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Solution Brochure

Mechanical and Sensor-Based Test



Explore NI's Solutions

Delivering quality products that meet required standards and regulations, on time and on budget, demands innovative and comprehensive validation testing. However, product complexity is increasing, market windows are getting shorter and today's electronic devices need to survive the rigor of daily use. Acquiring data from sensors is a foundational step for validating mechanical components, but physical tests present several challenges such as multiple sensor types, costly setup time, and expensive prototype construction. Good data-logging equipment should minimize the impact of change as you validate different design revisions, components, or entirely new programs. You need quality instrumentation to get data you can trust out of these expensive tests.

Integrate NI's modular data acquisition hardware with data logging software to cover a variety of test types such as:

- Environmental
- Structural
- Shock and Vibration
- Thermal
- Endurance and Cycle
- Fluid Flow Characterization
- Acoustic



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Solution Overview

Preparation is key for mechanical tests because they are costly to repeat. NI's approach to electromechanical testing combines modular hardware with simple, off-the-shelf data-logging software to create a system that takes you from sensor to spreadsheet with no programming, less effort, and less time. Need to change or add sensors? The same software and core hardware components support 100s of sensor modules, so you can build the next test system in less time and without having to invest in a lot of extra equipment.

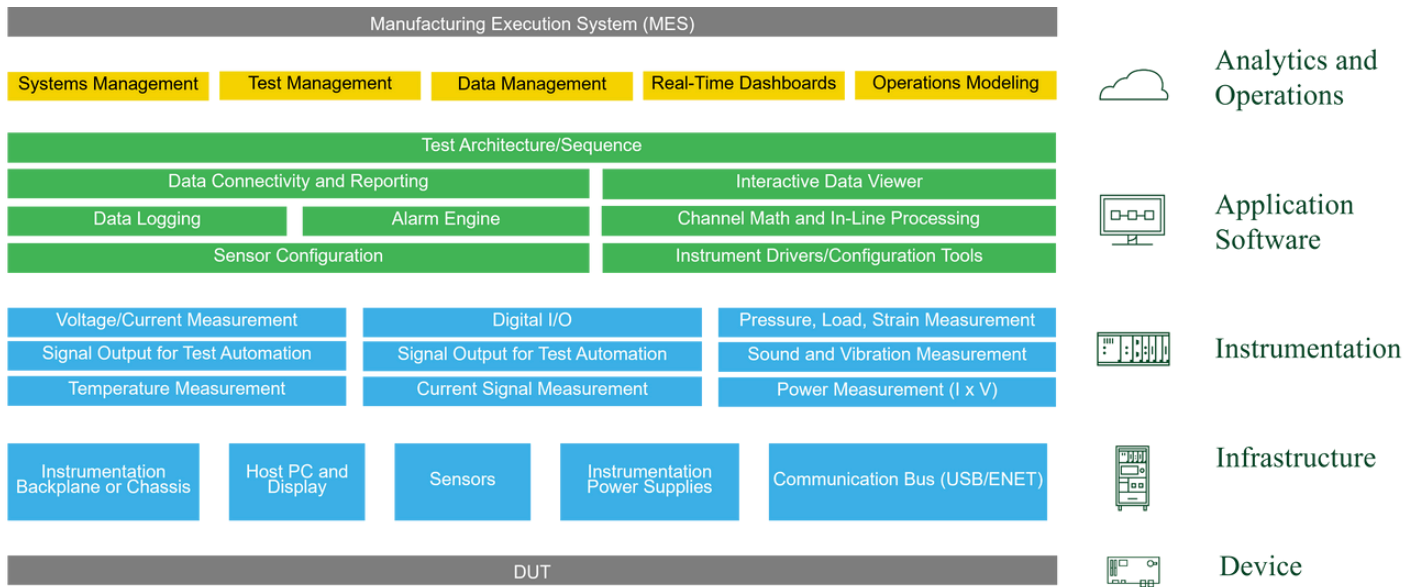


FIGURE 1
Solution Architecture for Electromechanical Component Validation

Important features for reuse, flexibility, and on-time testing include:

- A large selection of sensors and signal I/O with built-in signal conditioning to keep more of the test system on a single vendor platform
- Microsecond hardware synchronization and communication through a single cable for simplified setup
- Distribute large-channel-count systems by daisy-chaining multiple chassis
- Configuration-based data-logging software to reduce time to the first measurement, configuring alarms, trigger, and file formats
- An open solution for re-use of existing IP and greater flexibility
- An interactive review of test results for visual inspection and analysis

This solution architecture enables validation engineers to modernize their laboratory with quicker measurements, reduced lab footprint, native synchronization, and a consistent experience from software interface to data-capturing and data-sharing. Modern Lab approaches enable reproducible & scalable automation, more test coverage, and increased collaboration across teams re-using code IP across different groups to speed up time-to-first-measurement.

