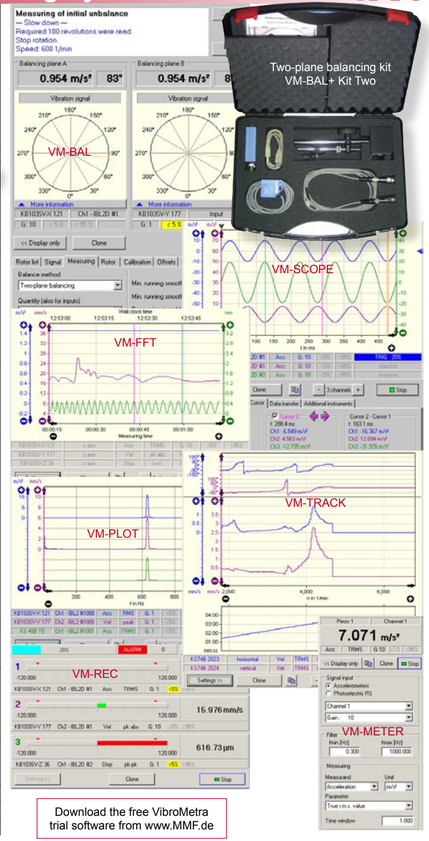
VibroMetra PC Vibration Measuring System

Why choose VibroMetra?
- Designed for vibration measurement - No ballast by unwanted functionality.
- VibroMetra is modular making it particularly economic with fewer channels.
- Also supports IEPE compatible microphones, force and pressure transducers.
- Off-line measurement: The system saves raw data in the background for later analysis.
- The necessary hardware is very compact making it particularly suited for mobile use.
- Simple plug & play installation.
- Short training time. After a few minutes you may start with the first measurement.
- Data export in common graphics, text and binary formats.
- Updates are free of charge. You will always have access to the latest software versions.

Hardware:	M302	M312
IEPE / USB Interfaces		
	Inputs: 2 IEPE, 1 digital trigger Bandwidth: 0.3 to 2000 Hz	2 IEPE, 1 digital trigger, 2 DC 0.1 to 40,000 Hz

Available Software Instruments:

Balancing System *VM-BAL*	• Balancing of long and disk-shaped rotors in one or two planes • Automatic operation by rotary speed detection • User guidance by clear text instructions • Display of measuring results as polar graphic and numbers • Up to six correction methods (correction mass, drilling, milling, rotary rings, set screws, list of predefined correction masses) • Report function • Extremely compact - *VM-BAL Kit* fits into a small carrying case
Real-time signal display *VM-SCOPE*	• Displays and records short vibration events, e.g. for drop testing • Memory for 10 second post and 1 second pre trigger • Two measuring cursors • Vibration acceleration (*VM-SCOPE+* also for velocity and displacement) • Up to four signals in one window without delay
Y/t Vibration Plotter *VM-PLOT*	• Long-term recording and display for slow changing vibration events • All measuring functions of *VM-METER* • Zoom and scroll functions • Vibration acceleration (*VM-PLOT+* also for velocity and displacement) • Up to four signals in one window without delay
Vibration Analyzer *VM-FFT*	• Five window functions, high frequency resolution • RMS and peak spectrum • Bearing analysis functions • Power density spectrum • User-defined curves for alarms at critical magnitudes, e.g. for quality testing • Vibration acceleration (*VM-FFT+* also velocity and displacement) • Up to four signals in one window without delay • Two measuring cursors
Tracking Analyzer *VM-TRACK*	• Magnitude and phase displayed as function of the rotary frequency • Quick detection of resonances • Vibration acceleration (*VM-TRACK+* also velocity and displacement)
Data Recorder *VM-REC*	• Real-time recording in binary or text format with adjustable trigger • All measuring functions of *VM-METER* with value display • Bar graph and numeric display • Pre and post triggering • Vibration acceleration (*VM-REC+* also velocity and displacement)
Vibration Meter *VM-METER*	• RMS, positive, negative and unsigned peak values, instantaneous value • Vibration acceleration, velocity and displacement • *VM-METER+* also for phase distortion, main frequency and RPM
VM-STRUC	See building vibration
VM-BODY	See human vibration
VM-HAND	See human vibration



