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LMS SCADAS

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Increasing productivity throughout the testing cycle

LMS™ SCADAS™ hardware can be used for all your testing requirements. They include portable solutions, compact mobile units and autonomous smart recorders as well as high-channel-count laboratory systems. Every device can be seamlessly integrated with dedicated and tailored software packages for accelerated measurement setup and correctly formatted results and analysis, such as LMS Test.Lab™ software and LMS Test.Xpress on personal computers (PCs) and LMS Smart™ software applications on tablets. This increases productivity throughout the testing cycle, from instrumentation to reporting.

Testing complex products
When developing new products, manufacturers are challenged to find the optimal balance between various, often conflicting requirements, such as energy efficiency, noise and vibration and durability. Current products are complex, include smart systems and come in an increasing number of varieties.

Additionally, today's fast-changing markets and classic cost and time-to-market development concerns put test departments under significant pressure. Increasing product complexity requires test engineers to handle a large variety of physical aspects and plan additional validation activities during the early design stages. Meanwhile, prototype testing needs to be conducted in a compressed timeframe.

Gaining insight and delivering quality
LMS SCADAS systems offer test engineers versatile and scalable high-precision measurement tools that can be used to conduct productive measurements during all development stages. The solution allows you to quickly gain insight into the root cause of problems.

LMS SCADAS systems help you increase productivity by delivering the data quality and format required to get the job done right the first time for a wide range of analog and digital sensors. The flexibility, performance and precision of LMS SCADAS hardware makes it an excellent data acquisition system for a broad range of multi-physics measurement applications; at any scale, in the lab or the field and with a PC or through autonomous recording. At the same time, using LMS SCADAS systems provide in-depth coverage for dedicated acoustic, vibration and durability engineering tasks. With its modular design and multipurpose functionality, LMS SCADAS represents a secure investment that can easily be extended to the scale of your measurement requirements.

Providing productivity, flexibility and precision

Take the fast track from measurement to insight

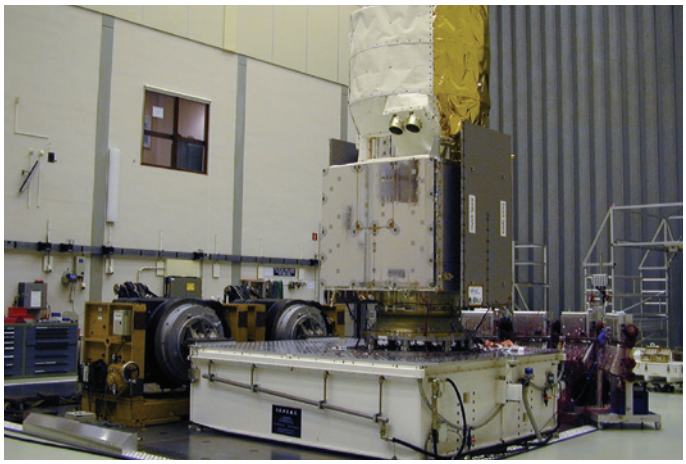
- Measure and synchronize a large variety of analog and digital sensor data for processing and analysis in a single file
- Obtain high data throughput for both low- and high-sample rates
- Use a single system for multi-physics applications
- Avoid multiple individual tests to gain instrumentation time
- Standardize, automate or autonomously run tests
- Streamline data acquisition, processing, analysis, reporting and sharing in a single integrated software application
- Facilitate plug-and-play deployment

A testing solution that fits your industry needs

- Combine various systems in a distributed setup
- Cover a wide variety of multi-physics critical applications
- Combine portable systems for field measurements with high-channel-count laboratory frontends
- Transfer a large amount of data over long distances and multiple frames

Optimize your measurement precision and data quality

- Limited harmonic distortion
- Highly precise phase matching
- State-of-the-art signal-to-noise ratio and dynamic range
- Accurately synchronized time data for both low- and high-varying signals, even over long distances or in a distributed test setup



The LMS SCADAS family

The LMS SCADAS suite of data acquisition systems covers a broad range of engineering applications for manufacturing industries. Here is a summary of system solutions:

LMS SCADAS Lab hardware is a rack-based, high-performance laboratory solution that offers channel-count independent data acquisition and highly reliable, high-speed throughput performance. LMS SCADAS Lab is well-suited for high-channel-count modal, aircraft ground vibration, acoustic, high-speed throughput or turbine testing applications.

LMS SCADAS Mobile hardware is designed for testing productivity and covers a wide range of noise, vibration, durability and multi-physics applications. LMS SCADAS Mobile frontends incorporate robustness, reliability and acquisition power into a portable, compact and rugged design.

LMS SCADAS Recorder systems is an intelligent mobile system for data recording without PC. You can use LMS SCADAS Recorder autonomously, as a smart recorder operated by a tablet or as a frontend system for in-field and laboratory applications.

LMS SCADAS XS hardware is a handheld solution for noise and vibration testing. It provides the ideal size, flexibility and measurement performance for optimal mobility and comes with a tablet application that allows mobile diagnostics and troubleshooting, even by nonexpert users.

LMS SCADAS Satellite systems are designed for high-channel-count measurements in rough testing conditions. The distributed architecture puts digitalization close to the sensors, saving cabling costs, improving signal quality and facilitating faster test setup and results.

Lab mobility offers increased flexibility by the possibility to connect any LMS SCADAS Lab to any LMS SCADAS Mobile or LMS SCADAS Recorder without having to create or re-instrument a test setup. The option to mix and match LMS SCADAS frames makes your investment expandable and increases productivity by offering extra channels and signal-conditioning capabilities.

Dedicated system controller modules allow you to expeditiously transmit data and offer many variants for optimal flexibility and effective acquisition. These modules include features such as Ethernet connectivity, tachometer and inter-range instrumentation group (IRIG-B) time codes, signal generation outputs, controller area network (CAN bus) inputs and a stop input.