NI Solution

Customizable data acquisition systems to verify and validate components and design durability using measurement hardware and configuration-based data-logging software. The key elements of the NI solution for mechanical and sensor-based test are:

- Quality measurement hardware for data confidence and test repeatability
- Rugged mechanical design with convenient sensor connectivity options
- Modular components to customize the data acquisition system to the test plan
- Software tools that minimize configuration, setup, and automation efforts
- Data formats compatible with popular analysis and reporting tools, including Excel, DIAdem, and MathWorks MATLAB® software

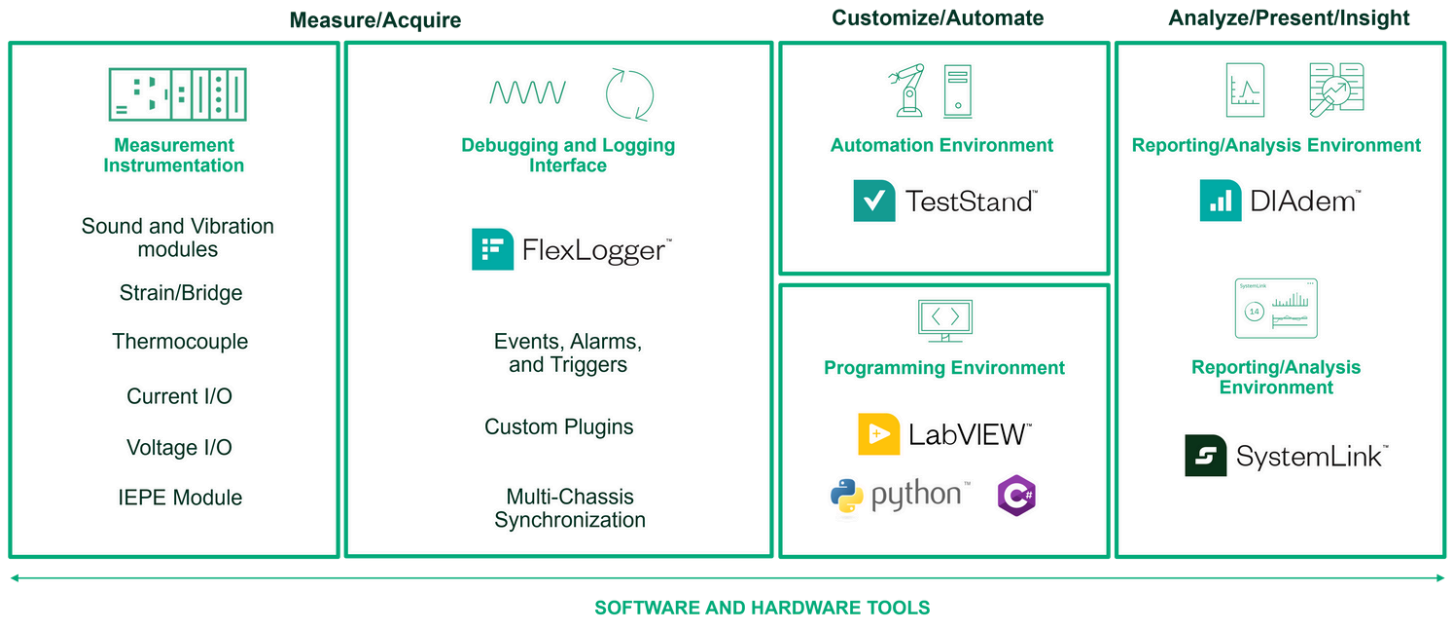


FIGURE 2
NI Solution for Mechanical and Sensor-Based Test

Combine CompactDAQ systems with FlexLogger to manage multiple mechanical component validation tests for an expandable analog and digital data acquisition system. Customize your acquisition with additional measurements and control logic using LabVIEW, and quickly create complex test sequences and generate reports with TestStand. In addition, use DIAdem to search, visualize, analyze, and report on logged data, and extend engineering insight with an integrated, scalable, enterprise solution like SystemLink.

More information about each of these components is available in the [Software](#) section of this brochure.

Key Features

Flexible to Meet Changing Requirements

<p>SOFTWARE</p>  <p>Software for test engineers for faster development and more collaborative work</p>	<p>PERFORMANCE</p>  <p>Speed Synchronization Bandwidth</p>	<p>QUALITY</p>  <p>Reliable design/build so things work as expected</p>	<p>FUTURE PROOF</p>  <p>Modular systems to expand/adjust hardware measurements</p>
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Hardware Platform for Sensor-Based Test

Simplify Setup and Focus on Design Validation with CompactDAQ

CompactDAQ helps you deliver test systems fast, spending more time on actual design validation with features that reduce setup effort such as:

- Rugged design for installation close to the device under test to reduce sensor wire lengths
- Synchronization over Ethernet to simplify deploying networked systems
- USB and Ethernet chassis options in a variety of sizes to scale as your project grows
- Over 70 sensors and I/O modules available so you can get the measurements you need from one vendor

A CompactDAQ system can be as simple as a 1-slot USB chassis with a single module connected to a laptop running FlexLogger configuration-based software, or it can be multiple distributed Ethernet chassis with synchronized measurement channels connected to a custom test application that integrates control, analysis, and measurement code from multiple development languages and third-party instrumentation.