Download the free VibroMetra trial software from www.MMF.de

Human Vibration

PC Based Human Vibration Measurement

Hand-Arm Vibration Meter *VM-HAND*	
Hardware	Triaxial IEPE (KS943B.10) with 2 M302 USB devices
Weighting filter	Wh to ISO 8041 / ISO 5349
Calculations	Interval RMS of three axes Total vibration value Ahv Daily vibration exposure A(8) with different activities
Memory	Up to 10 000 measurements, Text or CSV (Excel) export
Other features	User guidance, report function
Whole-Body Vibration Meter *VM-BODY*	
Hardware	Triaxial IEPE (KB103SVD) with 2 M302 USB devices
Weighting filters	Wb, Wc, Wd, Wj, Wk and Wm to ISO 8041 / ISO 2631
Calculations	RMS, max. RMS (MTVV) and crest factor of three axes Total vibration value Ahv
Memory	Up to 10 000 measurements, Text or CSV (Excel) export
Other features	User guidance, report function

Human Vibration (continued)

Human Vibration Meter VM31 NEW

Inputs	4 IEPE channels
Measuring modes	Hand-Arm vibration Whole-body vibration Acceleration Velocity Displacement
Display modes	Running RMS Interval RMS Maximum RMS (MTVV) Peak value Max. peak value Total Vibration Value (a_{wv}) Vibration dose value (VDV) Crest factor
Band filters	0.4 - 100 Hz (W/B unweighted) 6.3 - 1259 Hz (H/A unweighted) 0.1 - 2000 Hz (acc.) 1 - 1000 Hz (acc.) 2 - 300 Hz (vel.) 10 - 1000 Hz (vel.) 5 - 250 Hz (displacement)
Weighting filters to ISO 8041	Hand-Arm: Wh Whole-body: Wb, Wc, Wd, Wj, Wk, Wm
Data recording	up to 100,000 records
PC data transfer	USB interface, CSV conversion and A(8) calculation tool included

Size: 120 mm x 65 mm x 25 mm
Power supply: 3 AAA cells or USB

Available kits:
VM31-WB (Whole-Body Kit)
VM31-HA (Hand-Arm Kit)
VM31-HAWB (Hand-Arm and Whole-Body Kit)

Machine Monitoring

Vibration Meters

Model	VM22	VM24	VM25
			
Accelereration	-	0.1 - 240 m/s² 0.2 - 10,000 Hz 3 - 1000 Hz 1000 - 10,000 Hz	0.1 - 240 m/s² 0.2 - 10,000 Hz 3 - 1000 Hz 1000 - 10,000 Hz
Velocity	0.1 - 1000 mm/s 10 - 1000 Hz (ISO 10816)	0.1 - 1000 mm/s 2 - 300 Hz 10 - 1000 Hz	0.1 - 1000 mm/s 2 - 300 Hz 10 - 1000 Hz
Displacement	-	0.01 - 60 mm 2 - 300 Hz	0.01 - 60 mm 2 - 300 Hz
Parameters	true RMS	true RMS, peak	true RMS, peak, crest, K(t)
Frequeny analysis	-	-	127 lines FFT
Temperature	-	-	-40 - 125 °C infrared, non-contact
Rotary speed	-	-	1 - 9999 rpm, optical
Memory, interface	16,000 values / USB	16,000 values / USB	16,000 values / USB

VMID Measuring Points provide reliable magnetic coupling, identify the measuring point and set the instrument automatically

