

sensor & calibration tips



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Greetings,

Welcome to Issue #45

Welcome once again! I've been fortunate to spend the weekend with PCB founder Jim Lally and have been discussing some of the history of dynamic calibration. The technology around accelerometer calibration has been building for almost a century now. Technology with integrated electronics continues to make testing and calibration easier, while innovative references and improved excitation drive uncertainties down. All this adds up to better measurements for you to help improve your products and processes.

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Tip of the Month

When calibrating shock accelerometers, use a high-g actuator to determine accelerometer sensitivity across a large amplitude range in addition to the frequency response calibration measured on an air bearing shaker. This provides a more appropriate sensitivity measured in the expected range of use and validates transducer linearity.

Quick Links

[NCSL](#)

[IMEKO](#)

[PTB](#)

[NIST](#)

[ISO TC 108](#) - Mechanical vibration, shock and condition monitoring

[ISO TC 108/SC 3](#) - Use and calibration of vibration and shock measuring instruments

[SAVIAC](#)

[Vibration Institute](#)

[TMS Video Vault](#)

[Learn More Calibration](#)

We're Continually Adding New Calibration Learning Resource Materials...

We are continuing to strive to bring you high quality learning materials for dynamic calibration and have added a new section to our website. The "[Learn More](#)" tab on the completely redesigned [Calibration home page](#) links to a

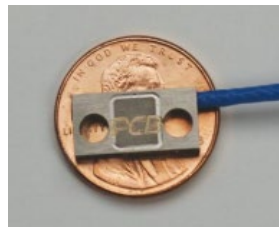


page full of resources for the dynamic calibration professional. Designed to provide information for the novice to the expert, here you'll find links to recent conference papers, some accompanying slide presentations, industry trade journal articles and web links. If you have other ideas of what you would like to see here, please don't hesitate to [contact me](#) and The Modal Shop Team. We will be glad to research and post material of specific interest to you.

[Click here to "Learn More"](#)

http://www.modalshop.com/calibration_learn.asp

How High in Frequency Are Accelerometer Measurements Meaningful?



The following paper was authored by Dr. Patrick Walter, professor at Texas Christian University and consultant to PCB Piezotronics.

Almost all piezoelectric accelerometers in the current market place have a fundamental sensor resonance below 100 kHz. In 1983 Endevco Corporation designed a series of MEMS (Micro Electro-Mechanical Systems) accelerometers. These silicon-based piezoresistive accelerometers enabled sensor resonances of 100s of kHz to above 1 MHz. The original intent of this design (Model 7270) was to create an accelerometer with a

Previous Newsletter

[sensor & cal tips #44](#) -
Sensing Calibration News;
Evolution of Calibration Reference
Accelerometer

[sensor & cal tips #43](#) -
Sensing Calibration News;
Calibrating the Calibration System

Select Newsletter Articles by Topic

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Accelerometers](#)

[Similarities Between Charge and
ICP Operation](#)

[Selecting Accelerometers for
Mechanical Shock](#)

[Master List of Topics \(T.O.C.\)](#)

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resonant frequency high enough that it would not be excited in metal-to-metal impact or explosive environments. These types of environments are generally described by the term pyrotechnic shock (pyroshock). Unfortunately, in spite of the advantage provided by the high resonant frequencies of these accelerometers, the extremely low intrinsic damping of silicon acts as a counterbalance. The result of this low damping is often over-ranging and breakage of the accelerometers when they are subjected to pyroshock. In order to support the development of a series of more robust MEMS accelerometers, this paper answers the question: How high in frequency response are accelerometer measurements meaningful?

[Click here to read more](#)

<http://www.modalshop.com/calibration.asp?ID=587>

Training Courses with Dr. Walter

This week at PCB Piezotronics, Dr. Walter is teaching a sold out course in dynamic shock, vibration, pressure and force measurement theory and practice. Click below for details and more information on upcoming courses.

[Click here for upcoming courses](#)

http://pcb.com/docs/Pat_Walter_August_2011_registration.pdf

Thanks again for joining us this month. We're busy traveling four continents, staffing trade shows ([ESTECH](#), [SAE- Sound & Vibe](#), [ALTA-CCMA](#), [PowderMet](#) and [FEIMAFE](#)) and continuing to develop innovative solutions for your toughest calibration and measurement challenges. Please don't hesitate to contact us if you have any questions...

Sincerely,



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