



MODEL 9110D

# PORTABLE VIBRATION CALIBRATOR

- Create Calibration Certificates for Vibration Instrumentation
- Calibrate Vibration Analyzers & Meters In-House
- Confirm Critical Vibration Shutdown Alarms & Logic
- Detect Sensor Drift & Amplified Outputs at Key Frequencies
- Prevent Early or Late Shutdowns Due to Proximity Probe Errors
- Compliance to API 670 & ISO 9001

## TYPICAL APPLICATIONS

- In-House Calibration of Vibration Instrumentation
- Safety Instrumented Systems (SIS)
- Loop Checks & System Troubleshooting, DCS & PLC
- Proximity Probe Testing and Checks for Mismatched Systems
- On-Turbine Vibration Sensors & Charge Amplifiers

## LAB ACCURACY TO THE FIELD

The 9110D Portable Vibration Calibrator is the ideal tool for checking accelerometers, velocity transducers, and proximity probes over a wide operating frequency and amplitude range. The unit is a compact, battery-powered, and completely self-contained vibration reference source, which can be conveniently used to calibrate individual sensors, vibration switches, and data collectors, as well as to validate the entire measurement channel of a condition monitoring or recording system. An integral precision quartz reference accelerometer and closed-loop level control gives the 9110D enhanced stability and superior vibration calibration over an extended 5 Hz to 10 kHz frequency range. Packaged in a rugged Pelican® Storm case, the 9110D is always ready for travel to test sites, bringing laboratory accuracy to the field.

Additional features include an ICP®, voltage, charge mode or modulated current test sensor input for direct connection and readout of the most common types of accelerometers and velocity transducers. The test sensor sensitivity is calculated and displayed on the screen in real time. The unit's internal memory capability can store up to 500 calibration records, and data can be easily transferred to a computer through a USB flash drive. This allows for the creation and printing of ISO 17025-compliant, customizable calibration certificates and reports using the supplied Excel® workbook template. The workbook is also used to program repetitive tests into the calibrator along with pass/fail tolerances for each data point.

New CALROUTE firmware allows technicians to program repetitive calibration test points and pass/fail tolerances. Once programmed via supplied Microsoft Excel® workbook, technicians can perform calibrations rapidly and receive instant pass/fail feedback. No additional software is needed to program the calibrator or create reports.

SPECIFICATIONS		
<b>Performance</b>		
Frequency Range (operating) <sup>[1]</sup>	5 Hz to 10 kHz	300 to 600k CPM
Maximum Amplitude (50 Hz, 10-gram payload)	20 g pk	196 m/s <sup>2</sup> pk
	20 in/s pk	500 mm/s pk
	150 mils pk-pk	3.8 mm pk-pk
Maximum Amplitude (50 Hz, 500-gram payload)	2.5 g pk	24.5 m/s <sup>2</sup> pk
	3.5 in/s pk	90 mm/s pk
Maximum Payload <sup>[2]</sup>	800 grams	
Test Operation	Manual (Closed Loop) or Semi-Automatic	
Auto-Payload Calculation	Controlled via Reference Accelerometer, No User Entry Required	
Memory	Stores 500 Calibration Records; Stores 30 Data Points Per Calibration Record; Stores Model Number, Serial Number, Mounting Orientation & Notes for each Record; Stores Semi-Automated Test Routine	
Non-Volatile Memory	Up to 30 Test Points per Routine with Pass/Fail Upper & Lower Bound Tolerances	
Programmability	Manual (Closed Loop) or Semi-Automatic	
Accuracy of Readout <sup>[3]</sup>		
Acceleration (10 Hz to 10 kHz)	±3 % <sup>[4]</sup>	
Acceleration (5 Hz to 10 Hz)	±5 % <sup>[4]</sup>	
Velocity (10 Hz to 1000 Hz)	±3 %	
Displacement (30 Hz to 150 Hz)	±3 %	
Accuracy Verification Test	Field Drift Test Procedure Provided <sup>[5]</sup>	
Units of Readout		
Acceleration (pk and RMS)	g	m/s <sup>2</sup>
Velocity (pk and RMS)	in/s	mm/s
Displacement (pk to pk)	mils	µm
Frequency	Hz	CPM
<b>Physical</b>		
Sensor Under Test Sensitivity	mV/EU, mA/EU, µA/EU or pL/EU	
AC Power (for recharging battery)	110–240 VAC, 50–60 Hz	
Operating Battery Life <sup>[6]</sup> : 100 Hz, 1 g pk <sup>[1]</sup>	18 hours	
Sensor Under Test Input	ICP, Voltage, Modulated Current, Charge <sup>[7]</sup>	
Monitor Reference Out	10 mV/g (nominal) Quartz Reference Accelerometer, BNC Jack Output	
USB Port	Export Calibration Records to Flash Drive (FAT 32), Used for Loading Semi-Automated Test Routines (Model CALROUTE) & provides power for external power supplies	
Dimensions (H x W x D)	8.5 x 12 x 10 in	22 x 30.5 x 28 cm
Weight	18 lb	8.2 kg
Sensor Mounting Platform	¼-28 Thread Size	
Export File Format	CSV (comma-separated values)	