Vibration Detector • Vibration Switch

Model	VS4	VS6
	 • Built-in accelerometer • No cabling required • Over 1 year battery life • Mounting by central M8 screw • IP65 Machine condition monitoring by LEDs	 • Built-in accelerometer • Relay output • Adjustable delay time • Mounting by central M8 screw • IP65
Monitored Quantity	Vibration velocity to ISO 10816	
Threshold ranges	2.5 - 50 and 10 - 200 mm/s	
Frequency range	3/10 - 1000 Hz	
Output	2 LEDs, pre-alarm / alarm	Relay, form C contact
Power supply	2 AA / Mignon batteries	5 - 30 VDC / < 40 mA
Dimensions (Ø x h)	88 mm x 44 mm	70 mm x 38 mm

Building Vibration

Building Vibration

Model	NEW VM40A	NEW VM40B
Triaxial Building Vibration Monitor includes piezoelectric sensor, electronics for signal conditioning, monitoring, recording and battery		
Supported standards	DIN 4150-3; BS 7385; SN 640312a	
Measuring ranges	Acceleration: 0.01 - 15 m/s²; Velocity: 0.1 - 2400 mm/s at 1 Hz; 0.1 - 30 mm/s at 80 Hz	
Frequency ranges	0.8 - 100 Hz; 0.8 - 395 Hz; 5 - 150 Hz (-3 dB)	
PC interface	USB for transfer of stored data	
SMS alerts	-	Sends SMS at critical levels

	VM-STRUC	VM-STRUC+	VM-PERS	VM-PERS+
PC based measuring system using the IEPE / USB interface M302 and IEPE copmpatible sensors Monitoring and recording of vibration events and raw signal				
Supported standards	DIN 4150-3		DIN 4150-2	
FFT display	no	yes	no	yes

Vibration Monitor

Model	M12
A versatile instrument for most analog signal conditioning requirements: AC, DC, RMS, peak, 4-20 mA, switch	  Accessory for M12: Display module **M12DIS** for connection to 4-20mA output
Vibr. accelereration	10 / 50 / 250 m/s²
Vibration velocity	10 / 50 / 250 mm/s
Vibr. displacement	100 / 500 / 2500 µm
Band pass filter	FB2 low pass and FB3 high pass filter; 1 Hz - 50 kHz
Rectification	true RMS or true peak-to-peak
Outputs	DC (RMS and pk-pk); AC wide-band; AC filtered; DC 4-20 mA (isolated)
Relay output	40 VAC/2 A; delay adjustable 0 - 25 s; hold time 2 / 8 s
Display functions	LEDs for alarm, overload and sensor check; LED bar graph vibration level
Sensor input	IEPE
Power supply	12 .. 28 VDC
Dimensions	22 x 76 x 111 mm³

Plug-In Filter Modules for M12, M32 and M208

The plug-in filter modules **FB2** (low pass) and **FB3** (high pass) are available with the following 3 dB cut-off frequencies:

FB2: 0,1 / 0,3 / 0,5 / 1,0 / 3,0 / 5,0 / 10 / 30 / 50 kHz
Butterworth, 4th order low pass

FB3: 2 / 3 / 5 / 10 / 30 / 50 / 100 / 300 / 500 / 1000 Hz
Butterworth, 2nd order high pass

Please check out our website www.MMF.de for the complete range of data sheets, brochures, instruction manuals and demo software or order printed information material.

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Vibration Measurement

Vibration Sensors
Signal Conditioners
Vibration Monitors
Vibration Meters
Vibration Calibrators