Variants with a real-time bus allow you to integrate your LMS SCADAS frames into a broader Ethernet control automation technology (EtherCAT) network. This high-performing, bi-directional network type is typically used in real-time control applications, such as industrial digital networks or closed-loop test benches.

LMS SCADAS Lab for high-performance laboratory data acquisition

- A 19-inch rack-mountable frame with an alternating current (AC) power supply
- Scalability from eight eight to more than 1,000 channels
- Premium data acquisition with constant high throughput and channel density of up to 480 input channels in one frame
- The ability to measure an enormous number of channels
- A powerful system that takes limited space in the lab

An extensible solution for demanding lab testing

You can easily connect additional slave frames to LMS SCADAS Lab by using optical fiber cables. This type of modularity is convenient for noise and vibration laboratories and lets you configure a multi-frame system for more than 1,000 channels. You can assemble individual master frames into master-slave configurations and run it as one unit using a single master station. LMS SCADAS Lab offers you channel-count-independent signal conditioning and exceptional throughput performance, which makes the solution an excellent choice for applications such as high-channel-count modal testing, aircraft ground vibration testing, acoustic high-speed throughput or turbine testing.

Additionally, with lab mobility you can directly connect the system to LMS SCADAS Mobile or LMS SCADAS Recorder for additional measurements without creating a new test setup.

Securely test costly items

You can extend any LMS SCADAS Lab system to become a frontend for vibration-control applications with a hardware emergency stop. This includes a 24-bit effective digital-to-analog convertor (DAC) output with tapered startup and shutdown. It has a status output for advanced synchronization purposes, and lets you control safety using the hardware emergency stop and a power watchdog feature.

Specifications

- Up to 204.8 kilohertz (kHz) sampling rate per channel and throughput up to 19 mega samples per second (MSamples/s)
- 24-bit delta-sigma analog-to-digital (ADC) technology
- 150-decibel (dB) dynamic range
- Various signal-conditioning modules and a choice of commercially-available connectors, such as Bayonet Neill–Concelman (BNC), CAMAC LEMO® and Sub-D for patch panel configuration
- Can include onboard CAN bus, dual tachometer and signal generator support
- 1.25-gigabit (Gbit) hotlink fiberoptic, master-slave connection with long optical cables for distributed system configurations
- Quality components with extended temperature range for optimized reliability

LMS SCADAS Mobile for powerful and flexible mobile and lab testing

- A variety of frontends for versatile signal conditioning and data acquisition capabilities in a small-sized and portable frame
- The ability to accommodate from eight to 216 channels in a single frame
- Takes only a small space in, or on, a test object
- An optimal system for field and mobile measurements
- Significant testing productivity with compact systems
- Quiet operation, including fanless cooling, which is ideal for acoustic measurements

A complete portfolio for all field and lab testing requirements

LMS SCADAS Mobile hardware includes various systems to satisfy all your mobile testing needs, from ultralight yet robust systems of 2.5 kilograms (kg) that have a nominal 2.5-hour battery autonomy, to laptop-sized systems that can host from eight to 216 channels in a single frame.

Build a large test setup in the field

By using LMS SCADAS Mobile you can build a large field test setup with slave frames to expand mobile measurements to include hundreds of input channels. All systems can work in a true master-slave configuration with fully synchronized data saved in one measurement file. The distributed acquisition happens through optical cabling, and you can easily daisy chain several frames into a single measurement platform.

Component certification testing

In addition, you can extend any LMS SCADAS Mobile system to become a frontend for vibration-control applications or for certification testing of individual components under operational loads.

Specifications

- Up to 204.8 kHz sampling rate per channel and throughput up to 14 MSamples/s
- 24-bit delta-sigma ADC technology
- 150-dB dynamic range
- Can include onboard CAN bus, dual tachometer and signal generator support
- Master-slave configurations for distributed systems and channel expansion
- High-speed Ethernet host interface
- Military-standard (MIL-STD)-810F qualified for shock and vibration
- Rugged design and low power consumption

LMS SCADAS Recorder for autonomous and smart data recording

- Features a versatile data acquisition system that can work autonomously as a blind recorder, tablet-operated recorder or a frontend system for a laptop or PC
- Accommodates eight to 216 channels in a single frame
- Allows on-the-spot validation to prevent errors and annoying reruns
- Supports measurements while operating the test object

Increase recorded data quality by combining acquisition with instant analysis

With a wireless connected tablet you can instantly validate data while measuring it, which allows you to increase the quality of the recorded data by combining acquisition with immediate analysis. With this state-of-the-art remote control system, you can visualize and monitor data in real time and adjust settings in the field.

You can operate the LMS SCADAS Recorder in frontend mode, controlled from a PC or laptop, and parallel-stream the data to the PC and/or to a flash memory mass storage device through an embedded local area network (LAN) interface. This process allows you to visualize the data in real time as it is processed and saved.

Invest on a scale that fits your testing requirements

LMS SCADAS Recorder systems come in a variety of versions, from smaller-sized systems that host from four to 24 channels, to larger systems that can include 216 channels in a single frame. Additionally, you can combine various systems in a master-slave configuration. The large variety and modularity of the system enables you to make a scalable investment that fits your needs.

Specifications

- Up to 204.8 kHz sampling rate per channel and throughput up to 14 MSamples/s
- 24-bit delta-sigma ADC technology
- 150-dB dynamic range
- Includes onboard CAN bus, dual tachometer and signal generator support
- Master-slave configurations for distributed systems and channel expansion
- High-speed Ethernet host interface
- MIL-STD-810F qualified for shock and vibration
- Rugged design and low power consumption
- Easy-to-use recorder software for acquisition, measurement setup, instant data validation and data export

LMS SCADAS XS for maximal testing freedom with a handheld solution

- Combine broad noise and vibration testing functionality with the autonomy and freedom that comes with a handheld solution
- Test products in real-life circumstances
- Support expert and nonexpert users
- Instantly set up, monitor and validate
- Use as a standalone with a tablet or PC

Instantly test and troubleshoot your product

LMS SCADAS XS helps you perform fast and reliable measurements and comes with a tablet for instant investigation, diagnostics and troubleshooting. With its compact design, LMS SCADAS XS comfortably fits in your hand. It features reliable onboard data storage and a full working day of battery autonomy, offering the flexibility you need to improve testing efficiency.

