



Introduction to Building a Sensor-Based Test System with CompactDAQ and LabVIEW

BRETT BURGER
SOLUTION MARKETER





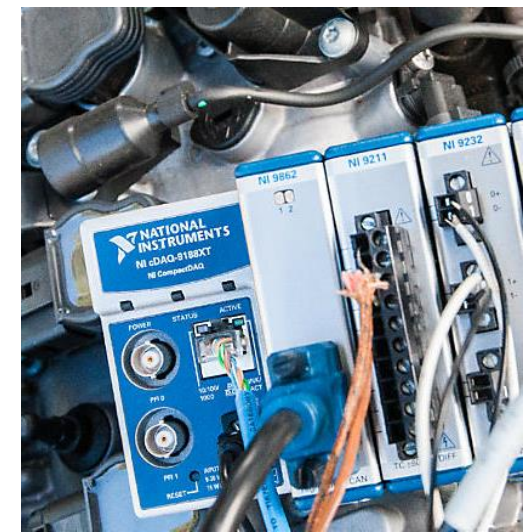
Electromechanical Test

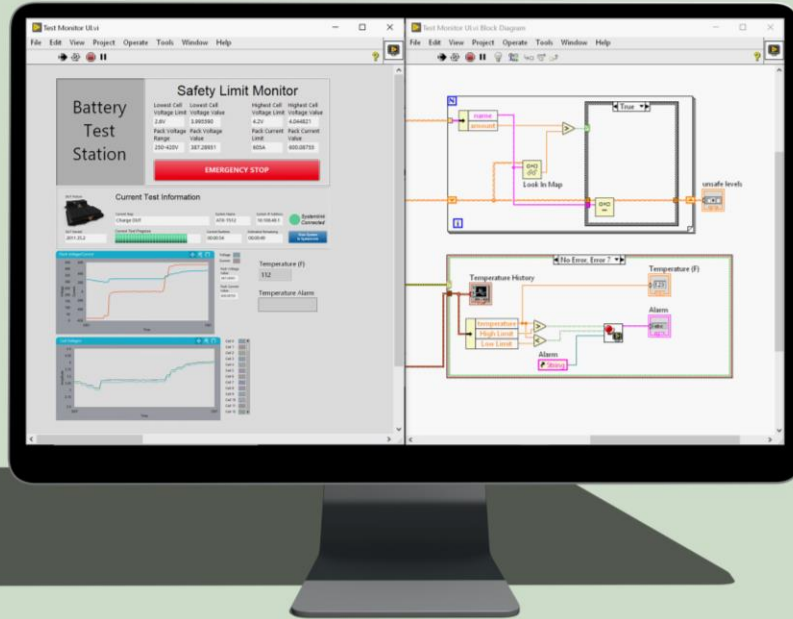
Challenges

Multiple signals – physical sensors and electrical signals

Tests are expensive

Not always in a controlled environment or lab





THE NI APPROACH

NI CompactDAQ

For Electromechanical V&V

Modular hardware with synchronization for a custom signal mix that can manage dynamic measurements

Trusted NI brand quality for confidence in the data and fewer test re-runs

Software options so you can work your way

- LabVIEW
- C#, .NET, Python, MATLAB®



ni

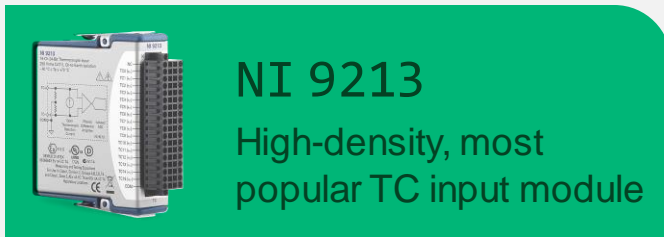


Today's Application



Temperature Measurements with LabVIEW and CompactDAQ

Measurement Modules



NI 9213

High-density, most popular TC input module



NI 9214

High-density like NI 9213, but more accurate



NI 9212

Ch-Ch isolation, miniature TC connection option, best accuracy (screw terminal option)