60 Years

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

1954 MMF 2014

Vibration Transducers

General Purpose Shear Accelerometers

Model	KS76C10	KS76C100	KS77C10	KS77C100	KS56	KS57	KS72L
					-30 to 250 °C	-30 to 250 °C	Low Pwr. IEPE
Output	IEPE	IEPE	IEPE	IEPE	Charge	Charge	Low Pwr. IEPE
Range	± 600 g	± 60 g	± 600 g	± 60 g	± 4000 g	± 4000 g	± 90 g
Sensitivity	10 mV/g	100 mV/g	10 mV/g	100 mV/g	18 pC/g	18 pC/g	20 mV/g
f_{min} (3 dB)	0.12 Hz	0.13 Hz	0.12 Hz	0.13 Hz	0.1 Hz	0.1 Hz	0.3 Hz
f_{max} (3 dB)	33 kHz	24 kHz	33 kHz	24 kHz	17 kHz	17 kHz	37 kHz
Connector	UNF 10-32	UNF 10-32	UNF 10-32	UNF 10-32	UNF 10-32	UNF 10-32	TNC
Weight	20 gr.	23 gr.	20 gr.	23 gr.	23 gr.	23 gr.	35 gr.
Height	17 mm	17 mm	17 mm	17 mm	17 mm	17 mm	24 mm
Base	17 mm hex.	17 mm hex.	17 mm hex.	17 mm hex.	17 mm hex.	17 mm hex.	19 mm hex.

High Sensitivity Accelerometers

Model	KS48C	KB12VD	KB12
	IP67	Lowest noise	
Output	IEPE	IEPE	Charge
Range	± 6 g	± 0.6 g	± 3 g
Sensitivity	1000 mV/g	10000 mV/g	6500 pC/g
f_{min} (3 dB)	0.1 Hz	0.08 Hz	0.15 Hz
f_{max} (3 dB)	4 kHz	260 Hz	260 Hz
Connector	M12	UNF 10-32	UNF 10-32
Weight	165 gr.	150 gr.	150 gr.
Height	36 mm	37 mm	37 mm
Base	32 mm Ø	48 mm Ø	48 mm Ø

Low Cost Accelerometers

Model	KS78.10	KS78.100	KD37	KD38	KD41	KD42
	with TEDS insulated	with TEDS insulated				
Output	IEPE	IEPE	Charge	Charge	Charge	Charge
Range	± 500 g	± 60 g	± 1000 g	± 1000 g	± 300 g	± 300 g
Sensitivity	10 mV/g	100 mV/g	60 pC/g	60 pC/g	200 pC/g	200 pC/g
f_{min} (3 dB)	0.65 Hz	0.2 Hz	0.1 Hz	0.1 Hz	0.1 Hz	0.1 Hz
f_{max} (3 dB)	23 kHz	22 kHz	15 kHz	15 kHz	11 kHz	11 kHz
Connector	UNF 10-32	UNF 10-32	UNF 10-32	UNF 10-32	UNF 10-32	UNF 10-32
Weight	10.2 gr.	11.2 gr.	45 gr.	45 gr.	60 gr.	65 gr.
Height	15.5 mm	15.5 mm	24 mm	24 mm	29 mm	31 mm
Base	12 mm hex.	12 mm hex.	17 mm hex.	17 mm hex.	19 mm hex.	19 mm hex.

OEM Accelerometers

Model	KS90	KS901.10	KS901.100
High-quality shear-type accelerometers for integration into customer's products		NEW	NEW
Output	Charge	IEPE	IEPE
Range	± 5000 g	± 500 g	± 60 g
Sensitivity	10 pC/g	10 mV/g	100 mV/g
f_{min} (3 dB)	0.1 Hz	0.65 Hz	0.2 Hz
f_{max} (3 dB)	19 kHz	22 kHz	22 kHz
Connector	solder pins, TO-39	UNF 10-32	UNF 10-32
Weight	5.1 gr.	4.6 gr.	5.6 gr.
Size	11 mm x 10 mm Ø	12 mm x 10 mm Ø	12 mm x 10 mm Ø
Mounting	10 mm hole / adhesive	10 mm hole / adhesive	10 mm hole / adhesive