Replay the entire recorded soundscape

LMS SCADAS XS can be combined with an optional LMS SCADAS 3D BHS for cost-effective binaural recording and immediate, high-quality data replay of any analog, Sony/Philips Digital interface format (S/PDIF) or headset channel. This integrated replay capability provides an easy and effective way to validate acoustic quality.

Extending LMS SCADAS XS systems

You can combine various LMS SCADAS XS systems in a distributed test setup that considers the different systems as individual frontends. The combined system synchronizes time signals while streaming to a single measurement file following the precision time protocol (PTP) based on the Institute of Electrical and Electronics Engineers (IEEE) 1588 standard. This configuration allows you to set up star topologies with a 50-meter cable length using a standard Ethernet connection.

Specifications

- Up to six hours of battery autonomy in typical use
- Replay in full standalone mode with a tablet or PC
- 12-plus input channels, including:
  - 12 analog
  - One optional LMS SCADAS 3D binaural headset (BHS)
  - One BHS digital input (including equalization)
  - Global Positioning System (GPS)
  - Digital controller area network (CAN)
  - Two analog tachometer inputs
- License-free functionality to export time data and make it accessible in various software formats

LMS SCADAS Satellite for distributed and rugged field data acquisition

- High-channel-count measurements in extremely rough testing conditions
- Built-in synchronization with other LMS SCADAS modules
- Improved signal quality by digitizing signals close to the sensor and transmitting digital data to the host frame
- Reduced instrumentation through reduction of cables, faster installation and easier field repair

Reducing test campaign costs

When testing large structures, a centralized setup increases instrumentation costs because numerous long cables need to be installed. In case of a sensor or cable problem, repair is a real challenge. With a distributed setup that includes LMS SCADAS Satellite placed near the sensors and connected with a single wire to LMS SCADAS Recorder, you can simplify instrumentation and repair, and reduce cabling and installation costs.

Improving signal quality

Lengthy cables compromise signal accuracy. Strain gauges and accelerometers are sensitive to noise pickup, electromagnetic interference and noise distortion. Using LMS SCADAS Satellite brings digitalization close to the sensor and provides digital and synchronized data to LMS SCADAS Recorder, improving signal quality.

Specifications

- Ingress protection rating protection rating (IP66/67) certified enclosure
- Operating temperature range from -40 Celsius (°C) / -40 Fahrenheit (°F) to +85 °C / 185 °F
- MIL-STD-810F shock and vibration resistance

Investing in reliable hardware

Siemens PLM Software ensures that your LMS SCADAS system investment will reliably function by following rigorous design standards, quality controls and services that are in line with International Organization for Standardization (ISO) guidelines. Careful tracking of every system module allows our services organization to carry out preventive maintenance. This process reduces the downtime for calibration or repair, and ensures reliable operation and stability during mission-critical applications.

Protect your investment

We provide the service you need to get the most out of LMS SCADAS. Annual hardware calibration provides update and adjustment services with an as-found and as-left report, fully compliant with the ISO9001-2015 standard. The hardware maintenance services include the same service and reports, and are complemented with a warranty extension. In the unlikely event that hardware fails, you can continue your measurement campaign by replacing the defective component with a module that has identical specifications. Both calibration and maintenance services can be extended with an ISO 17025-accredited calibration.

LMS SCADAS benefits

- ISO and MIL-certified components
- Optimal performance over multiple years
- Reduced system downtime
- Systems that withstand vibrations, shocks, water and dust
- A strong services organization that provides preventive maintenance
- Worldwide technical support and services

Supporting a wide range of engineering applications

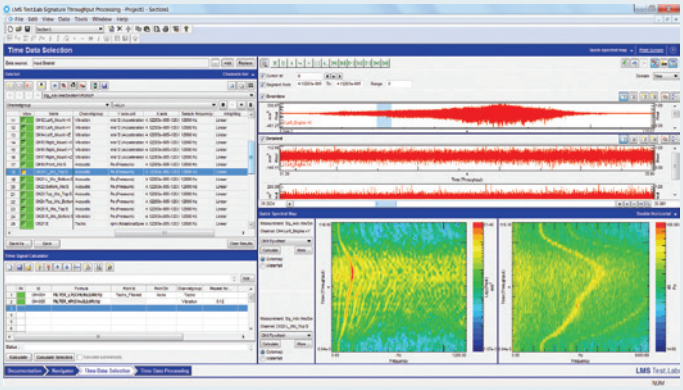
By integrating LMS SCADAS with dedicated data analysis software, such as LMS Test.Lab, you can fine-tune your product and collect useful information for colleagues in design and simulation for myriad engineering applications, including:

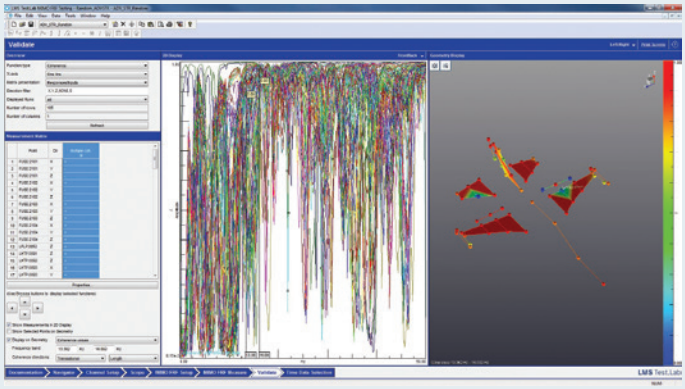
Structural testing

- Impact, multiple-input and multiple-output (MIMO) frequency response function (FRF), MIMO sine sweep, stepped sine and MIMO normal modes testing
- Modal analysis
- Operational deflection shape and time animation
- Operational and order-based modal analysis
- Ground vibration testing