1 Driver and Application Software

Easier test setup and software configuration. Program a more robust test system with software support for the language of your choice (LabVIEW, Python, C/C#, .NET, MATLAB).

2 Chassis

Choose your communication bus, number of slots, and environmental operating ranges. Connect modules to a PC using USB or Ethernet communication and synchronize measurement channels through built-in timing circuitry.

3 Modules

C Series modules are measurement-specific modules with front-end circuitry, analog conversion technology, and signal connectivity designed to create the best digital representation of a signal as possible.



Key Features

Flexible to Meet Changing Requirements

To help meet your unique needs, NI products range from plug-and-play DAQ devices for fixed and repeatable measurements, to scalable and flexible modular DAQ systems.

ACCURATE



Maximize the absolute accuracy of your measurements

FLEXIBLE



Build mixed-measurement systems tailored to your needs

SCALABLE



Choose hardware options to control multiple data acquisition systems

PROGRAMMABLE



Program your hardware using the same API in the language you choose

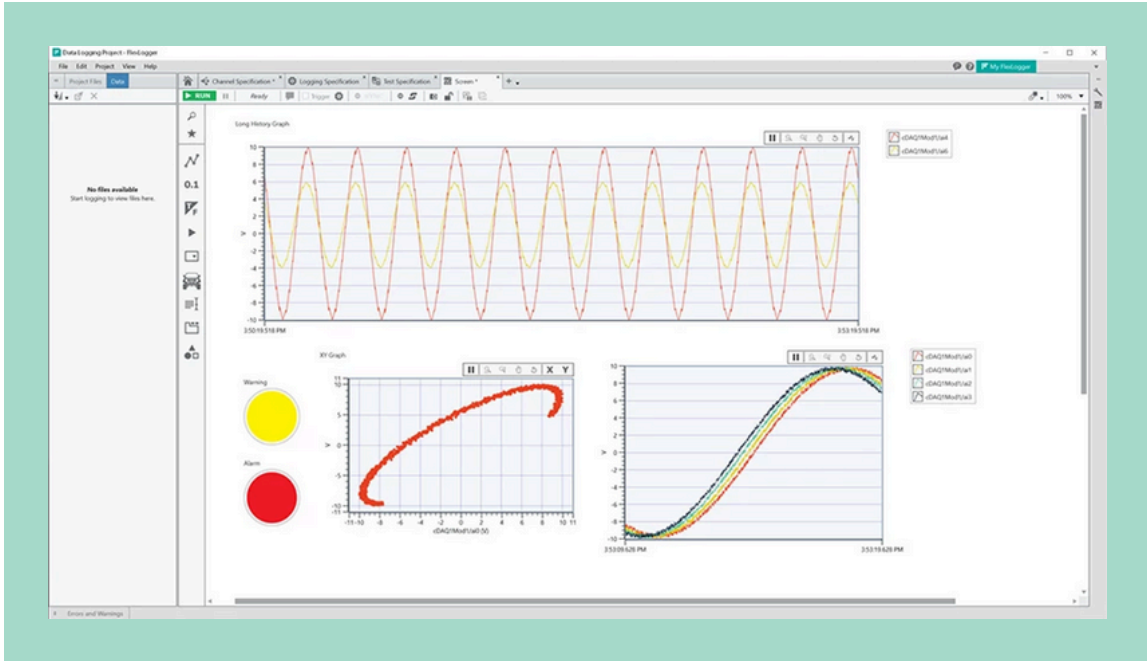
C Series I/O for Smaller, Rugged, Distributed Systems