Miniature Accelerometers

Model	KS91B	KS94B10	KS94B100	KS94L	KS95B10	KS95B100	KS93
				Low Power IEPE			
Output	IEPE	IEPE	IEPE	L.P. IEPE	IEPE	IEPE	Charge
Range	± 600 g	± 600 g	± 60 g	± 240 g	± 600 g	± 60 g	± 6000 g
Sensitivity	10 mV/g	10 mV/g	100 mV/g	14 mV/g	10 mV/g	100 mV/g	5 pC/g
f_{min} (3 dB)	0.3 Hz	0.2 Hz	0.5 Hz	0.3 Hz	0.2 Hz	0.5 Hz	0.1 Hz
f_{max} (3 dB)	30 kHz	36 kHz	28 kHz	22 kHz	36 kHz	28 kHz	22 kHz
Connector	integr. cable	Submin. M3	Submin. M3	Submin. M3	Submin. M3	Submin. M3	Subminiat.
Weight	1.0 gr.	2.4 gr.	3.2 gr.	3.2 gr.	2.4 gr.	3.2 gr.	2.7 gr.
Height	7.5 mm	10 mm	10 mm	10 mm	9.5 mm	9.5 mm	7.5 mm
Base	7.8 mm Ø	10.5 mm Ø	10.5 mm Ø	10.5 mm Ø	10.6 mm Ø	10.6 mm Ø	10.6 mm Ø

Industrial Accelerometers

Model	KS74C10	KS74C100	KS80D	KS81B
	insulated	insulated	ATEX IS insulated	IP67 insulated
Output	IEPE	IEPE	IEPE	IEPE
Range	± 600 g	± 60 g	± 55g	± 60 g
Sensitivity	10 mV/g	100 mV/g	100 mV/g	100 mV/g
f_{min} (3 dB)	0.12 Hz	0.13 Hz	0.13 Hz	0.13 Hz
f_{max} (3 dB)	26 kHz	22 kHz	22 kHz	11 kHz
Connector	TNC	TNC	M12	M12
Weight	28.5 gr.	32 gr.	66 gr.	101 gr.
Height	22 mm	22 mm	34 mm	24 mm
Base	16 mm hex.	16 mm hex.	22 mm hex.	36 mm x 22 mm

Triaxial Accelerometers

Model	KS903.10	KS903.100	KS943B10	KS943B100	KS943L	KS813B	KS823B
	NEW with TEDS				Low Power IEPE	IP67	Lowest noise
Output	IEPE	IEPE	IEPE	IEPE	L. P. IEPE	IEPE	IEPE
Range	± 600 g	± 60 g	± 600 g	± 60 g	± 240 g	± 55 g	± 12 g
Sensitivity	10 mV/g	100 mV/g	10 mV/g	100 mV/g	14 mV/g	100 mV/g	500 mV/g
f_{min} (3 dB)	0.1 Hz	0.1 Hz	0.2 Hz	0.5 Hz	0.3 Hz	0.2 Hz	0.07 Hz
f_{max} (3 dB)	20 kHz	10 kHz	22 kHz	22 kHz	19 kHz	10 kHz	6 kHz
Connector	1/4"-28 UNF	1/4"-28 UNF	*Binder 707*	*Binder 707*	*Binder 707*	*Binder 718*	*Binder 718*
Weight	6.5 gr.	9 gr.	14 gr.	16 gr.	16 gr.	115 gr.	365 gr.
Height	14 mm	14 mm	11 mm	11 mm	11 mm	33 mm	58 mm
Base	14 x 14 mm	14 x 14 mm	22 x 20 mm	22 x 20 mm	22 x 20 mm	30 mm Ø	54 mm Ø

Vibration Velocity Sensors

Model	KSI80VC-20	KSI80VC-40	KSI82VB-20	KSI82VB-40
	IP67 insulated		ATEX	
	4- 20 mA velocity output of RMS			
Output	4-20 mA	4-20 mA	4-20 mA	4-20 mA
Range	20 mm/s	40 mm/s	20 mm/s	40 mm/s
Resolution	0.2 mm/s	0.2 mm/s	0.4 mm/s	0.4 mm/s
f_{min} (3 dB)	1.5 Hz	1.5 Hz	10 Hz	10 Hz
f_{max} (3 dB)	1000 Hz	1000 Hz	1000 Hz	1000 Hz
Connector	*Binder 713*	*Binder 713*	*Binder 713*	*Binder 713*
Weight	66 gr.	66 gr.	66 gr.	66 gr.
Height	34 mm	34 mm	34 mm	34 mm
Base	22 mm hex.	22 mm hex.	22 mm hex.	22 mm hex.

