



**The Modal Shop, A PCB Group Co.
Calibration Workstation
Pressure Options**

Selection

Range			Turnkey Calibration Workstation	Upgrade of Existing PCB Product to Turnkey System	Upgrade of 9155D
psi	MPa	bar			
150	1	10.3	K9903C	K9903C01	9155D-903
1,000	6.8	68.9	K9907C	K9907C01	9155D-907
15,000	103	1034	K9913C	K9913C01	9155D-913
100,000	689	6895	K9905C	K9905C01	9155D-905

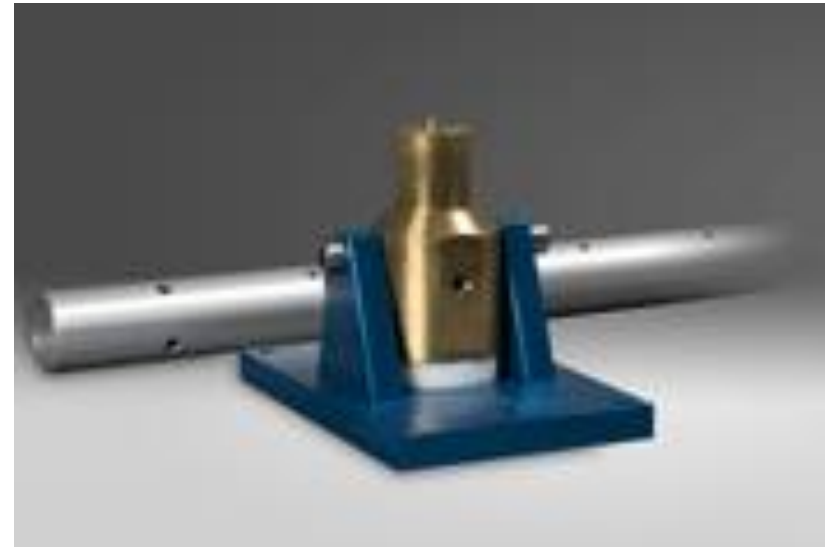
- **Max Pressure = 10 bar**
- **'Step' Input**
- **Pneumatic Media**
- **3 to 5 ms rise time**
- **±1.5% Typical Measurement Uncertainty**



- Max Pressure = 69 bar
- 'Step' Input
- Helium Gas
- 30 to 50 μ sec rise time
- $\pm 1.5\%$ Typical Measurement Uncertainty



- Max Pressure = 1034 bar
- Impulse (Hammer) Input
- Silicon Oil Media
- Dropped Masses
- $\pm 4.1\%$ Typical Measurement Uncertainty

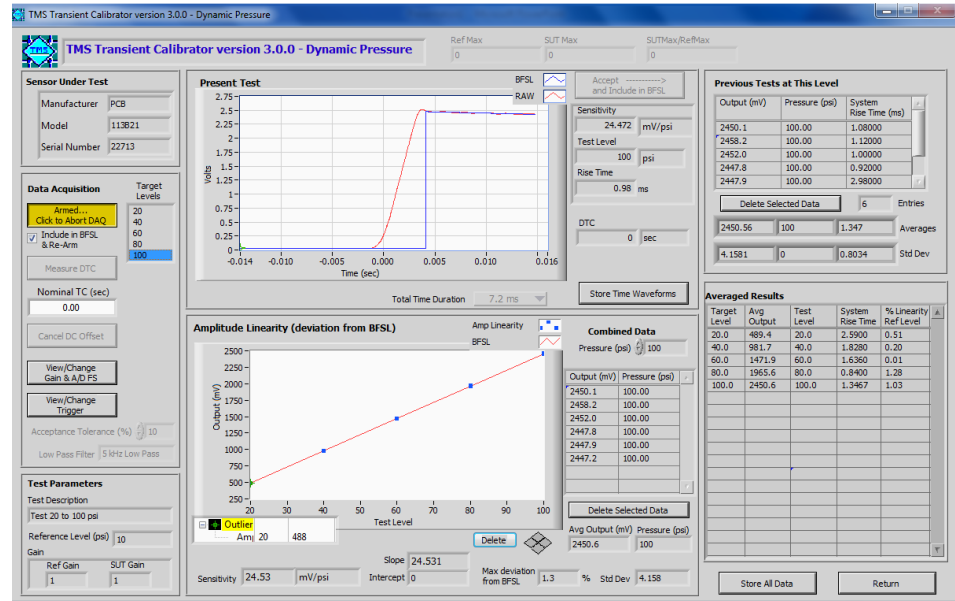


- **Max Pressure = 6905 bar**
- **'Brass' Calibration**
 - Quasi-Static Input
 - Ballistics
 - 117B Series Conformal Sensors Only
 - $\pm 2.0\%$ Typical Measurement Uncertainty