Signal Type	Channel Count per Module	Measurement Types	Max Sample Rate	Special Features
Analog Input				
Voltage	Up to 32	Options for ± 200 mV, ± 500 mV, ± 1 V, ± 5 V, ± 10 V, ± 60 V, 3 Vrms, 400 Vrms, 800 Vrms, 300 Vrms	20 MS/s/ch	Up to channel-channel isolation, anti-aliasing, and configurable filtering
Current	Up to 16	Options for ± 20 mA, 0 – 5 Arms, 0–20 Arms, 0–50 Arms	200 kS/s	Up to channel-channel isolation, built-in channel diagnostics
Voltage and Current	16	Options for ± 20 mA and ± 10 V	500 S/s	Channel-earth isolation, built-in noise rejection
Universal	Up to 4	V, mA, TC, RTD, Strain, Ω , IEPE	51.2 kS/s/ch	Up to channel-channel isolation, bridge completion, anti-aliasing filters, built-in shunt resistors, amplification
Thermocouple	Up to 16	J, K, T, E, N, B, R, and S types	95 S/s/ch	Up to channel-channel isolation, amplification, filtering, CJC
RTD	Up to 8	100 Ω , 1000 Ω	400 S/s	50/60 Hz filtering, bank isolation
Strain/ Bridge Based	Up to 8	$\frac{1}{4}$, $\frac{1}{2}$, full bridge (120 or 350 Ω)	50 kS/s/ch	External excitation, bridge completion, anti-aliasing filters
Sound and Vibration	Up to 8	± 5 V, ± 30 V	102.4 kS/s/ch	IEPE, anti-aliasing filters
Analog Output				
Voltage	Up to 16	Options for 3 Vrms, ± 10 V, ± 40 V (stacked)	1 MS/s/ch	Up to bank isolation
Current	Up to 8	± 20 mA	100 kS/s/ch	Channel-earth isolation, built-in open-loop detection
Digital I/O				
Input/Output	Up to 32	Options for TTL (3.3 V or 5 V) RS422, 5 V, 12 V, 24 V, 48 V, 72 V, 96 V, 120 V AC, 120 V DC, 240 V AC, 240 V DC	55 ns	Up to channel-channel isolation, sinking or sourcing input, bidirectional channel options
Relay Output	Up to 8	Options for 60 V DC, 30 Vrms, 250 Vrm	1 op/s	Up to channel-channel isolation, SPST, or SSR relays
Communication Buses				
CAN	1	HS/FD, LS/FT CAN	1 Mb/s	—
LIN	1	LIN	20 kb/s	—
Serial Interface	4 ports	RS232, RS485/RS422	921.6 kb/s	—

Data-Logging Application Software and More

Get Data Your Way and Minimize Change with FlexLogger™

NI FlexLogger data-logging application software is designed to get data from sensor to an open data format without programming. Export to .csv file format for ASCII text that is compatible with any software tool (such as Excel) off the shelf. For higher-speed waveform acquisition (common to sound and vibration or power measurements) use a .tdms file format to optimize stream-to-disk performance. The tdms format is an open binary file format so you can import and parse the data using programs written in LabVIEW, MATLAB®, .NET, or Python.



Troubleshoot Physical Systems and Characterize Component Performance

FlexLogger helps you set up and view measurements faster with intuitive sensor-specific configurations, customizable screens, and interactive data review.

QUICKLY CONFIGURE MEASUREMENTS

With FlexLogger, you can automatically detect CompactDAQ hardware and quickly configure mixed measurements. This means less time setting up software and more time viewing data for key insights

RUN YOUR TEST WITH CONFIDENCE

While testing, you can create screens with indicators and alarms in FlexLogger to let you know the test is running correctly. Include hardware settings, sensor serial numbers, and more in your log file as metadata

GET INSIGHT FROM YOUR TEST

With the data viewer, you can view data from multiple channels and sources including CAN, easily synchronize and display all data for playback, and export your data to multiple file formats

ANALYZE AND COMMUNICATE

NI recommends using DIAdem with FlexLogger to quickly locate, inspect, and analyze data using included analysis libraries or custom formulas. Ensure consistent and well-documented reports.

“FlexLogger is easy to use for real-time data logging. It helps me reduce output time/money to create a datalogging system because you don't have to have a degree to know what's going on.”

Branden Maese, NASA

Do More with the NI LabVIEW+ Suite

The LabVIEW+ Suite is built for professional electromechanical tests and provides software solutions to reduce development time, increase data usage, and prevent rework.

Develop Automated Validation with LabVIEW

A graphical programming language and environment engineers use to develop automated research, validation, and production test systems.

Create Professional User Interfaces

View data and control your test system via an interactive UI built from drag-and-drop UI elements

Integrate All Your Instruments

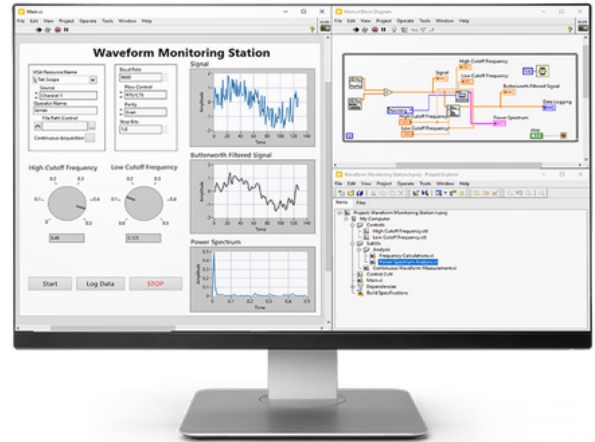
Acquire data from and control any instrument with 1000s of device drivers and industry-standard protocols

Program Like You Think

Save development time by creating and visualizing applications using data flow programming

Use Other Code

Leverage other and existing code written in Python, C/C++, MATLAB®, and .NET



Build Complex Test Sequences with TestStand

A test executive software that accelerates system development and deployment for engineers in validation and production.

