

LMS Test.Lab Introduction



LMS Test.Lab

The integrated solution for noise and vibration testing

LMS Test.Lab is a complete, integrated solution for test-based engineering, combining high-speed multi-channel data acquisition with a full suite of integrated testing, analysis and report-generation tools. LMS Test.Lab is designed to make testing more efficient and more convenient for each and every user. It is the ideal tool for testing departments that need to be future-focused: offering the right balance between ease of use and functional flexibility. LMS Test.Lab significantly increases a test facility's productivity, delivering more reliable results, even when the availability of prototypes is dramatically reduced.

A complete portfolio for noise and vibration testing

LMS Test.Lab offers a complete portfolio for noise and vibration testing, including solutions for acoustic, rotating machinery, and structural testing, environmental testing, vibration control, reporting and data management. With its unified interface and seamless data-sharing capability between different applications, LMS Test.Lab offers users tremendous efficiency gains with the added benefit of real ease-of-use. In addition, the LMS Test.Lab solution can handle standard, repetitive tests as well as more advanced troubleshooting in one single software and hardware package. This guarantees maximum scalability and optimal investment protection.

Built-in productivity

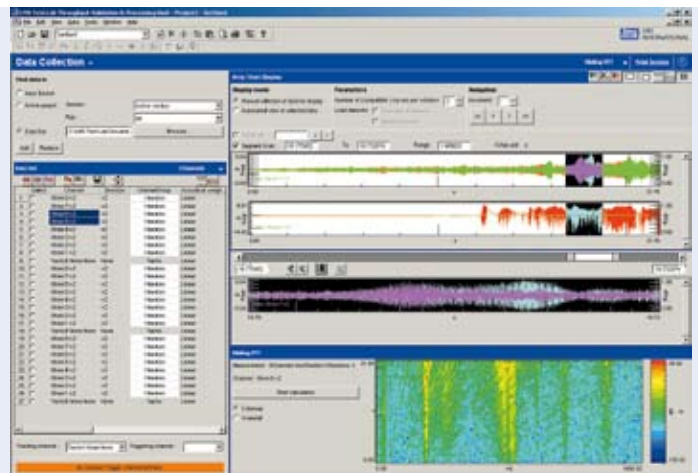
With its unique workflow-based interface, LMS Test.Lab sets new standards for ease-of-use, productivity and data consistency. The software naturally follows the test campaign process, guiding the user through the different steps and suggesting optimal settings for measurement and analysis parameters. Engineers really appreciate LMS Test.Lab's streamlined integration with the LMS SCADAS data acquisition product family. With one single hardware and software platform, they can cover all laboratory and in-field tests as well as recorder-based testing jobs. Embedded analysis during data acquisition speeds up the testing process and guarantees the right data right from the start. LMS Test.Lab permits on-the-spot test result validation against targets and traces the root cause of a problem directly to the source – making sure that the testing time is used in the best possible manner.

Right to the source of noise and vibration issues

With LMS Test.Lab, there is no beating around the bush with trial-and-error troubleshooting. LMS Test.Lab guides users directly to the source of the problem using comprehensive, integrated analysis capabilities and LMS' unique source-transmitter-receiver methodology. Users of all levels can trace the fundamental cause of a problem and solve it effectively, cost-efficiently and quickly. In short, it is a measurement and analysis tool that makes an engineer's life easier

Adapted to the changing world of testing

Virtual models have no value unless they accurately represent real life. This requires high-quality modeling techniques and accurate load data. By testing existing components and benchmarking competitive products for target setting purposes, LMS Test.Lab is extensively used to front-load data into the simulation process. It provides loading information and feedback to update virtual models, and is systematically used to provide test-derived component and sub-assembly models that are too complex to model virtually from scratch. Easy to integrate into LMS Virtual.Lab and LMS Imagine.Lab as well as other simulation packages, LMS Test.Lab provides the critical support to making virtual simulation efficient and realistic.





