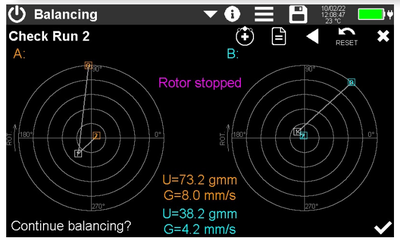
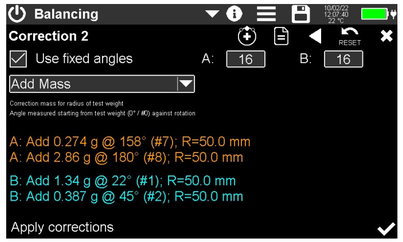
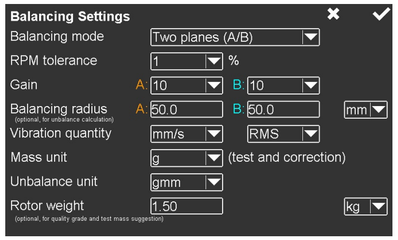
VM100-BAL: Balancing System (Option)

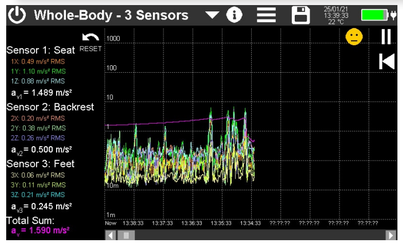


- Field balancing in one or two planes
- User guidance
- Fixed/free angles for mass changes
- Keep/remove test mass
- Combination of correction weights
- Photoelectric reflex switch VM100-PS as angle sensor
- Balancing report as CSV file
- Recommended sensors: KS80D; KS74C100



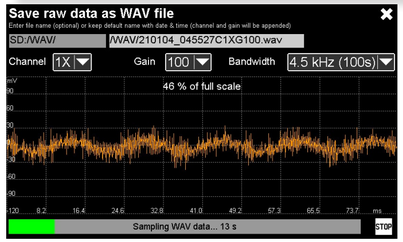


VM100-HA/WB1/WB3: Human Vibration Measurement (Option)



- VM100-HA: Hand-arm vibration for one or two hands to ISO 5349
- VM100-WB1: Whole-body vibration for health and comfort evaluation based on RMS or VDV measurements to ISO 2631
- VM100-WB3: Whole-body vibration for health and comfort evaluation with 3 triaxial sensors to ISO 2631and GB/T 4970
- Plots the time graph in 1 s intervals for up to 10 hours
- Calculation of daily exposure A(8) to guideline 2002/44/EC
- Recording of time data and test report as CSV file
- Recommended sensors:
  VM100-HA: KS963B10
  VM100-WB1/WB3: KS963B100-S (seat pad accelerometer)

Raw Data Recording (Included)



- Records the amplified sensor signal at 4.5 kHz or 20 kHz sample rate for 100 or 20 seconds
- WAV (Waveform Audio Format)
- Scope style display of the measured waveform
- Independent of licensed function modules

Technical Data

	VM100A	VM100B
Sensor input channels	9 (three 4 pin *Binder* 712 sockets)	3 (one *Binder* 712 4 pin socket)
Infrared temperature sensor	Built in	-
IEPE sensor supply	4 mA / 24 V	
TEDS (Transducer Electronic Data Sheet)	IEEE 1451.4; templates 25, 27, 28	
Measurement point identification	NFC reader; compatible with type A, B, F and V tags	
Tacho input	Yes; 24 V; 7 pin *Binder* 712 socket	
Data acquisition	24 bit Sigma-Delta ADC, one per input, fully simultaneous	
Analog gains	1 / 10 / 100 / Auto	
Measurement range	0.1 µm/s² to 10 000 m/s² (depending on transducer sensitivity)	
Accuracy	<1 % at reference conditions	
Resolution	>90 dB SNR	
Overall values in time domain	RMS (1 s); RMS (infinite); peak; peak-peak; peak hold; crest	
Filtering in time domain	34 Butterworth two-pole high pass filters from 0.2 to 5000 Hz 38 Butterworth two-pole low pass filters from 10 to 24 000 Hz Single integration for velocity; double integration for displacement	
Human vibration weighting filters	Wb; Wc; Wd; We; Wh; Wj; Wk; Wm	
Human vibration modes	Hand-arm (1 or 2 triaxial sensors/hands) Whole-body (1, 2 or 3 triaxial sensors); RMS and VDV	
Data plotter in time domain and human vibration	1 value per second; max. 10 hours	
Frequency analysis (FFT)	3 channels 1 Hz to 22 kHz 1024 to 65 536 lines >0.1 Hz resolution Y axis: linear / logarithmic Windowing types: Hann(ing); Hamming; Flattop; Rectangular Averaging: 1 to 16 spectra Triggering: auto; amplitude; tacho input Waterfall mode; spectrogram mode (1 channel) Peak hold mode	
Interface / charge connector	USB type C; mass storage device	
Data memory	Micro SD card; 2 GB; FAT file system; CSV, BMP or WAV files	
Operating temperature range	-20 to 60 °C; <95 % relative humidity without condensation	
Power supply	Buit-in NiMH battery; 9 Ah; operating time 10 to 14 hours	
Screen	TFT RGB touch screen; 7”; 800 x 480 pixels	
Dimensions, weight	215 mm x 150 mm x 50 mm; 1.3 kg	
Accessories (included)	Carrying case with instrument, USB cable and USB charger, manual	
Optional accessories	Licenses VM100-MAC; VM100-ENV; VM100-RPM; VM100-VC; VM100-BAL; VM100-HA; VM100-WB1; VM100-WB3 IEPE accelerometers, depending on application 034-B711-BNCf: Sensor adapter cable to 3 BNC female plugs VM100-LS photoelectric reflex switch with magnetic stand for rpm measurement with tacho input	