Automate Your System

Create, execute, and debug test sequences using an interactive environment

Leverage Existing Code

Use code from LabVIEW, Python, C/C++, or .NET

Test More, Faster

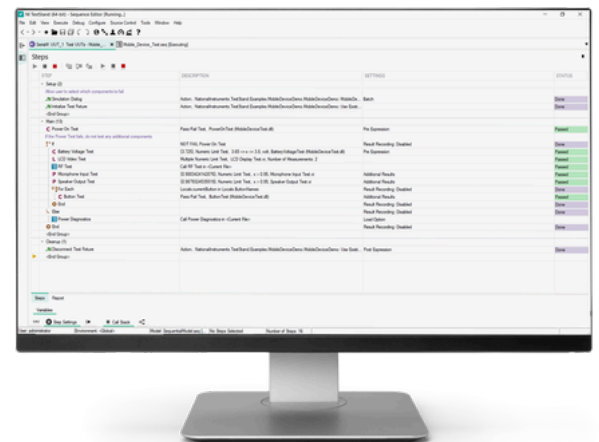
Use native parallel execution to reduce test time and functionality for advanced tasks such as sweeping and looping

Keep Track of Results

Track units, automatically generate reports, and store results to local or network databases

Deploy To Your Testers

Scale your operations by deploying sequences to numerous test stations with custom or pre-built operator interfaces



“Using NI Testand and LabVIEW, we successfully converted a lengthy manual test process into a highly automated test cycle and reduced the regression test cycle from weeks to days, while increasing reliability, repeatability, and maintainability”

Sambit Panigrahi, Texas Instruments

Automate Your Measurement Data Analysis with DIAdem

Data analytics software for measurement data search, inspection, analysis, and automated reporting.

Data Search and Inspection

Access data and search through metadata in local or network locations

Visualization

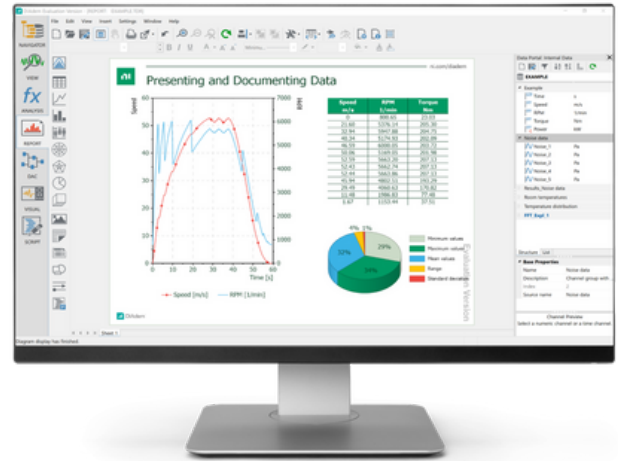
Display data in multiple 2D-axis systems, play video data, and more

Advanced Analysis

Utilize hundreds of built-in advanced analysis functions in addition to custom reusable formulas

Automated Reporting

Automate your measurement data analysis workflow from import to analysis to report



“We have reduced our reporting and analysis time by 95percent and achieved our goal of replacing the current multistep process with a one-button DIAdem solution”

Jim Knuff, Raytheon

Improve Time-to-Insight of Test and Measurement with SystemLink™ Software

SystemLink™ software provides a central infrastructure of asset management, lab orchestration, and data management and analysis tools to plan, execute, and deliver results from test and measurement activities more efficiently.

Asset, System, and Lab Orchestration

Simplify the tracking, configuration, and scheduling of test and measurement hardware to maximize test throughput and reduce costs

Data Management and Analysis

Connect output to a centralized, scalable data pipeline for faster collection, analysis, and reporting of test and measurement data and insights

MAXIMUM TEST THROUGHPUT AND EFFICIENCY



By maintaining a digital record of test and measurement hardware and activities, various analysis techniques can identify test improvements and inform capital expenditures.

AUTOMATED DATA PIPELINE



With the appropriate data mapping and setup, test and measurement output can easily be reviewed, stored, and processed at predefined checkpoints for faster extraction of insights

LOCAL AND GLOBAL STANDARDIZATION



Scalable deployment models allow the benefits of SystemLink to be realized with consistent workflows at the bench, lab, and enterprise level.

Environmental Test

Designed to Test and Validate Under Specified Environmental Conditions



Test Needs

- Test and certify local and worldwide regulations for equipment under specified environmental conditions, such as HVAC components, biological items, industrial products, materials, and electronic devices and components
- Limited physical testing because of DUT size or prototype expense
- Acquire and log synchronized data from multiple sensor types
- Shorten testing time to get to market quickly

Energy, Cost, and Time Savings

Environmental testing simulates the different climatic conditions and mechanical stress that products are exposed to during their lifetime.

For example, the test engineers can receive a control board for an industrial machine and need to test it for heat, cold, humidity, and pressure. Additionally, they need to log hours of data from sensors in the chamber, then do some basic analysis and compile it with graphs of the data into a report that goes to the engineering team and is saved for compliance records.