Acoustic testing

- Sound intensity and sound power testing
- Sound quality testing
- Material and component testing
- Array-based holography and focalization
- Interior sound source localization
- In-room and exterior pass-by noise testing





Transfer path analysis
- Single reference transfer path analysis (TPA)
- Multi-reference TPA
- Time-domain TPA
- Operational path analysis

Rotating machinery testing
- Signature testing
- Time data acquisition and processing
- Order tracking, torsional vibration analysis and angle domain processing
- Powertrain testing

Durability testing
- Road load data acquisition and processing
- Multi-physics testing
- Engine durability

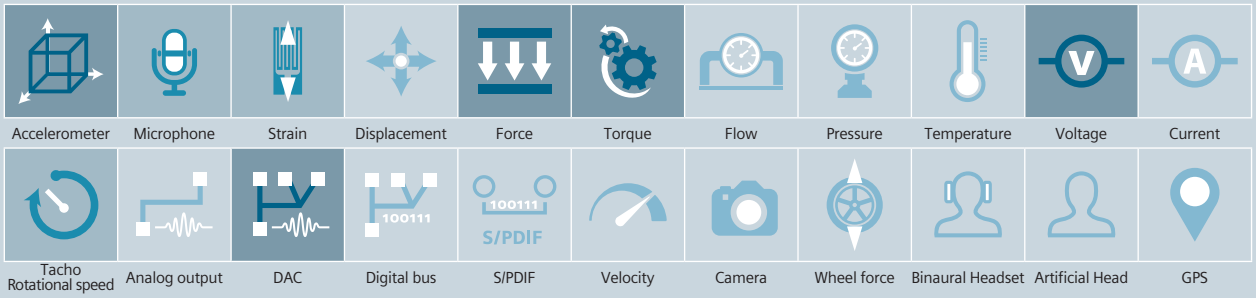
Vibration control and environmental testing
- Closed-loop random vibration and sine testing
- Combined mode testing (sine on random, random on random)
- Sine notching and random response limiting
- Single axis waveform replication
- Shock response spectrum limiting
- High-channel-count data reduction testing
- Qualification and acceptance testing

High-speed throughput testing
- Turbine testing
- Jet-engine testing
- High-channel-count industrial test benches

Multi-physics compatibility matrix

Structural testing

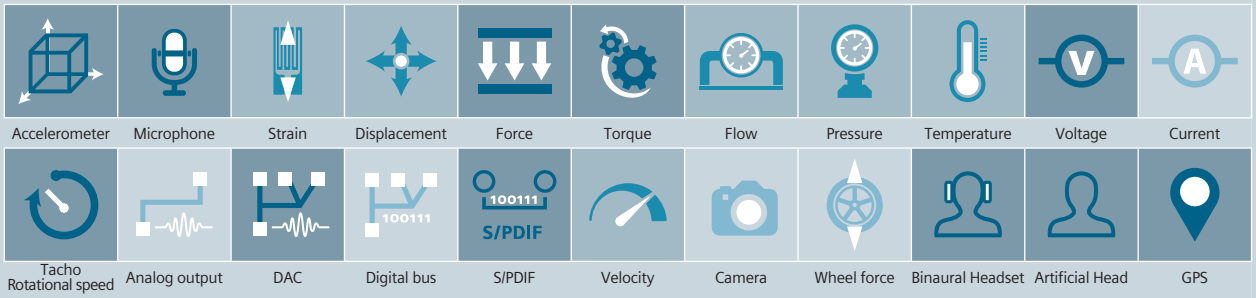
Sensors



Modules								
	V8	VS8	VD8	V24	VC8	VC8-QS	VM8	DB8
	VB8	SCS-V12	SCS-B12	T8	TCK8	RV4	VBDS4	DCH4
	VCF4	CIM2	WFI2	CN4	FR4	ESO64	DAC4	AO16

Acoustic testing

Sensors



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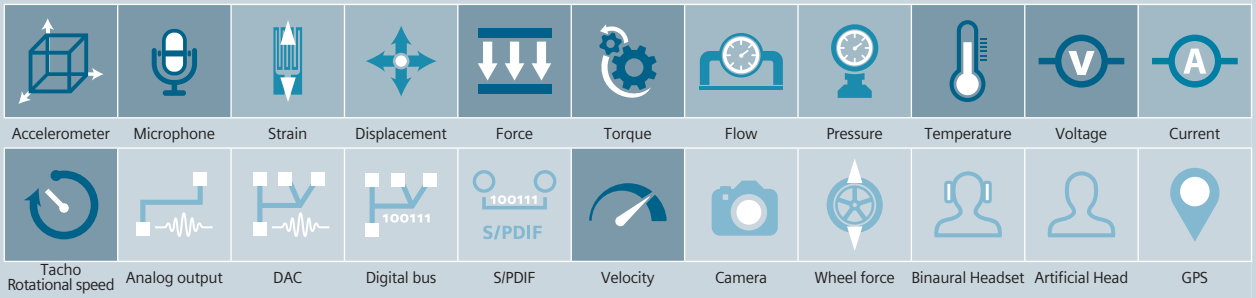
	VB8	SCS-V12	SCS-B12	T8	TCK8	RV4	VBDS4	DCH4
	VCF4	CIM2	WFI2	CN4	FR4	ESO64	DAC4	AO16