Trusted Quality Since 1959

In the late 1950s Metra started manufacturing piezoelectric accelerometers and vibration meters. Making both sensors and instruments in our house ensures high quality and design flexibility.

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VM100A
VM100B

Your Vibration Toolkit

Vibration Analyzers

Manfred Weber
Metra Meß- und Frequenztechnik in Radebeul e.K.

2023

The VM100 vibration analyzer was designed for the typical tasks of vibration measurement in laboratories and production facilities. Despite its large range of functions, the main focus was on ease-of-use.

The instrument software is modular, so you only need to pay for what you need. New functions can be added later on.

The compact unit provides up to nine IEPE compatible sensor channels which is an outstanding feature.

All commercially available IEPE accelerometers can be connected. Please choose from our wide range of vibration sensors.

In addition, some modules support measurements with IEPE type sensors for force and pressure and with IEPE microphones.

Key Features

- Fully touch operated, simple and intuitive design
- 9 (VM100A) or 3 (VM100B) IEPE sensor channels with TEDS support
- Simultaneous 24 bit data acquisition for high accuracy
- Bandwidth 0.4 Hz to 24 kHz
- Tacho input
- NFC detection of measurement points for route measurement and saving
- Raw signal recording
- Standard data formats (CSV, BMP, WAV); no special software required
- IP65 protection grade

Applications

- Simultaneous measurement and plot of up to 9 overall vibration values
- Vibration analysis using FFT
- Machine monitoring by means of route-based measurements
- Envelope analysis for roller bearing diagnostics
- Run up / coast down tests, resonance finding
- Balancing with one or two planes
- Human vibration measurement: hand-arm and whole-body
- Third-octave analysis for the measurement of extremely low vibrations: “VC” and “Nano” criteria

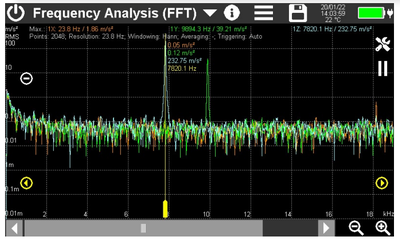
Function Modules

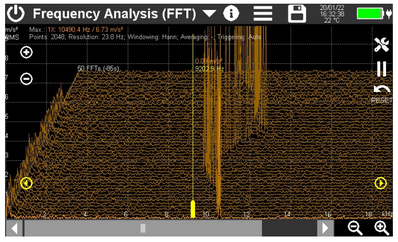
- **VM100-AMP**: General time domain measurement (included)
- **VM100-FFT**: Frequency analysis (included)
- **VM100-RPM**: Amplitude over rotational speed (option)
- **VM100-MAC**: Machine monitoring, route-based (option)
- **VM100-ENV**: Envelope analysis for roller bearing diagnosis (option)
- **VM100-BAL**: Balancing with one or two planes (option)
- **VM100-VC**: Third-octave analysis for extremely low vibrations: “VC” and ”Nano” criteria (option)
- **VM100-HA**: Triaxial hand-arm vibration measurement to ISO 5349 (option)
- **VM100-WB1**: Triaxial whole-body vibration measurement to ISO 2631 (option)
- **VM100-WB3**: 9-channel whole-body vibration measurement to ISO 2631 and GB/T 4970 (option, only for VM100A)

VM100-AMP: Time Domain Measurement and Recording (Included)

- Measure and plot for up to 9 channels acceleration, velocity, displacement or other physical quantities
- RMS (1 s and infinite), peak(-peak), peak-hold and crest
- High pass and low pass filters from 0.2 Hz to 24 kHz
- Up to 10 hours plot time
- CSV recording of 1 measurement per second on SD card