Vibration Transducers for Special Applications

Probe Accelerometer

Model	KST94C-4N	KST94C-9N
With movable tip for automated vibration testing in production lines	↔ 5.5 mm stroke	IP62
Output	IEPE	IEPE
Range	± 20 g	± 40 g
Sensitivity	100 mV/g	100 mV/g
Frequ. Range	40 to 3200 Hz (3 dB)	40 to 4500 Hz (3 dB)
Connector	UNF 10-32	UNF 10-32
Length	60 mm	60 mm
Diameter	25 mm	25 mm

Seat Pad Accelerometer

Model	KB103SVD
For triaxial whole-body vibration measurement to ISO 2631	with TEDS
Output	IEPE
Sensitivity	100 mV/g
Cable	2 m
Connector	Plug *Binder* 711
Height	12 mm
Diameter	200 mm
Pad material	silicone rubber

Force Transducer

Model	KF24
For dynamic force measurement with highest resolution	
Output	Charge
Range	+2000 / -300 N
Sensitivity	300 pC/N
Connector	UNF 10-32
Weight	20 gr.
Height	17 mm
Base	16 mm hex.

Mounting and Connection Accessories

Mounting Accessories

Model	Description
021	M3 x 6 mounting stud
003	M5 x 8 mounting stud
043	M8 x 10 mounting stud
022	Adapter M3 (tap) to M5
045	Adapter M5 to UNF 10-32
046	Adapter M5 to ¼"-28
044	Adapter M5 (tap) to M8
106	Insul. flange M3, small
006	Insulating flange M5
206	Insulating flange M8
129	Adhesive insul. pad M3, small
329	Adhesive insul. pad M3, large
029	Adhesive insulating pad M5
229	Adhesive steel pad M8

Model	Description
002	Adhesive wax
108	Magnetic base M3, small
308	Magnetic base M3, large
408	Magnetic base M4 (tap)
008	Magnetic base M5
208	Magnetic base M8 small
508	Magnetic base M8 (tap) large
608	Curve magnet M5
001	Accelerometer probe, M5
140	Handle / curve adapter M3
142	Hand-held adapter M3

Model	Description
130	Triaxial mounting cube M3
030	Triaxial mounting cube M5
230	Triaxial mounting cube M8
330	Triaxial mounting cube M10
700	Underwater pressure hull for accelerometers, < 20 Bar, inner Ø 50 mm

Termination Boxes

Model	Description
801	BNC termination box for 4 sensors
802	BNC DIN rail interface for 4 sensors