Rotating machinery testing

Sensors



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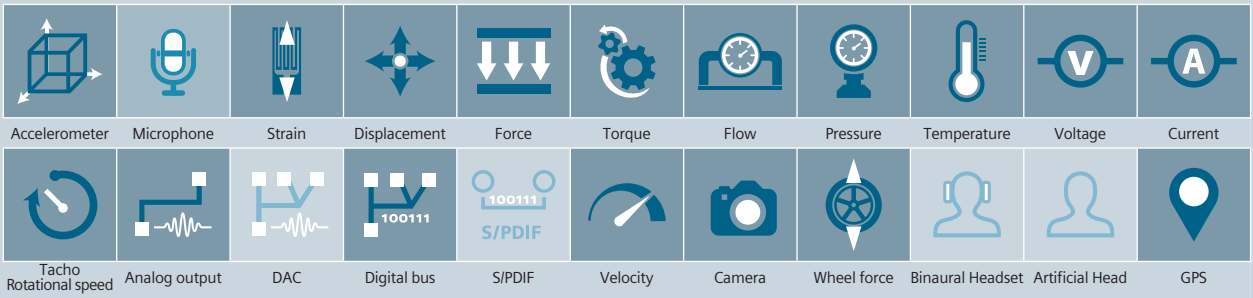
	VB8	SCS-V12	SCS-B12	T8	TCK8	RV4	VBDS4	DCH4
	VCF4	CIM2	WFI2	CN4	FR4	ESO64	DAC4	AO16

Typical	Optional	Unavailable

Durability testing

Sensors



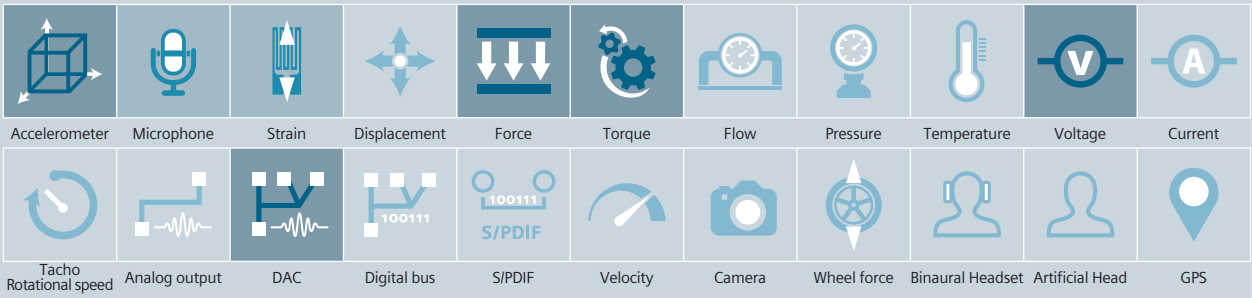
Accelerometer	Microphone	Strain	Displacement	Force	Torque	Flow	Pressure	Temperature	Voltage	Current
Tacho Rotational speed	Analog output	DAC	Digital bus	S/PDIF	Velocity	Camera	Wheel force	Binaural Headset	Artificial Head	GPS

Modules

V8	VS8	VD8	V24	VC8	VC8-QS	VM8	DB8
VB8	SCS-V12	SCS-B12	T8	TCK8	RV4	VBDS4	DCH4
VCF4	CIM2	WFI2	CN4	FR4	ESO64	DAC4	AO16

Vibration control and environmental testing

Sensors



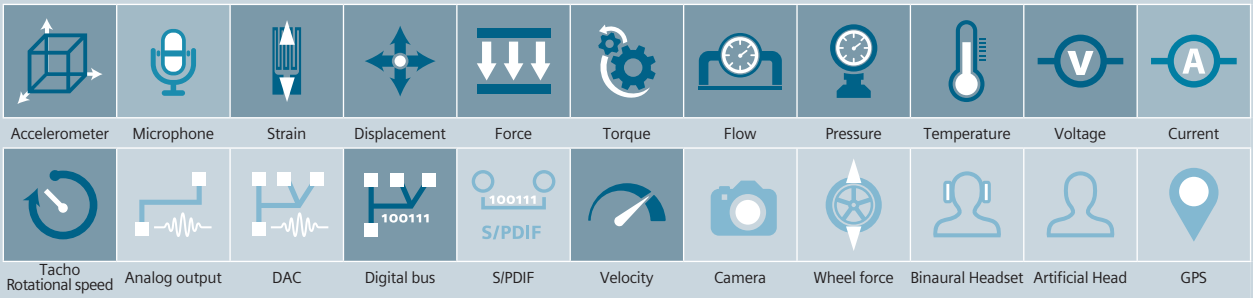
Accelerometer	Microphone	Strain	Displacement	Force	Torque	Flow	Pressure	Temperature	Voltage	Current
Tacho Rotational speed	Analog output	DAC	Digital bus	S/PDIF	Velocity	Camera	Wheel force	Binaural Headset	Artificial Head	GPS

Modules

V8	VS8	VD8	V24	VC8	VC8-QS	VM8	DB8
VB8	SCS-V12	SCS-B12	T8	TCK8	RV4	VBDS4	DCH4
VCF4	CIM2	WFI2	CN4	FR4	ESO64	DAC4	AO16

High-speed throughput testing

Sensors



Accelerometer	Microphone	Strain	Displacement	Force	Torque	Flow	Pressure	Temperature	Voltage	Current
Tacho Rotational speed	Analog output	DAC	Digital bus	S/PDIF	Velocity	Camera	Wheel force	Binaural Headset	Artificial Head	GPS

Modules

V8	VS8	VD8	V24	VC8	VC8-QS	VM8	DB8
VB8	SCS-V12	SCS-B12	T8	TCK8	RV4	VBDS4	DCH4
VCF4	CIM2	WFI2	CN4	FR4	ESO64	DAC4	AO16

Typical	Optional	Unavailable

Power and precision for structural testing

LMS SCADAS systems deliver quality data and accurate phase matching between accelerometer sensors, which are required for large frequency-range modal analysis. You can gather structural data that results from forced excitation using various input signal types, such as white noise, sweeps and pseudo random; or from operational loads or an impact hammer. By using LMS SCADAS, you can efficiently handle several hundred channels by combining a master frame with slave frames.