SPECIFICATIONS (continued)		
Operating Temperature	32 °F–122 °F	0 °C–50 °C
<b>Supplied Accessories <sup>[8]</sup></b>		
<b>081B20</b>	¼-28 to ¼-28 Adaptor	
<b>081A08</b>	10-32 to ¼-28 Adaptor	
<b>M081A63</b>	M8 x 1.25 M to ¼-28 M Mounting Stud	
<b>PVC-MNT01</b>	M8 x 1.25 F Thru Hole Mounting Pad	
<b>081M165</b>	M8 x 1 M to ¼-28 M Mounting Stud	
<b>PVC-MNT02</b>	M8 x 1 F Thru Hole Mounting Pad	
<b>PVC-HTMNT01</b>	Mounting Plate, 3- & 4-Hole High-Temp Vibration Sensors <sup>[10]</sup>	
<b>PVC-HTMNT02</b>	Mounting Plate, 3- & 4-Hole High-Temp Vibration Sensors <sup>[10]</sup>	
<b>9100-CAL01</b>	NIST Traceable Certificate of Calibration, Accredited to ISO 17025 by A2LA	
<b>9110-USB</b>	USB Flash Memory Drive: Loaded with Calibration Report Generation Workbook	
<b>Calibration Report Generation Workbook</b>	<b>Certificate Generated Via 9110D Memory:</b> Frequency Response & Linearity for AC Voltage Output Transducers <b>Certificate Generated Via User-Input:</b> Vibration analyzer/meter linearity & frequency response accuracy, linearity for 4-20 mA vibration transmitters, proximity probe curves (gap vs. DC voltage)	
<b>Quickstart Guide</b>	Available in English, Chinese, French, Japanese, Polish, Russian, & German	
<b>Warranty</b>	2 Years, Inclusive of Drift/Accuracy	
<b>Tech Support</b>	Training Webinars Available Upon Request, 24/7 Video Library	
<b>Optional Accessories <sup>[8]</sup></b>		
<b>9100-PPASH</b>	Proximity probe adaptor kit for testing probes mounted inside a probe holder	
<b>9155-MNT93</b>	½-20 F to ¼-28 F Mounting	
<b>9155-MNT43</b>	¼" NPT F Mounting Adaptor to ¼-28 M	
<b>9100-PPA01</b>	Proximity probe adaptor kit for probes with 5 mm or 8 mm tip diameter <sup>[9]</sup>	
<b>9100-HTCHRGKIT</b>	High-temp charge mode accel calibration accessory kit	

Meets API 670 requirements for all required test points in acceleration or velocity from 10 Hz to 1000 Hz & payloads to 800 grams.

- [1] 100-gram payload
- [2] Operating range reduced at higher payloads. Reference manual for full details.
- [3] Measured with 10-gram quartz reference accelerometer
- [4] Calculated by measuring the % difference between the known sensitivity of a reference accelerometer as calibrated by laser primary system per ISO 16063-11 and the measured sensitivity of same reference accelerometer when tested at the same points
- [5] Test is conducted independently of product firmware with calibrated voltmeter
- [6] As shipped from factory in new condition
- [7] External Charge Amplifier Required
- [8] For a comprehensive list of available accessories, see Product Spec Sheet or call
- [9] For metric unit micrometers, use Model 9100-MPPA01
- [10] Mounting plates support sensors listed. Multi-hole mounting plates are convenient but not optimized for the best calibration results. The Modal Shop offers a full line of customized mounting pads validated in our calibration lab for precise results. Contact us for more information.

**B&K:** 8324  
**Bently Nevada:** 330450, 330750, 350900  
**CEC:** 4-123, 4-125, 4-126, 4-128, 4-130, 4-137, 4-138, 4-170, 4-171  
**Dytran:** 3085C and 3235 series  
**Endevco:** 6233C, 6222M, 6222S, and 6240 Series

**Metrix:** 5485C, SA6350  
**PCB Piezotronics:** 357 & EX600B series, EX615A42 and EX619A11  
**Vibro-Meter:** CA 134, CE 134, CA 202, CA 280, CE 281, CA 303, CA 306, CE 311

## THE MODAL SHOP

AN MTS COMPANY

10310 Aerohub Boulevard, Cincinnati, OH 45215 USA

Toll-Free in the USA: 800 860 4867

Phone: 1 513 351 9919 | Email: info@modalshop.com

The Modal Shop, Inc. offers structural vibration and acoustic sensing systems and services for various applications in design and test laboratories as well as manufacturing plants. An extensive sound and vibration rental program, precision calibration systems, and both modal and vibration shakers are designed to simplify test phases. Non Destructive Testing Systems help manufacturers provide 100% quality inspection of metal components. The Modal Shop, Inc. is a subsidiary of PCB Piezotronics, Inc., and PCB® is a wholly owned subsidiary of MTS Systems Corporation.

© 2020 The Modal Shop, Inc. In the interest of constant product improvement, specifications are subject to change without notice. PCB®, ICP®, Swiveler®, Modally Tuned®, and IMI® with associated logo are registered trademarks of PCB Piezotronics, Inc. in the United States. ICP® is a registered trademark of PCB Piezotronics Europe GmbH in Germany and other countries. UHT-12™ is a trademark of PCB Piezotronics, Inc. SensorLine™ is a service mark of PCB Piezotronics, Inc. SWIFT™ is a registered trademark of MTS Systems Corporation in the United States. All other trademarks are property of their respective owners.

DS-0103 revF



MTS Sensors, a division of MTS Systems Corporation (NASDAQ: MTSC), vastly expanded its range of products and solutions after MTS acquired PCB Piezotronics, Inc. in July, 2016. PCB Piezotronics, Inc. is a wholly owned subsidiary of MTS Systems Corp.; IMI Sensors and Larson Davis are divisions of PCB Piezotronics, Inc.; Accumetrics, Inc. and The Modal Shop, Inc. are subsidiaries of PCB Piezotronics, Inc.