NI 9219

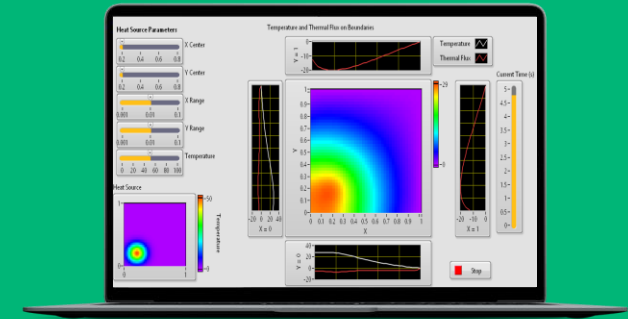
Universal module with Ch-Ch Isolation



NI 9210

Miniature TC input (mini jack), lowest cost

LabVIEW Software Tools



PDE THERMAL DISTRIBUTION.VI EXAMPLE

LabVIEW has Analysis Blocks for:

Interpolation and Extrapolation

Fitting

Probability and Statistics

Power Measurements with LabVIEW and CompactDAQ

Voltage



NI 9242/44

3-phase inputs (L1,L2,L3,N)
for 220/440 VAC networks



NI 9225

300 Vrms, ch-ch isolated

Current



NI 9227

Good accuracy for low current
(5 Arms) measurements
Minimal over-range



NI 9245/46

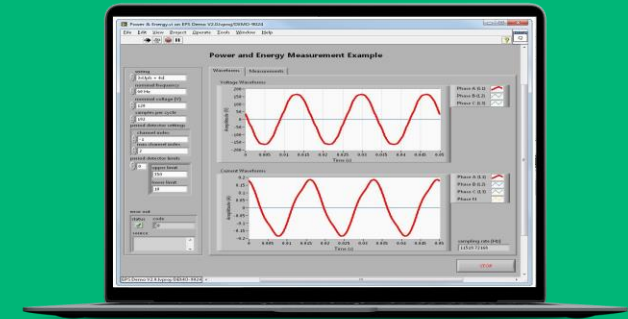
Use for CTs with 5A secondary
outputs and large over-range



NI 9238/29

Use with CTs that have a low-
voltage output (0.333V or 10V)

Software



POWER AND ENERGY MEASUREMENT VI
DEVELOPED USING THE ELECTRICAL POWER SUITE

**Electrical Power Suite
for LabVIEW**

Signal processing palette

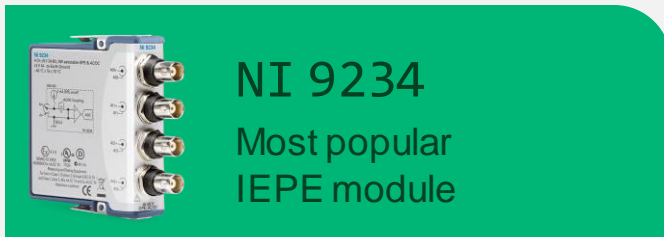
Waveform measurements palette

Dynamic signal filtering



Sound and Vibration Measurements with LabVIEW and CompactDAQ

C Series Measurement Modules



NI 9234
Most popular IEPE module



NI 9250
Designed for NVH applications



NI 9231
High channel-count



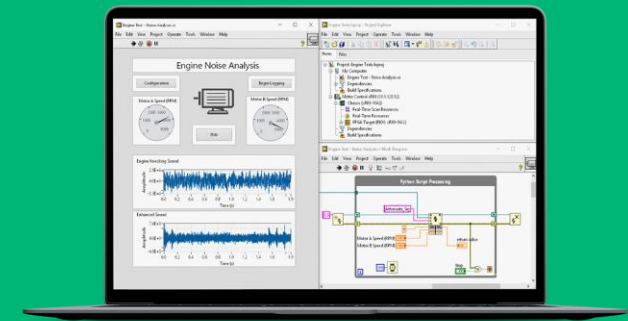
NI 9230
Low-cost version of NI 9232



NI 9232
Designed for turbomachinery

All sound and vibration modules have:
24-bit resolution input circuitry
Built-in excitation for sensors (iepe)
Sample between 12ks/s/ch and 102.4 ks/s/ch

Software



Sound and Vibration Toolkit for LabVIEW

Example Programs

DSA Soft Front Panels



[Download the LabVIEW Eval](#)

[Shop for CompactDAQ Modules](#)

[See the Hardware Used in Studio](#)

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Question & Answers

Please submit your question through the Q/A chat pod.