LMS Test.Lab: the complete portfolio for noise and vibration testing

- An integrated one-platform, scalable suite for noise and vibration testing
- Solutions for rotating machinery, structural and acoustic testing, environmental testing, vibration control, reporting and data management
- A workflow-based user interface delivers optimal ease-of-use and productivity
- Combining quick visualization, powerful analyses and easy reporting
- From standard qualification testing to advanced troubleshooting and engineering in a single solution
- Complete integration with the LMS SCADAS data acquisition hardware family for mobile, recorder and lab testing
- Protect your investment with future-ready technology and techniques

LMS Test.Lab

Covering a wide range of industry applications



Aerospace engineering

Aerospace manufacturers are faced with the challenge of designing systems and components that have to be safer, more reliable, lighter, cheaper to operate, deliver better passenger comfort and have less environmental impact than their competitors. On the spatial side, manufacturers must design larger and more complex satellites at a faster rate while guaranteeing that the payload can withstand extreme launch and operation conditions. Although virtual prototype simulation has dramatically accelerated the development processes, only testing can fulfill the final sign-off and provide the feedback to validate assumptions and calibrate virtual models.

LMS Test.Lab offers dedicated aerospace solutions:

- Ground Vibration Testing (GVT) to ensure the structural integrity of the aircraft or spacecraft and other critical components
- Operational modal analysis to assess the behavior of aerospace structures during operational conditions
- Dynamic testing and qualification of jet engines
- Large-scale modal survey testing for qualification and acceptance testing on spacecrafts, satellites and instruments



Automotive Engineering

The biggest issue at the moment on the minds of NVH testing experts in the automotive industry is best summarized as productivity and efficiency. Despite the increased use of virtual simulation, test departments are actually faced with an increased volume of testing work they need to complete. The explosion of product variants and increased testing scenario complexity largely compensates for the routine testing tasks eliminated by simulation. In addition, automotive companies are continuing to shorten their product development cycle times, resulting in fewer prototypes and therefore - less time for testing. LMS Test.Lab has been designed to meet these challenges and offers a complete set of tools and applications for automotive NVH engineering:

- Engine noise and vibration testing
- Torsional vibration measurements
- Gear whine and rattle testing
- Break squeal testing
- Driveline sensitivity testing
- Noise source identification
- Sound power testing
- Acoustic intensity mapping
- Noise source ranking
- Interior noise assessment
- Sound quality
- Pass-by noise testing
- Acoustic material testing
- Transfer path analysis
- Operational deflection shapes
- Modal testing and analysis
- Operational modal testing and analysis
- Component vibration qualification testing



Heavy machinery

In the face of unrelenting global market pressures, heavy machinery companies must deliver innovative products that outperform the competition and meet or exceed customer expectations. LMS has developed a scalable portfolio of solutions that help all types of companies in all types of industries create true competitive advantages - in their specific markets. This might include controlling resonant vibrations of high-speed complex machinery to ensure consistent production quality, maximum fatigue resistance and minimum radiated noise productivity without compromising operator safety. Or it might be assisting with regulation safety and environmental compliance for new machine designs. Whether it's a tight development schedule or tough quality or safety standards causing an issue, LMS Test.Lab offers tried-and-true testing solutions for all types of manufacturing industries.



Wind energy and power generation

To certify a new wind turbine, manufacturers must ensure full system reliability under real-life operating conditions. Durability must be assessed to provide a 20-year lifetime with low operation and maintenance costs. Noise emissions must remain within prescribed tolerances. On top of that, the control system must guarantee clean voltage at constant frequency. LMS has worked extensively with wind turbine manufacturers and suppliers to help design top-class products. For wind turbine manufacturers, LMS Test.Lab offers a complete solution to measure and optimize the vibration and noise emitted by the gearbox, generator and blades. LMS Test.Lab is used to identify propagation of noise and vibrations throughout the complex structure and find optimal solutions for noise radiation and excessive vibrations.

Besides wind energy, LMS expert solutions are used in other power generation sectors such as load identification and foundation analyses for power plants; noise and vibration studies for gas turbines and pipelines as well as research and development and on-site troubleshooting.