Combine LMS SCADAS with LMS Test.Lab Structures

Characterizing the dynamics of a structure used to be a long and complex process involving extensive trial-and-error and time-consuming test setups. This is no longer the case. When combining the LMS SCADAS systems with LMS Test.Lab Structures, it becomes easier to perform large-scale modal surveys in hours rather than days.

You can focus on identifying root causes of vibration problems and applying powerful analysis tools to explore the best solution for practically every structural weakness. Our modal testing experience, from impact testing of small structures to large-scale campaigns using hundreds of measurement channels, helps you maximize testing efficiency.

Structural testing

Sensors

Accelerometer	Microphone	Strain	Displacement	Force	Torque	Flow	Pressure	Temperature	Voltage	Current
Tacho Rotational speed	Analog output	DAC	Digital bus	S/PDIF	Velocity	Camera	Wheel force	Binaural Headset	Artificial Head	GPS

Modules

V8	VS8	VD8	V24	VC8	VC8-QS	VM8	DB8
VB8	SCS-V12	SCS-B12	T8	TCK8	RV4	VBDS4	DCH4
VCF4	CIM2	WFI2	CN4	FR4	ESO64	DAC4	AO16

Versatile acoustic and sound quality testing

You can use LMS SCADAS systems for acoustic testing campaigns of any scale that include microphones, intensity probes, large acoustic arrays, binaural headsets and digital binaural heads combined with other sensors such as tachometers and accelerometers. LMS SCADAS systems can help you generate specific signals such as pink noise, white noise and sine; replay signals and apply filtering.

Combine LMS SCADAS with LMS Test.Lab Acoustics

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 helps you conform to the latest international standards and engineering practices.

By directly addressing a wide variety of test-based acoustic engineering challenges that you face on a daily basis, combining LMS SCADAS with LMS Test.Lab Acoustics offers a complete and unique solution for acoustics testing and analysis in specific domains, such as straightforward acoustic analysis, material and component testing, sound power and pass-by noise testing, sound source localization, vibro-acoustic engineering and sound-quality and brand-sound engineering.

Acoustic testing

Sensors

Accelerometer	Microphone	Strain	Displacement	Force	Torque	Flow	Pressure	Temperature	Voltage	Current
Tacho Rotational speed	Analog output	DAC	Digital bus	S/PDIF	Velocity	Camera	Wheel force	Binaural Headset	Artificial Head	GPS

Modules

V8	VS8	VD8	V24	VC8	VC8-QS	VM8	DB8
VB8	SCS-V12	SCS-B12	T8	TCK8	RV4	VBDS4	DCH4
VCF4	CIM2	WFI2	CN4	FR4	ESO64	DAC4	AO16

Understanding the root cause of noise and vibration problems

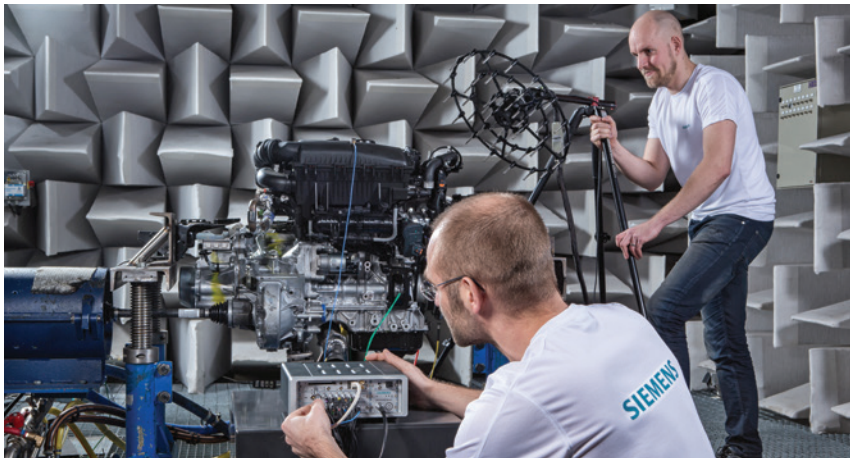
LMS SCADAS systems allow you to deliver high-quality data and accurate phase matching between accelerometer sensors as well as microphones and structural and airborne input sources, which are required for transfer path analysis in a large frequency range. This helps you to correctly identify operational loads and both structural and vibro-acoustic transfer functions.

Combine LMS SCADAS with LMS Test.Lab Transfer Path Analysis

LMS Test.Lab Transfer Path Analysis provides you with a systematic approach to test-based engineering processes and focuses engineering efforts on the components that matter the most. As a method to fully understand vibro-acoustic behavior, the solution assists you in troubleshooting vibro-acoustic issues and setting performance targets for each critical component. LMS Test.Lab Transfer Path Analysis is a highly efficient solution to help you identify noise problems and their origins.

Using LMS Test.Lab Transfer Path Analysis enhances productivity and is easy to use. It supports fast and efficient data processing and results interpretation. The clear graphical displays facilitate the understanding of path contribution. You can interactively modify loads and/or transfer paths and visually evaluate modifications in real-time, comparing multiple scenarios.

Collecting data for rotating equipment



LMS SCADAS hardware can help you collect specific data, such as tachometer signals, torsional vibrations, structural vibrations and combustion pressures. After the acquisition, you can identify orders, determine structural operational conditions by separating rotational and structural noise and vibrations, verify the critical speed and identify structural resonances. LMS SCADAS hardware also allows you to combine torsional vibrations with acoustic measurements to evaluate operational behavior, investigate instabilities in the rotating equipment and identify accuracy and structural integrity problems.

Combine LMS SCADAS with LMS Test.Lab Rotating Machinery

LMS Test.Lab Rotating Machinery provides you with a comprehensive suite of machinery vibration analysis solutions that help you develop quiet, efficient and reliable products. Targeted applications can help you master the complex process of machinery vibration analysis in systems such as engines, compressors, electrical motors, pumps and shafts.