801 802 700

Sensor Cables

Model	Type	Plug 1	Plug 2	Temp.	Length
009-UNF-UNF-1,5	Charge/IEPE	UNF10-32	UNF10-32	120 °C	1.5 m
009/T-UNF-UNF-1,5	Charge/IEPE	UNF10-32	UNF10-32	200 °C	1.5 m
009-UNF-BNC-1,5	Charge/IEPE	UNF10-32	BNC	120 °C	1.5 m
009-SUB-UNF-1,5	Charge/IEPE	Submin.	UNF10-32	120 °C	1.5 m
009/T-SUB-UNF-1,5	Charge/IEPE	Submin.	UNF10-32	200 °C	1.5 m
010-UNF-BNC-5	Charge/IEPE	UNF10-32	BNC	120 °C	5 m
010-UNF-BNC-10	Charge/IEPE	UNF10-32	BNC	120 °C	10 m
010-TNC-BNC-1,5	Charge/IEPE	TNC	BNC	120 °C	1.5 m
009-SUB-BNC-1,5	Charge/IEPE	Submin.	BNC	120 °C	1.5 m
084-B713G-PIG-5	4-20 mA	M12 straight	pigtail	80 °C	5 m
084-B713W-PIG-5	4-20 mA	M12 angled	pigtail	80 °C	5 m
085-B713G-PIG-5	IEPE	M12 straight	pigtail	80 °C	5 m
085-B713W-PIG-5	IEPE	M12 angled	pigtail	80 °C	5 m
085-B713G-BNC-5	IEPE	M12 straight	BNC	80 °C	5 m
085-B713W-BNC-5	IEPE	M12 angled	BNC	80 °C	5 m
088-B711f-B711-10	IEPE, triaxial	*Bind*711 fem.	*Bind*711 mal.	80 °C	10 m
088-B718G-B711-5	IEPE, triaxial	*Binder* 718	*Binder* 711	80 °C	5 m
088-B718G-PIG-5	IEPE, triaxial	*Binder* 718	pigtail	80 °C	5 m
091-B707-B711-3	IEPE, triaxial	*Binder* 707	*Binder* 711	120 °C	3 m
034-B711f-BNC	IEPE, triaxial	*Bind*711 fem.	3 x BNC	80 °C	0.5 m

Connection Accessories

Model	From	To
017	UNF 10-32 (female)	BNC (male)
117	UNF 10-32 (female)	BNC (female)
025	UNF 10-32 (female)	TNC (male)
016	UNF 10-32 (female)	UNF 10-32 (female)
031	UNF 10-32 front panel feed-through (2 female)	
032	UNF 10-32 front panel socket (female)	
080G	M12 straight plug with screw terminals	
080W	M12 angled plug with screw terminals	

About Metra

- Metra was founded by Richard Weber in 1954 in Radebeul near Dresden (Germany).
- In the late fifties Metra began to produce piezoelectric sensors.
- During the sixties and seventies Metra developed a broad range of vibration sensors and instruments.
- Metra made its own piezoceramic materials.
- Comprehensive research activities in the field of piezoelectric sensor design.
- In 1970 the first shear-type accelerometers were developed.
- In the eighties Metra grew to one of the largest manufacturers of accelerometers in Europe.
- Today Metra is an internationally established manufacturer of vibration measuring equipment.
- The family business is in the third generation of management.

Highest Quality Standards

- Our sensors and instruments are calibrated traceable to a PTB reference standard.
- Carefully selected piezo materials and artificial aging guarantee long-term stability.
- The standard warranty period is **2 years**.

Learn more about our products at www.MMF.de

Vibration Calibrators

Model	VC20	VC21	VC21D	VC120 NEW
	• Strongest portable vibration calibrators at the market • VC21: World's first portable calibration source for frequencies from 15.92 to 1280 Hz • Load independent • Quartz stabilized frequencies • Accuracy display • Battery powered • Traceable to PTB standard		VC21D with detachable clamping device for the dynamic calibration of non-contact displacement sensors (proximity probes)	• Self-contained vibration calibrating system • Adjustable frequency from 70 Hz to 10 kHz • Frequency sweeps • Sensitivity display with dimension unit • Manual or PC control USB
Frequencies and Accelerations	159.15 Hz (1000 s^{-1}): 10 m/s^2	15.92 Hz: 1 / 2 m/s^2 40 Hz: 1 / 2 / 5 m/s^2 80 Hz: 1 / 2 / 5 / 10 m/s^2 159.2 Hz: 1 / 2 / 5 / 10 / 20 m/s^2 320 Hz: 1 / 2 / 5 / 10 / 20 m/s^2 640 Hz: 1 / 2 / 5 / 10 / 20 m/s^2 1280 Hz: 1 / 2 / 5 / 10 / 20 m/s^2	15.92 Hz: 1 / 2 m/s^2 40 Hz: 1 / 2 / 5 m/s^2 80 Hz: 1 / 2 / 5 / 10 m/s^2 159.2 Hz: 1 / 2 / 5 / 10 / 20 m/s^2 320 Hz: 1 / 2 / 5 / 10 / 20 m/s^2 640 Hz: 1 / 2 / 5 / 10 / 20 m/s^2 1280 Hz: 1 / 2 / 5 / 10 / 20 m/s^2	70 - 10 000 Hz by hand or serial interface, 1 m/s^2
Accuracy	± 3 % at 10 to 40 °C; 5 % at -10 to 55 °C			± 3 % at 70 - 1000 Hz; ± 5 % at 1000 - 10 000 Hz; 23 °C ± 10 °C
Maximum load	600 gr.	500 gr. (depending on frequency)		400 gr.
Sensor mounting	M5	M5	M5, M6x0.5, M8x1, M10x1, M14x1, M20x1, 1/4"-28, 3/8"-24, 1/2"-20	M5; thread adapters included
Display	OLED for magnitude and frequency	OLED for magnitude and frequency	OLED for magnitude and frequency	LCD for charge, IEPE and voltage sensitivity and frequency
PC interface	-	-	-	USB; PC software for setup, sweep and data base included
Power supply	Built-in accumulator or mains plug adapter / charger			Built-in accumulator or external mains adapter / charger