To reduce test and development costs, companies need to automate their test facility and limit test chamber use. These systems require significant levels of automation, high-accuracy control, and high-channel-count data acquisition capabilities to monitor I/O, log data, and provide robust, reliable functionality.

NI Solution

- **FlexLogger™** application software for data logging manages sensor configuration, real-time data visualization, export to .csv files, and channel alarms, all without programming
- **LabVIEW™** programming environment to automatically control, monitor, and report all aspects of unit testing
- **cDAQ-9174** chassis with several C Series modules and connects to a PC or laptop over USB. (Ethernet chassis are available)

The NI Advantage

- **QUALITY** - Have confidence in your test data with hardware designed by a brand known for quality with over 40 years of experience
- **SIMPLICITY** - Setup your test with turnkey data logging software that automatically detects hardware and manages test procedures and certification protocols
- **FLEXIBILITY** - Modular hardware and open data formats help you get any measurement you need into any analysis software you want to use now, or in the future.

"Using NI products, we successfully designed and developed a highly accurate, reliable system that helped our client efficiently study the behavior of its HVAC units while saving energy, time, and capital."

Chris Hudson, ProMetric Systems, Inc.

Structural Test

New Technologies for Structural Testing and Health Monitoring



Test Needs

- Minimizing the risk of lost data and measurement failures during structural testing
- Gathering enough information about the device under test to validate device models
- Safety, maintainability, and livability of the world's civil infrastructure

NI Solution

- **FlexLogger™** data-logging software manages all measurement channels and aggregates data from all sensors in a single project
- **SystemLink™** data management software makes structural measurement data available to test engineers and analysts
- **CompactDAQ** hardware includes the NI-9235 and NI-9236 C Series Strain/Bridge Input Modules for the best measurement specifications per channel cost on the market

Robust, Precision and Signal Conditioning

Sensor technology is one of the most active areas of research and technological advancement in structural testing and monitoring. Structural testing systems integrate a wide variety of sensors to track the stresses or movements of bridges, buildings, stadiums, and other large structures.

StructuralX is the structural health monitoring solution from NI partner IRS, based on the rugged, accurate, and reliable **NI data acquisition platform** and **SystemLink software**. This solution consists of:

- 25 CompactDAQ chassis
- Monoaxial and 3-axis accelerometers
- Strain gage, deformation, displacement sensors
- Temperature, inclinometer, 3D anemometer
- 2 weather stations, fog sensor, GPS synchronization

The NI Advantage

- **PRECISION** - C Series modules combine connectivity, signal conditioning, and A/D conversion for direct connection to structural sensors
- **CONNECTIVITY** - Remotely access and manipulate test data, even during the test process, while managing structural measurement assets and data
- **MODULARITY** - **NI data acquisition platforms** offer a breadth of measurements covering a variety of sensors and signals

Performing Static Test

Static testing is a critical part of many types of validation tests. In some industries like Aerospace, there is extensive continuous static testing to prove their products will survive the stresses of flight before deployment.

For more information on the complete system design and installation instructions, visit ni.com.

Vibration and Harshness Test Solution

Validate Designs for Shock and Vibration



Test Needs

- Rigidly mount the test DUT to a shaker table
- Connect accelerometers to the DUT and shaker table
- Provide excitation to power IEPE accelerometers
- Acquire data at a rate that meets test-frequency requirements

NI Solution

- **FlexLogger™** application software for data logging manages sensor configuration, real-time data visualization, export to .csv files, and channel alarms, all without programming
- **cDAQ-9174** chassis with C Series modules connects to a PC or laptop over USB. (Ethernet chassis are available)
- **NI-9234** sound and vibration input modules for input channels that sample at 51.2 kS/s/ch

Expandable High-Speed Data Acquisition

Mechanical engineers validate designs using shock and vibration tests because, in the real world, products get dropped and it's good to know which components pop off of a PCB first. Whether it's testing a custom vibration sensor or an antivibration feature, shaking a device under test (DUT) in a controlled manner requires large, expensive test fixtures and precision measurements.

NI Partner Wintek, an expert in noise and vibration testing, offers dynamic control for multi-axis vibration benches designed to simulate road profiles for testing traction and agricultural machinery. The solution, based on LabVIEW and CompactDAQ systems, meets static and dynamic I/O needs, acquires signals from the field, and reproduces the desired time-varying vibration profiles.

The NI Advantage

- **RUGGED & SMALL SIZE** - Suitable for laboratories or test stations with limited space
- **EASY TO USE** - Configuration-based data acquisition, easy setting for sensors, alarm conditions, and UI
- **SCALABILITY** - Open system for adding high-speed input channels and different measurement types
- **FLEXIBLE & EFFICIENT** - Quick system development, accelerate the time to market

“FlexLogger software makes it easier to troubleshoot and verify that the raw data from different sensors are correct before I start my test. This helps shorten test development by saving time typically wasted on redoing configurations.”