Pressure Calibration Software

- Derived from field proven, mature shock option
- Interactive editing
- Visual BFSL display
- Auto accept
- Level selection



'Step' Data Acquisition Software (K9903C, K9907C)

TMS Transient Calibrator version 3.2.0 - Dynamic Pressure

Sensor Under Test
 Manufacturer: PCB
 Model: SY112A22
 Serial Number: 26742

Data Acquisition
 Pressure: 153.865
 Target Levels: 137.895, 206.843, 344.738
 Include in BFSL & Re-Arm
 Measure DTC
 Nominal TC (sec): 0.00
 Cancel DC Offset
 View/Change Gain & A/D FS
 View/Change Trigger
 Acceptance Tolerance (%): 10
 Low Pass Filter: 5 kHz Low Pass

Present Test
 Ref Max: 0, SUT Max: 2.22544, SUTMax/RefMax: 0
 BFSL: Accept and Include in BFSL
 RAW:
 Sensitivity: 14.705 mV/kPa
 Test Level: 151.344 kPa
 Rise Time: 2.86 ms
 DTC: 0 sec
 Total Time Duration: 28.8 ms
 Store Time Waveforms

Previous Tests at This Level

Output (mV)	Pressure (kPa)	System Rise Time (ms)
2094.9	146.43	2.7200
2153.0	148.45	2.8600
2192.3	149.70	2.8400
2214.7	150.64	2.7400
2225.4	151.34	2.8600

Delete Selected Data: 7 Entries
 Averages: 2154.178, 147.863, 2.74
 Std Dev: 59.7839, 2.9771, 0.1536

Amplitude Linearity (deviation from BFSL)
 Amp Linearity: BFSL
 Combined Data: Pressure (kPa) 137.895
 Output (mV) Pressure (kPa)
 2094.9 146.43
 2153.0 148.45
 2192.3 149.70
 2214.7 150.64
 2225.4 151.34
 Delete Selected Data
 Avg Output (mV) Pressure (kPa)
 2154.2 147.86
 Slope: 14.6, Nominal Linearity: 1%, Intercept: 0, Max deviation from BFSL: 2.3%, Std Dev: 59.78

Test Parameters
 Test Description: Test 137.895 to 344.738 kPa
 Reference Level (kPa): 50
 Gain: Ref Gain 1, SUT Gain 1

Averaged Results

Target Level	Avg Output	Test Level	System Rise Time	% Linearity Ref Level
137.9	2154.2	147.9	2.7400	0.53
206.8	3124.0	212.9	2.6633	2.32
344.7	4948.6	339.7	2.3767	1.20

Store All Data, Return

Impulse Data Acquisition Software (K9913C)

TMS Transient Calibrator version 3.2.0 - Dynamic Pressure

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Ref Max: 0 SUT Max: 2.22544 SUTMax/RefMax: 0

Sensor Under Test

Manufacturer: PCB
Model: SY112A22
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Accept and Include in BFSL

Sensitivity: 14.705 mV/kPa
Test Level: 151.344 kPa
Rise Time: 2.86 ms
DTC: 0 sec

Store Time Waveforms

Previous Tests at This Level

Output (mV)	Pressure (kPa)	System Rise Time (ms)
2094.9	146.43	2.7200
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Delete Selected Data: 7 Entries

Averages: 2154.178, 147.863, 2.74

Std Dev: 59.7839, 2.9771, 0.1536

Data Acquisition

Pressure: 153.865
Target Levels: 137.895, 206.843, 344.738

Armed... Click to Abort DAQ

Include in BFSL & Re-Arm

Measure DTC

Nominal TC (sec): 0.00

Cancel DC Offset

View/Change Gain & A/D FS

View/Change Trigger

Acceptance Tolerance (%): 10

Low Pass Filter: 5 kHz Low Pass

Amplitude Linearity (deviation from BFSL)

