



MODEL C9110D-T

## CHARGE MODE ACCELEROMETER PORTABLE CALIBRATOR

- Create Calibration Certificates for Vibration Instrumentation
  - ICP® (IEPE) Accelerometers
  - Charge Mode Transducers
  - Piezoresistive Accelerometers
  - Variable Capacitance Sensors
  - Modulated Current (CVLD) Transducers
- Mobile, Lightweight Design with Long Battery Life
- Stepped Sine Tests with Pass/Fail Notification After Each Point
- Popular Mounting Accessories Included
- Open Programming via SCPI Commands
  - Optional PC Software for Full Automation
- Measures Bias Voltage of ICP® (IEPE) Accelerometers

### TYPICAL APPLICATIONS

- On-Site Calibration of Vibration Instrumentation
- Troubleshooting Vibration Test Beds
- In-situ Testing & Confirmation of Accelerometer Sensitivity

### ON-SITE ACCELEROMETER SENSITIVITY MEASUREMENT & CALIBRATION REPORTS

Optimized for vibration transducers found in research & development, automotive, aerospace, and general testing applications model C9110D-T Portable Vibration Calibrator is a traceable calibration system in a mobile package. The powerful shaker supports calibration of ICP® (IEPE), piezoelectric charge, piezoresistive (PR), modulated current (CVLD) and variable capacitance accelerometers over a broadband frequency range from 5 Hz to 10 kHz.

Model C9110D-T is a turnkey calibration solution, supplied with mounting adapters necessary to support the most common test & measurement sensors on the market. The device creates accelerometer calibration reports traceable to NIST and PTB per the ISO 16063-21 standard. Reports are fully customizable and compliant to ISO 17025. A built-in sensitivity display assists with on-site troubleshooting of vibration test beds and data acquisition.

CALROUTE firmware allows engineers to program calibration routines with pass/fail tolerances for both frequency response and linearity. The shaker provides feedback to technicians after each test point. Model C9110D-T supports programming calibration tolerances – including asymmetric bounds – per ISO 16063-21 or simply hard limits.

Programming and data exchange is done on any computer with Microsoft Excel®. As an option, The Modal Shop offers calibration software that supports automated accelerometer calibration and data basing, utilizing the shaker and reference accelerometer within the C9110D-T.



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	
Pass/Fail Notification	After Each Test Point (CALROUTE Mode)	
Auto-Payload Calculation	Controlled via Reference Accelerometer, No User Entry Required	
Memory	Stores 500 Calibration Records; 30 Data Points Per Record; Model Number, Serial Number, Mounting Orientation & Notes; Semi-Automated Test Routine	
Programmability	Up to 30 Test Points per Routine with Pass/Fail Upper & Lower Bound Tolerances. Flexible Pass/Fail Based Upon Deviation from Sensitivity at Reference Frequency or Hard Values and Supports Asymmetric Tolerances.	
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>		
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
Operating Temperature	32 °F–122 °F	0 °C–50 °C
Sensor Mounting Platform	¼-28 Thread Size	
Battery Life <sup>[6]</sup> - 100 Hz, 1 g pk <sup>[1]</sup>	18 Hours	
Battery Life <sup>[6]</sup> - 100 Hz, 10 g pk <sup>[1]</sup>	1 Hour	
Sensor Under Test Sensitivity	mV/EU, mA/EU, µA/EU or pC/EU	
Sensor Under Test Input	ICP, Voltage, Modulated Current, Charge, PR	
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	

SPECIFICATIONS (continued)	
<b>Supplied Accessories</b>	
081B20	¼-28 to ¼-28 Adaptor
081A08	10-32 to ¼-28 Adaptor
9100-CAL01	NIST Traceable Certificate of Calibration, Accredited to ISO 17025 by A2LA
9110-USB	USB Flash Memory Drive: Loaded with Calibration Report Generation Workbook
9155-MNT05	5-40 F to ¼-28 M Mounting Pad
9155-MNT06	10-32 F to ¼-28 M Mounting Pad
9155-MNT07	Adhesive Mounting Plate to ¼-28 M
Calibration Report Generation Workbook	<b>Certificates Generated Via 9110D Memory:</b> Frequency Response & Linearity for AC Voltage & Current Output Transducers <b>Certificates 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)
Warranty	2 Years, Inclusive of Drift/Accuracy
<b>Optional Accessories</b>	
080A90	Loctite 454 - Quick bond Gel (for use with accelerometer adhesive mounting bases to fill gaps on rough surfaces)
081A27	Mounting stud, 5-40 to 5-40 threads, without shoulder, BeCu
9100-MNTKIT	Mounting accessory kit for 9100 Series Portable Vibration Calibrators, to adapt to 1/4-28 threaded mounting platforms. Includes studs/inserts (1/4-28, 10-32, 6-32 and 5-40) and bases (for adhesive, magnetic and custom thread patterns).
9100-MPPA01	Proximity probe adaptor kit, supports 5mm and 8mm size probes. Includes brackets for securing probes with 6mm, 8mm, 10mm, 1/4 inch and 3/8 inch diameter case threads. Includes Mitutoyo micrometer scaled in microns and 4140 steel target.
9100-PPA01	Proximity probe adaptor kit, supports 5mm and 8mm size probes. Includes brackets for securing probes with 1/4 inch, 3/8 inch, 6mm, 8mm and 10mm diameter case threads. Includes Mitutoyo micrometer scaled in mils and 4140 steel target.
9100-PR	Piezoresistive accelerometer calibration option for Portable Vibration Calibrators. Includes Endeveco 4418 bridge signal conditioner, connection cable to push terminals and mounting plate.
9155-MNT01	Calibration System Mounting Adaptor. For Sensors with triangular hole patterns on a 1.20" diameter circle. Uses an 8-32 mounting thread. Includes 3 mounting screws.
9155-MNT02	Calibration System Mounting Adaptor, for sensors with triangular hole patterns on a 1.00" diameter circle. Uses a 4-40 mounting thread. Includes mounting screws.
9155-MNT03	Calibration System Mounting Adaptor, for sensors with square hole patterns on a 1.375" diameter circle. Uses a 6-32 mounting thread. Includes mounting screws.
9155-MNT08	Calibration System Mounting Adaptor. For Sensors with 6-32 through hole mounting. Includes mounting screws.
9155-MNT19	Calibration System Mounting Adaptor. For sensors with a triangular hole pattern on a 1.190" (30.2 mm) diameter circle. Uses an M4 mounting thread. Includes 3 mounting screws.
9155-MNT32	Thread adaptor, 10-32 internal thd x 1/4-28 external thd, BeCu
9155-MNT38	Thread adaptor, 6-32 internal thd x 1/4-28 external thd, SS

[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