Andy Tarman, CNH Industrial

Thermal Test

Validate Electronic Designs with Temperature Measurements



Test Needs

- Connect thermocouples at points of interest across an electronic design
- Route all the thermocouple wires and any power and communication wires for the device under test (DUT) through the temperature chamber port plug
- Configure the thermocouples in a data acquisition system, monitor and log results of the thermal test

NI Solution

- **FlexLogger™** application software for data logging manages sensor configuration, real-time data visualization, export to .csv files, and channel alarms, all without programming
- **cDAQ-9174** chassis holds up to four C Series modules and connects to a PC or laptop over USB
- **NI-9213** 16-channel C Series temperature input module for thermocouple types J, K, T, E, N, B, R, and S

Manage Change with Flexibility

Thermal testing examines the response of a material to temperature fluctuations, offering valuable insights into its potential performance across diverse environments and conditions. Such testing is indispensable for essential product assessments, including quality assurance, testing, and analysis.

Flexibility is key if you want to manage design updates and customer requests with a single test system. CompactDAQ hardware and FlexLogger configuration-based software get you the temperature data you need for a quality product and on-time delivery. **NI Partner IRS** with extensive experience in white goods, offers a solution to measure and visualize up to 900 thermocouples in real time to verify cooking appliance normative compliance over standards.

The NI Advantage

- **PORTABLE** - Rugged system that's easy to position near thermal chamber ports
- **EASY TO USE** - Configuration-based software for sensor setup, real-time trend display, and setting alarm conditions
- **OPEN** - Optional power measurement modules for power at temperature tests and data formats compatible with Microsoft Excel, Python, NI DIAdem, and MathWorks MATLAB® software

“With this solution, we found a ready-to-use library of heating tests on household appliances. We saved 30% of testing and reporting time.”

White goods manufacturer

Endurance and Cycle Test

Validate Product Quality with HALT/HASS Test



Test Needs

- Identify either high or low-quality components enabling a higher-quality product
- Increase the product's robustness and longevity
- Speed up the design and testing phase of your product
- Reduce failures in the field or to consumer

Successfully Integrating Test and Measurement

HALT (Highly Accelerated Life Testing) is a test technique that typically uses temperature and vibration step-stressing. HASS is the production equivalent of HALT. This test can duplicate in a few hours what takes months or years to happen in the field environment. Other stresses such as humidity, dust, and power cycling are also used.

In the white goods market, it is fundamental to perform tests as required by regulatory compliance. [NI Partner IRS](#) provides solutions for white goods to measure and collect data from the household in real-time and analyze the data during the test. This test bench manages the electrical safety and performance of appliances: power consumption, voltage, current, temperature rise, and cooling tests for refrigerators, or spin speed and water consumption for washing machines.

NI Solution

- [FlexLogger™](#) application software for data logging manages sensor configuration, real-time data visualization, export to .csv files, and channel alarms, all without programming
- [CompactDAQ](#) chassis with C Series modules connects to a PC or laptop over USB (Ethernet chassis are available)
- [LabVIEW](#) graphical programming language to integrate all your instruments and develop automated validation test systems

The NI Advantage

- **HIGH QUALITY & RELIABILITY** - Automated and standardized test solution for consistent and rigorous product testing
- **INTEGRATION** - [NI data acquisition platforms](#) streamline the test process and help you gain valuable insights
- **EFFICIENCY** - Reduce costs associated with manual testing and aftermarket repairs. Get new products to market faster while maintaining high standards

“The software connected ecosystem of NI and the partnership with IRS, provide us the most productive test workflow on the market”

Gianluca Tassotti, Electrolux

Fluid Flow Characterization Test

Validate Performance and Durability of Fluid Flow Devices



Test Needs

- Shorten test development time on new devices
- Acquire mixed measurements from multiple sensors and I/O types to determine temperature, flow rates, pressure, humidity, strain, head levels, etc
- Accommodate changing test conditions such as adjusting the input state, modifying environmental surroundings, and adding new sensors
- Use software you don't have to program to acquire, log, and analyze large amounts of data

Manage Change with Flexibility

Characterizing the performance and durability of all your fluid flow devices (pumps, valves, fans, compressors, pressure tanks, etc) is critical to gaining insights into your assets and monitoring their system health. These devices are customized for use in various industries and applications, so their test requirements are unique. This increases the amount of time you need to modify your test setup to cover your diverse test needs, which makes it harder for you to deliver on schedule.

4FLOW is a test system from **NI partner EN4** that ensures highly accurate and reliable measurement of flow rate and flow coefficients over extended periods. The characterization of components such as throttle bodies, engine heads, manifolds, exhaust, valves, or pipes is performed using highly accurate measuring devices.