LMS Test.Lab Rotating Machinery offers a comprehensive selection of tools, including waterfall mappings, order tracking, time-data acquisition and processing functions as well as specialized modules to help you analyze and visualize the vast amounts of data that are generated.

Rotating machinery testing

Sensors

Accelerometer	Microphone	Strain	Displacement	Force	Torque	Flow	Pressure	Temperature	Voltage	Current
Tacho Rotational speed	Analog output	DAC	Digital bus	S/PDIF	Velocity	Camera	Wheel force	Binaural Headset	Artificial Head	GPS

Modules

V8	VS8	VD8	V24	VC8	VC8-QS	VM8	DB8
VB8	SCS-V12	SCS-B12	T8	TCK8	RV4	VBDS4	DCH4
VCF4	CIM2	WFI2	CN4	FR4	ESO64	DAC4	AO16

Reliable systems for durability engineering

LMS SCADAS includes hardware versions that withstand harsh environmental conditions such as dust, water, extreme temperatures, shocks and vibrations. By applying universal signal conditioning, these dedicated systems can help you dramatically reduce the required equipment when simultaneously testing with various sensor types. The LMS SCADAS systems are expandable to include hundreds of channels and can be manually operated or run fully autonomously. They are scalable and compact and easily fit in limited space while still handling a large number of channels.

Combine LMS SCADAS with LMS Test.Lab Durability Acquisition

LMS Test.Lab Durability Acquisition is an integrated, end-to-end solution for road load data acquisition. From a single software platform, you have complete control of the full load data acquisition process. The application combines universal, multichannel data acquisition with a full suite of channel setup, measurement, validation, consolidation, reporting and data sharing tools.

Durability testing

Sensors

Accelerometer	Microphone	Strain	Displacement	Force	Torque	Flow	Pressure	Temperature	Voltage	Current
Tacho Rotational speed	Analog output	DAC	Digital bus	S/PDIF	Velocity	Camera	Wheel force	Binaural Headset	Artificial Head	GPS

Modules

V8	VS8	VD8	V24	VC8	VC8-QS	VM8	DB8
VB8	SCS-V12	SCS-B12	T8	TCK8	RV4	VBDS4	DCH4
VCF4	CIM2	WFI2	CN4	FR4	ESO64	DAC4	AO16

Secure dynamic vibration control and environmental testing

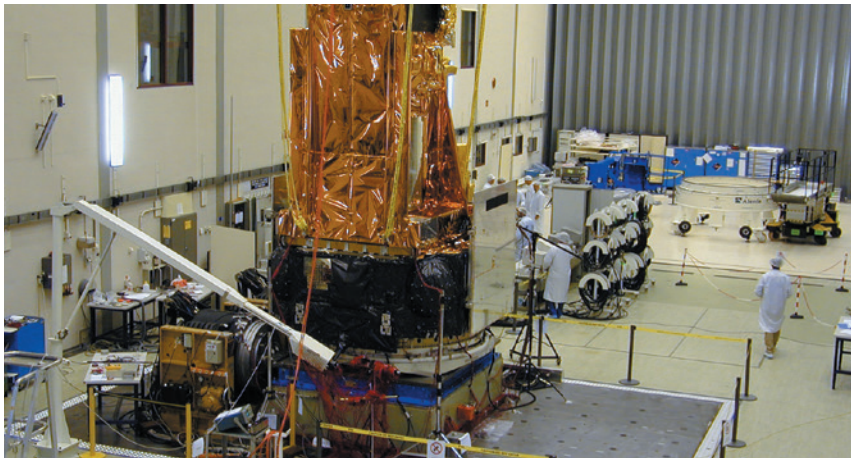


Image courtesy of ESA.

LMS SCADAS hardware helps you safely test components as well as delicate systems with reliable closed-loop control of single or multiple axes shakers using built-in self-check features, and both a safe shutdown mechanism and connectivity for a manual hardware emergency shutdown. Dynamic environmental testing can require a large number of channels, possibly spread over various measurement systems. The control equipment is separated from this, but accurately time-synchronized. The solution can also be tuned into other vibration control testing applications such as component lifecycle testing.

Combine LMS SCADAS with LMS Test.Lab Vibration Control and LMS Test.Lab Environmental

LMS SCADAS combined with LMS Test.Lab Vibration Control provides a complete four to eight channel solution for closed-loop vibration control testing. The vibration control system helps you easily certify and homologate products, ensuring products can operate under external excitation and vibration conditions. Conditions can range from normal to very extreme and include rough transportation circumstances.

LMS SCADAS combined with LMS Test.Lab Environmental delivers a complete solution for qualification and acceptance testing on large and sensitive structures including spacecraft, satellites and system prototypes. It is designed for parallel acquisition and online reduction of vibration channels during random or sine closed-loop vibration control testing, in reverberant rooms and for high frequency transient capture in deployment testing. The environmental testing solution also helps you test and validate the robustness of spacecraft design to guarantee load launch survivability by accurately reproducing launch acoustic environment levels in a large reverberation room.

Vibration control and environmental testing

Sensors

Accelerometer	Microphone	Strain	Displacement	Force	Torque	Flow	Pressure	Temperature	Voltage	Current
Tacho Rotational speed	Analog output	DAC	Digital bus	S/PDIF	Velocity	Camera	Wheel force	Binaural Headset	Artificial Head	GPS

Modules

V8	VS8	VD8	V24	VC8	VC8-QS	VM8	DB8
VB8	SCS-V12	SCS-B12	T8	TCK8	RV4	VBDS4	DCH4
VCF4	CIM2	WFI2	CN4	FR4	ESO64	DAC4	AO16

High speed throughput testing and turbine testing

Image courtesy of Airbus Defense and Space.