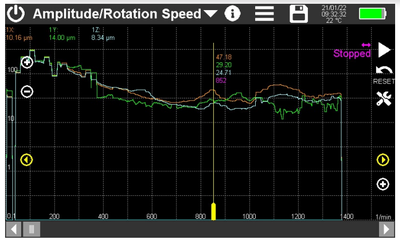
VM100-FFT: Frequency Analysis (Included)





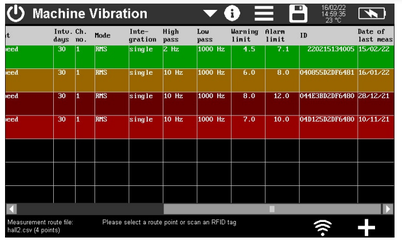
- FFT for up to 3 channels acceleration or other physical quantities
- 1 Hz to 4.5 kHz or 22 kHz frequency range
- 1024 to 32768 points FFT, visible: 460 to 14 900 points
- Resolution: 0.1 to 47.7 Hz
- Windowing: Hann(ing), Hamming, Flattop, Rectangular
- Averaging
- Maximum hold
- Waterfall mode for up to 50 FFTs with 1 channel
- Spectrogram mode
- Measurement cursor
- Trigger modes: Auto, amplitude, tacho input
- Saving on SD card as CSV table or BMP screenshot

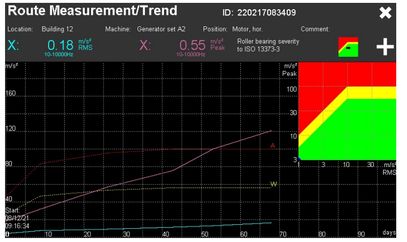
VM100-RPM: Amplitude / Rotational Speed (Option)

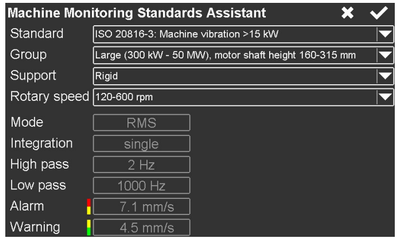


- Plots the RMS of up to 9 channels acceleration, velocity or displacement over rotational speed
- High pass and low pass filters from 0.2 Hz to 4 kHz
- For run up / coast down tests of machines
- For finding resonances
- Resolution can be changed to increase/decrease measurement duration
- Measurement cursor
- Uses photoelectric reflex switch VM100-PS at tacho input
- Saving on SD card as CSV table or BMP screenshot
- Recommended sensors: KS84.100; KS74C100

VM100-MAC: Machine Monitoring, Route Measurement (Option)

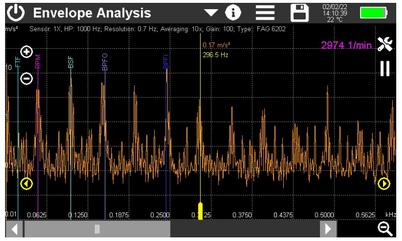






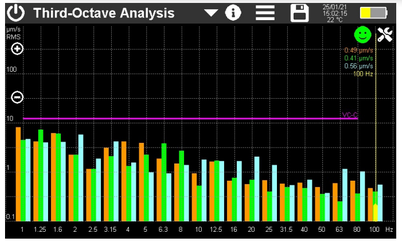
- Measures and monitors machine vibration as part of predictive maintenance
- Keeps track of large numbers of measuring points using NFC identification
- Manages measuring routes
- Built-in support for monitoring of turbines, pumps, compressors, gear boxes and other machines to ISO 20816
- Monitors roller bearings to ISO 13373-3
- Plots trend diagrams
- Storage of CSV reports
- Recommended sensors: KS84.100; KS74C100

VM100-ENV: Envelope Analysis for Roller Bearing Diagnosis (Option)



- Effective tool for the evaluation of roller bearings
- Based on the measured rotation speed and bearing geometry characteristic fault frequencies for inner and outer race, rolling elements and cage are marked in the envelope vibration spectrum
- Manages a list of bearings
- Storage of CSV reports
- Recommended sensors: KS84.100; KS74C100

VM100-VC: Third-Octave Analysis for “VC” and “Nano” Criteria (Option)



- “VC lines” are a widespread method for the evaluation of vibration with regard to different levels of precision manufacturing, especially in the semiconductor industry
- The method uses the third octave spectrum of vibration velocity from 1 to 80 Hz
- Particularly strict “Nano” criteria are used in nanotechnology
- Peak hold function
- Recording at limit exceedance for long-term monitoring
- Recommended sensors:
  KB12VD (uniaxial) down to VC-G / Nano-EF
  KS48C (uniaxial) and KS823B (triaxial) down to VC-D