NI Solution

- **FlexLogger™** application software for data logging manages sensor configuration, real-time data visualization, export to .csv files, and channel alarms, all without programming
- **cDAQ-9174** chassis holds up to four C Series modules and connects to a PC or laptop over USB
- **DIAdem™** application software to process, visualize, and streamline root-cause determination to find the answers to the most complex test problems

The NI Advantage

- **EASY TO USE** - Out-of-the-box starting point for quick data logging and analysis
- **ACCURACY** - The system ensures high measuring accuracy, consistent during decades on the fields
- **ADAPTABILITY** - The system automatically regulates the flow rate and/or pressure and adjusts them to desired conditions
- **CALIBRATION** - The system is calibrated for precise and traceable measurements.

“With EN4 and NI, we have been able to monitor the development of all our components from a fluidic perspective and compare the quality of the results obtained in different plants around the world.”

Leader in automotive market

Audio and Acoustic Test

Sound Quality Engineering



Test Needs

- Vibroacoustic emissions are a privileged index of perceived quality
- Different types of devices have different thresholds for acceptable amounts of acoustic noise.
- Accommodate changing test conditions, observing all aspects relating to the functioning and performances
- Compliance to standards

NI Solution

- [LabVIEW™](#) application software for data logging manages sensor configuration, real-time data visualization, export to .csv files, and channel alarms, all without programming
- [cDAQ-9185](#) Ethernet chassis holds up to four C Series modules and is designed for distributed sensor measurement systems
- [NI-9234](#) sound and vibration input modules for input channels that sample at 51.2 kS/s/ch

Measuring Sound Power

In the white goods market, to improve quality and user experience, engineers must reduce vibration and noise in household appliances like air conditioners, fridges, and washing machines. Complex and diverse scenarios require portable and miniaturized instruments and a sharp learning curve for software development.

The Noise Vibration Analyzer system by [NI Partner Wintek](#) was developed to measure sound power emission in controlled environments (anechoic/semi-anechoic and reverberant chamber) as prescribed by the standards (ISO 3741/3744/3746) based on CompactDAQ systems. This is a versatile and multifunctional tool and can be used both as a real-time acquisition and analysis and monitoring system and as a tool for classical post-processing analysis in time and frequency domain.

The NI Advantage

- **SIMPLE TO USE** - HMI software interface to evaluate all the phases of the process and continuously check vibroacoustic parameters
- **QUALITY** - Best-in-Class Hardware for Simultaneous Vibration and Functional Parameter Measurement. [NI data acquisition platforms](#) allow you to capture and measure a continuous process
- **DEEP ANALYSIS** - Automatic calculation of acoustic performance, spectral distance analysis, and signal recording functions

With the NI data acquisition platform and Wintek's experience, we could perform audio and acoustical testing, measure acoustic emissions, and reduce manufacturing costs.

A big company in white goods market



System Integration on Your Terms

NI offers a variety of solution integration options customized to your application-specific requirements. You can use your own internal integration teams for full system control or leverage the expertise of our worldwide network of NI Partners to obtain a turnkey system.

Contact your account manager or call or email us to learn more about how NI can help you increase product quality and accelerate test timelines at (888) 280-7645 or info@ni.com

NI Services and Support



Consulting and Integration



Global Support



Turnkey Solution Delivery and Support



Prototyping and Feasibility Analysis



Repair and Calibration



Training and Certification

NI Hardware Services

All NI hardware includes a one-year warranty for basic repair coverage and calibration in adherence to NI specifications prior to shipment. PXI systems also include basic assembly and a functional test. NI offers additional entitlements to improve uptime and lower maintenance costs with service programs for hardware. Learn more at ni.com/services/hardware.

	Hardware	Standard	Premium	Description
Duration at Point of Sale	1 year; included	3 years; optional	3 years; optional	NI enhances warranty coverage with additional service benefits provided with a hardware service program.
Maximum Duration with Renewal	≤3 years with service program	≤3 years	≤3 years	NI maintains the high performance and availability of your hardware for up to three years with a hardware service program.
Extended Repair Coverage	•	•	•	NI restores your device's functionality and includes firmware updates and factory calibration; < 10 working days ⁴ + standard shipping.
System Configuration, Assembly, and Test ¹		•	•	NI technicians assemble, install software in, and test your system per your custom configuration prior to shipment.
Advanced Replacement ²			•	NI stocks replacement hardware that can be shipped immediately if a repair is needed.
System Return Material Authorization (RMA) ¹			•	NI accepts the delivery of fully assembled systems when performing repair services.
Technical Support	•	•	•	NI provides access to support resources for your hardware.
Calibration Plan (Optional)		Standard	Expedited ³	NI performs the requested level of calibration at the specified calibration interval for the duration of the service program.

¹ This option is only available for PXI, CompactRIO, and CompactDAQ systems.

² This option is not available for all products in all countries. Contact your local NI sales engineer to confirm availability.

³ Expedited calibration is only available for the Traceable calibration level.

⁴ This applies to non-RF products only. Standard extended repair coverage for RF products is <15 working days + standard shipping.

PremiumPlus Service Program

NI can customize the offerings listed above or offer additional entitlements such as on-site calibration, custom sparring, and lifecycle services through a [PremiumPlus Service Program](#). Contact your NI sales representative to learn more.

Technical Support

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