Charge and IEPE Amplifiers

Model	M68D1	M68D3	M68R1 (1)	M70 NEW	M208A	M208B	M28	M32	IEPE100
					M208A with integrated web server for remote measurement and operation				Remote Charge Converter Input: Charge Output: IEPE
Inputs	Charge / IEPE			Charge / IEPE	IEPE		IEPE		Charge
Input connector	BNC			BNC	BNC		BNC		BNC
Channels	1	3	1	1	8		1		1
Charge gain	0.1 / 1 / 10 / 100 / 1000 mV/pC; rotary switch			0.1 - 10000 mV/pC	-		-		0.1 / 1 / 10 mV/pC (2)
Voltage gain	0 / 20 / 40 / 60 dB; rotary switch			0 - 80 dB	0.1 to 1000 incr.	1 / 10 / 100 / 1000	1	1 / 10 / 100	-
Sensitivity tuning	-			yes	yes	-	-	-	-
Integration	none (accel.); single (velocity); double (displacement)				with plug-in integrator modules		-	-	-
Frequ. range	0.1 Hz - 50 kHz			0.1 Hz - 50 kHz	0.1 Hz - 100 kHz		0.1 Hz - 100 kHz	0.1 Hz - 50 kHz	0.1 Hz - 65 kHz
High pass	0.1 / 3 Hz; rotary switch			0.1 / 3 Hz	plug-in filters 3 to 1000 Hz		-		-
Low pass	0.1 / 0.3 / 1 / 10 / 20 / 50 kHz; rotary switch			0.1 / 1 / 10 / 50 kHz	plug-in filters 0.1 to 100 kHz		-	Plug-in filter FB2	-
TEDS support	-			yes	yes	-	-		yes (option)
Dig. interfaces	-			USB	serial; Ethernet	-	-		-
Meter display	-			-	RMS / peak	-	-		-
Relay output	-			-	with adj. threshold	-	-		-
Indicators	IEPE; overload; low level				IEPE; overload; low level		IEPE, power		-
Power supply	4 x Mignon or 5 - 15 VDC	5 - 15 VDC or mains adapter		+ 5VDC or USB	10 - 28 VDC or mains adapter		5 - 15 VDC or mains adapter		4 - 20 mA IEPE supply
Dimensions	105 x 40 x 150 mm³	105 x 90 x 150 mm³	7MU x 3HU x 190 mm	4MU x 3HU x 170 mm	483 x 44 x 124 mm³		33 x 59 x 44 mm³	56 x 59 x 44 mm³	44 mm x 24 mm Ø

(1) Rack case with mains supply for 6 units (**M68B6**) or 12 units (**M68B12**) available.

(2) IEPE100 has 3 gain ranges selectable by DIP switches.