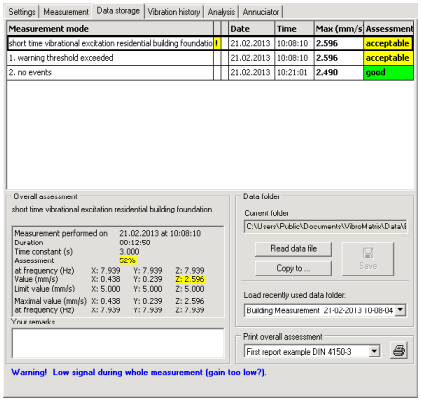
Vibration Measurement on Buildings



Clearly arranged selection and execution of the measurement



Graphical event overview and event analysis



Automatic event storage

Application

The InnoMeter 4150-3 is designed for the measurement of vibrations on buildings acc. to DIN 4150-3 and SBR.

Vibrations from heavy building activities, traffic, machine operation or also detonations affect existing building stock. The InnoMeter 4150-3 measures these vibrations, evaluates them acc. to the standard immediately and can inform about the occurred vibrations at any time.

Therefore, a triaxial vibration sensor is positioned at the building. By means of a signal converter type InnoBeamer, its signals are transmitted to the computer on which the InnoMeter 4150-3 is running.

Properties

The InnoMeter 4150-3 combines vibration measurement, evaluation and presentation of results in one instrument. The most important characteristic: A report can be printed at any time since the evaluation is carried out simultaneously with the measurement. Circuitous data transfer is not required here. You are ready for giving a statement immediately and at any time.

In the German standard DIN 4150-3 the main frequency is an important parameter as it determines the maximum allowable vibration level. The main frequency recognition is a problem for many instruments but not for InnoMeter 4150-3: It features a permanently active, automatic frequency recognition and achieves exact results with 4 million analyses/day.

The measured data is available in differently detailed levels: You can see the overall status at once, but you are able to display more details concerning interesting events progressively. Detail depth reaches up to the recorded high-resolution vibration signal. This way, analysis with additional software can be carried out easily.

When it comes to printing a record, the detail depth can be selected as well. The most important data incl. the measurement graph fits on one A4 page. If required, the single events are printed as well. The period for the report to be printed can also be selected.

Automatic transmission of measurement results via e-mail or notification of outsiders about alarms for instance via signal lamps is possible as well.

Technical Data

	InnoMeter 4150-3 Pro	InnoMeter 4150-3
Signal Processing		
Filter	Butterworth filter acc. to the standard with 40dB/decade, selectable 1..80 Hz and 1..315 Hz	
Measurand	Vibration velocity (vibration severity) in mm/s	
Parameter	Peak value of vibration velocity, instantaneous main frequency	
Measurement duration	Selectable 10 s .. infinitely	
Graphical Presentation		
Numeric Display	5 digits: 0.001 .. 99999	
Refresh	1 .. 4 times per second (centrally managed in InnoMaster)	
Status Indicators	Sensor, measuring channel, measurand, parameter, gain, underload, overload	
Data Acquisition. Storage and Presentation		
Measurement Modes	- Sustained vibrational excitation / Short-time vibrational excitation: - Industrial / residential / listed buildings - Pipelines: Steel / concrete / plastics	
Measurement	- User guide - Choice of the measurement mode - Indication of elapsed and remaining measurement duration - Indication of the peak value for all axes incl. main frequency for all axes - Indication of the maximum vibration value so far incl. respective main frequency - Indication of the vibration total value (maximum of the 3 axes)	
Data Storage	- Data storage of up to 100000 events with detailed data for each event - You can note own remarks for each event - Saving and reload measured values in CSV format - Printing a report about single event, individual report examples can be configured	
Integrated Graphical Evaluations		
Vibration history	- Expanding and compressing both Y- and time-axis - Y-axis optionally as absolute values in mm/s or relativeto the limit value in % - Time period to be selected by input boxes - Warnings can be displayed/omitted - Cursor available, movable by mouse, runs synchronously with the event in the data storage - Printing a report about the selected time period, individual report examples can be configured	
Analysis Single Event	- Signal progression of vibration velocity - Automic marking of the maximum in the signal progression - Frequency analysis of the event - Automic marking of the maximum in the frequency analysis - Evaluation of the event in the InnoMeter 4150-3 limit-value-graphic	-
Event Annunciators		
Display	Display of total vibration value as well as evaluation of single measurement in traffic light colors	
Radio Switch	Binary signaling of single measurement's evaluation (good/bad)	
Digital Output	Binary signaling of single measurement's evaluation (good/bad)	
E-Mail	- Transfer of total vibration value as well as evaluation of single measurement - Cyclic transfer of the data storage	
Miscellaneous		
Available as a Kit	VMSet-23 VMSet-24	
General Functions	module is cloneable	

Changes without prior notice

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