Off-road, construction and agricultural vehicles

Off-highway manufacturers must continuously increase operation performance and optimize the operating limitations of their products. Giant mining trucks must run faster and carry the maximum load capacity for maximum efficiency. Excavator manufacturers constantly improve the reach and agility of their products, while maintaining optimal safety and stability. And agricultural tractors and machines are designed for ever-tougher operating conditions, increasing environmental standards and more demand for product customization without forgetting comfort. Driver comfort, which includes reducing interior noise levels and vibrations mostly in extreme conditions, is becoming a distinctive brand differentiator and one that is increasingly being dictated by regulations and industry norms. LMS Test.Lab has been adopted by many off-highway manufacturers to cover these specific noise and vibration issues.



Consumer and business electronics

Manufacturers of white goods, home and office appliances face extremely short development cycles, an increasing number of design variants and ever-higher customer expectations. Minimal noise levels are critical success factors for many commercial products like dishwashers, washing machines, PCs and even copiers. Other consumer electronic brands such as loudspeakers, home cinema systems and mobile phones differentiate via the quality of their acoustic performance. And the increased complexity of sophisticated electronic control units that interact with mechanical parts makes it challenging to guarantee a safe and high-quality operation throughout the product's lifetime. LMS Test.Lab helps all types of manufacturers pro-actively meet these stringent requirements when completing brand new product designs.

LMS Test.Lab

A complete portfolio of testing solutions

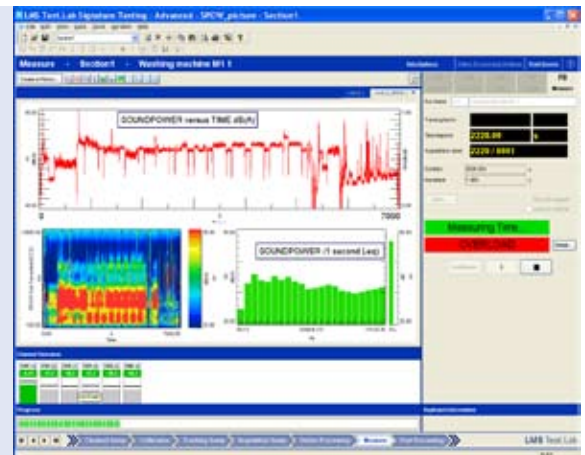
LMS Test.Lab Desktop

The LMS Test.Lab Desktop is not just the launch platform of all other LMS Test.Lab applications; it is an essential application for everyone in the organization – management, engineers, and technicians - who need to access your work, process data, and make reports themselves. Distributed test preparation and post-processing frees up the expensive test cell and shows the process-centric LMS Test.Lab approach.



LMS Test.Lab Acoustics

LMS provides the acoustic engineer with a powerful set of highly integrated tools. From the signal conditioning of microphones and interfacing with digital heads to the acquisition of sound power levels, real-time octaves, and the latest high-tech tools for sound quality engineering, LMS Test.Lab Acoustics conforms to the latest international standards and engineering practices.



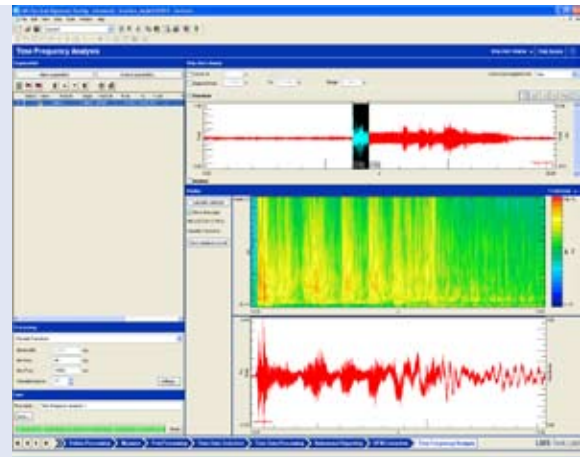
LMS Test.Lab Structures

Structural testing used to be a long and complex process. No longer. With LMS Test.Lab Structures, technicians can perform large-scale modal surveys in less than a day. LMS is renowned for its modal testing experience - from impact testing of small structures to campaigns using many shakers and hundreds of measurement channels. LMS Test.Lab carries on and extends that tradition while LMS Test.Lab PolyMAX provides a state-of-the-art modal parameter estimator and expert-like automatic modal pole selection (AMPS) - a combination that results in superbly fast and user-independent results.