Amp Linearity: BFSL

Combined Data: Pressure (kPa) 137.895

Output (mV)	Pressure (kPa)
2094.9	146.43
2153.0	148.45
2192.3	149.70
2214.7	150.64
2225.4	151.34

Delete Selected Data

Avg Output (mV): 2154.2 Pressure (kPa): 147.86

Slope: 14.6 Nominal Linearity: 1% Intercept: 0

Sensitivity: 14.6 mV/kPa Max deviation from BFSL: 2.3% Std Dev: 59.78

Averaged Results

Target Level	Avg Output	Test Level	System Rise Time	% Linearity Ref Level
137.9	2154.2	147.9	2.7400	0.53
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344.7	4948.6	339.7	2.3767	1.20

Store All Data Return

Test Parameters

Test Description: Test 137.895 to 344.738 kPa

Reference Level (kPa): 50

Gain: Ref Gain: 1, SUT Gain: 1

9901C Shock Tube

- **7' x 2" Instrumented Shock Tube**



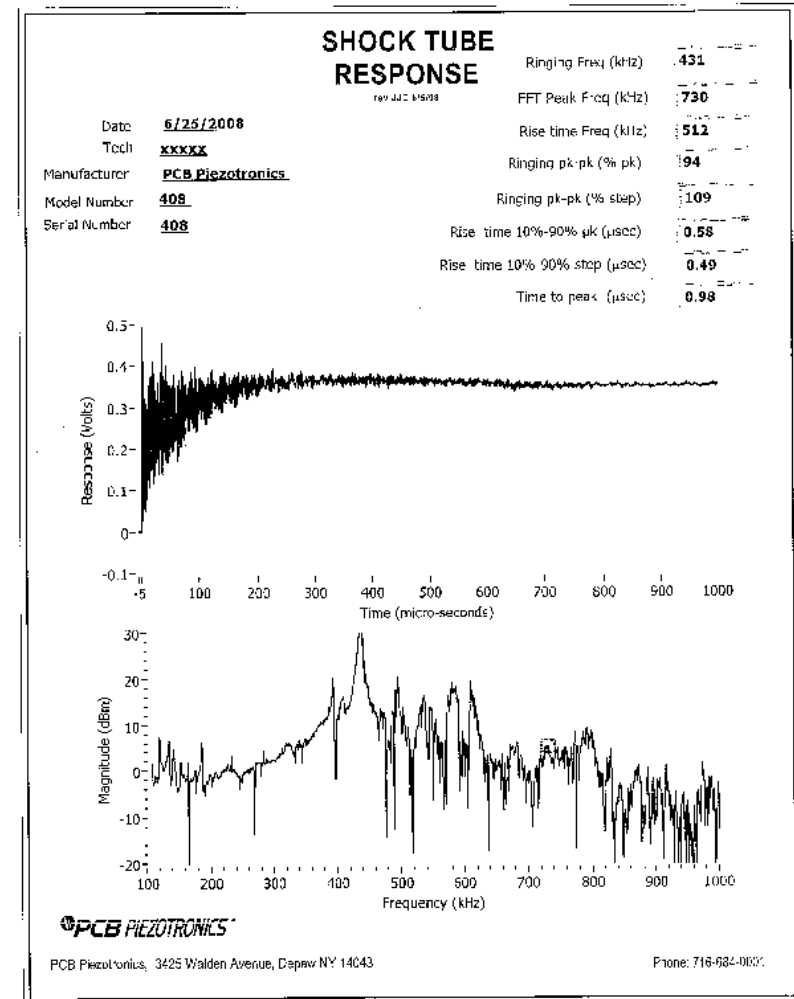
Shock Tube

Tube is used for resonant frequency determination

Tube can be used with variety of gasses Helium, Nitrogen, Air
84" tube, 12" driver, 2" diameter

Shock response spectrum processing is stand-alone application

DAQ triggered by single pressure trigger sensor



Selection and Options

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MPa	bar			
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6.8	68.9	K9907C	K9907C01	9155D-907
103	1034	K9913C	K9913C01	9155D-913
689	6895	K9905C	K9905C01	9155D-905