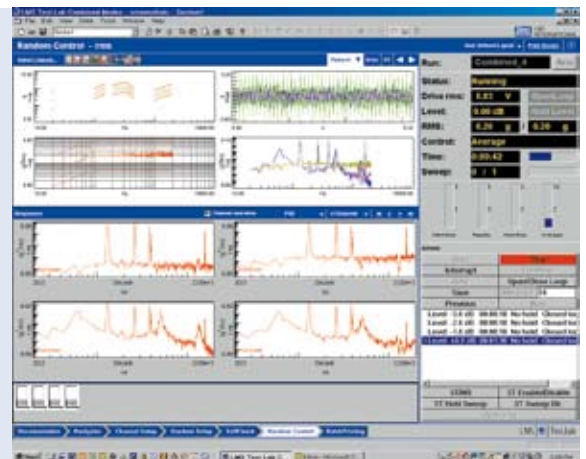
LMS Test.Lab Rotating Machinery

Troubleshooting and product refinement demand a comprehensive array of tools: waterfall mappings to globally characterize the problem; order tracking for an in-depth investigation; time data to experience the sound; a complete set of processing functions, including angle domain processing based on data sampled at fixed angles; specialized modules to help assimilate and visualize the vast amounts of data that are generated. Whether you are measuring on an engine dyno, in a vehicle on the proving ground or in the field near a large turbine, LMS Test.Lab is always the perfect choice.



LMS Test.Lab Transfer Path Analysis

LMS Test.Lab is packed with enhanced features that promise to help every test department save time and resources. With the broadest portfolio of Transfer Path Analysis solutions on the market, LMS can help customers tackle issues from every possible angle - from simple systems with a single soft-mounted source to complex structures with multiple and variable mounted sources.



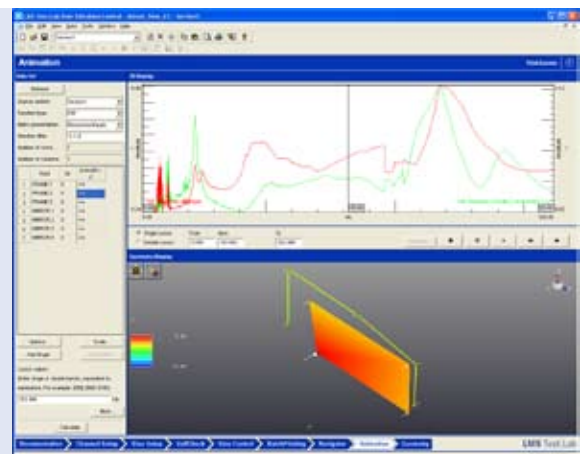
LMS Test.Lab Vibration Control

LMS Test.Lab Vibration Control is an entry-level vibration control solution with high-end performance. It combines optimal ease of use with the performance and reliability of an advanced system. The system offers accurate closed-loop shaker control and a maximum of built-in safety mechanisms, which minimize the risks of damaging costly test items. User guidance and secure automation capabilities deliver maximum productivity and enable testing teams to meet critical deadlines.



LMS Test.Lab Environmental

LMS Test.Lab brings you the most advanced and complete range of environmental testing solutions on the market - a powerful, high-speed multi-channel vibration control system to measure, monitor and control pre-launch vibration tests on multi-billion euro satellites.





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LMS is an engineering innovation partner for companies in the automotive, aerospace and other advanced manufacturing industries. With 30 years of experience, LMS helps customers get better products to market faster and turn superior process efficiency into key competitive advantages.

With a unique combination of 1D and 3D simulation software, testing systems and engineering services, LMS tunes into mission critical engineering attributes, ranging from system dynamics, structural integrity and sound quality to durability, safety and power consumption. With multi-domain solutions for thermal, fluid dynamics, electrical and mechanical system behavior, LMS can address the complex engineering challenges associated with intelligent system design.

Thanks to our technology and dedicated people, LMS has become the partner of choice of more than 5,000 leading manufacturing companies worldwide. LMS is certified to ISO9001:2008 quality standards and operates through a network of subsidiaries and representatives in key locations around the world. For more information on LMS, visit www.lmsintl.com.



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