LMS SCADAS supports the high-speed throughput testing capabilities that are required to analyze the reliability and behavior of turbine engines. When measuring the full engine or larger subassemblies, the cabling becomes complex and all instrumentation typically has to withstand extreme conditions. Yet uninterrupted simultaneous recording and monitoring of all channels is crucial, leading to an enormous and continuous data stream. LMS SCADAS can help you conduct gapless recordings of a large number of channels at high sampling rates, resulting in terabytes of data per day during lengthy campaigns. The robust hardware has integrated signal conditioning for various sensor types, including dynamic strain, tachometer signals, acceleration and temperature.

Combine LMS SCADAS with LMS Test.Lab Turbine Testing

LMS SCADAS combined with LMS Test.Lab Turbine Testing provides you with an all-digital solution for complex turbine testing. Turbines and compressors in jet engines or power plants are subjected to stringent performance verification testing. This testing is compulsory for certification and is expensive and extremely demanding. Tests need to be performed properly the first time, measurement data has to be safe and usable and personnel and test object safety must be assured.

High-speed throughput testing

Sensors

Accelerometer	Microphone	Strain	Displacement	Force	Torque	Flow	Pressure	Temperature	Voltage	Current
Tacho Rotational speed	Analog output	DAC	Digital bus	S/PDIF	Velocity	Camera	Wheel force	Binaural Headset	Artificial Head	GPS

Modules

V8	VS8	VD8	V24	VC8	VC8-QS	VM8	DB8
VB8	SCS-V12	SCS-B12	T8	TCK8	RV4	VBDS4	DCH4
VCF4	CIM2	WFI2	CN4	FR4	ESO64	DAC4	AO16

LMS SCADAS modules

A016

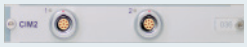
Sixteen-channel analog output module (LMS SCADAS Mobile or LMS SCADAS Recorder only)

AO16 is an output module that provides conditioned, calibrated and normalized analog copies of any input signal you capture with the LMS SCADAS Mobile frontend.

DB8

Eight-channel universal durability input module

Supports signal conditioning for voltage, ICP, DC-bridge, AC-bridge, AC-LVDT, active sensors, transmitters and potentiometers.

CIM2 

Dual video camera input module (LMS SCADAS Recorder only)

CIM2 enables the acquisition of synchronized video signals on LMS SCADAS Recorder frames. The cameras, included with the module, are connected through a local area network (LAN) interface for power and image transfer.

DCH4

Four-channel differential charge input module

DCH4 supports signal conditioning and processing to measure signals from differential and single-ended piezoelectric sensors.

CN4

Quad CAN bus interface module

CN4 allows synchronous acquisition of up to four CAN buses in parallel with the dynamic signals measured from the LMS SCADAS input channels.

ESO64

Sixty-four-channel EtherCAT output module

ESO64 connects your LMS SCADAS frame to the EtherCAT digital bus. You can select up to 64 input channels to stream in real time to the EtherCAT network (requiring the corresponding input module to be real-time compatible).

DAC4

Four-channel general purpose signal output module

DAC4 runs at a maximum sample rate of 204.8 kHz with useful bandwidth of up to 40 kHz for the generation of sine, sweep, random or user-defined signals.

RV4

Four-channel input module for rotational vibration

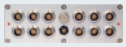
RV4 is a signal conditioner for low-speed and high-speed tachometer signals from analog, digital and/or incremental encoder sources. It accurately conditions, acquires and processes tachometer signals to produce time data, angle data or rotational speed data.

V8
V8
V8
SIEMENS

SAT1

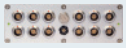
LMS SCADAS Satellite interface module

The SCM-SAT1 interface module enables the acquisition of synchronized time signals from SCS-V12 or SCS-B12 LMS SCADAS Satellites through a dedicated and rugged Ethernet interface. In addition to the signal transmission, the LMS SCADAS Satellite interface module provides continuous, remote power for the LMS SCADAS Satellites.

SCS-V12 

12-channel bridge satellite

The IP 67-certified SCS-B12 supports up to 12 strain gauges (in full-, half- or quarter-bridge) or piezo-resistive sensors.

SCS-B12 

12-channel V/ICP/TEDS sensor satellite

The IP67-certified SCS-V12 supports twelve voltage inputs, piezoelectric ICP sensors or sensors that require an external supply voltage.

T8

Eight-channel thermocouple module

T8 has eight isolated input channels to acquire dynamic temperature signals with on-board linearization for B, E, J, K, N, R, S and T thermocouples.

TCK8

Eight-channel IP67-certified temperature device

TCK8 extends the capabilities of LMS SCADAS Mobile so you can acquire a high number of K-type thermocouple signals. In combination with the CN4 module, up to four TCK8 devices can be connected to LMS SCADAS frames to support up to 32 thermocouple channels per CN4 module.

V24

Twenty-four-channel voltage/ICP input module

V24/V24M is used to support voltage inputs and piezoelectric ICP sensors or sensors requiring an externally supplied voltage. Each input supports data acquisition in X, Y and Z directions using tri-axial accelerometers.

V8

Four-/eight-channel voltage/ICP input module

V4/V8 support voltage inputs and piezoelectric ICP sensors for four or eight channels. In addition, the VS8 modules provide the same specification as V8, but with additional support for S/PDIF digital audio sources.

VB8

Eight-channel universal NVH input module

VB8-II supports signal conditioning for voltage, ICP, DC-bridge, AC-bridge, AC-LVDT, active sensors, transmitters and potentiometers.

VBDS4

Four-channel bridge and dynamic strain module

VBDS4 is a bridge, piezoelectric ICP® sensor and dynamic strain amplifier. In bridge mode, it supports full-bridge, half-bridge and quarter-bridge configurations, including bridge completion resistors and shunt calibration under full software control. Its monitoring outputs provide conditioned output signals per input channel.

VC8-ER

Eight-channel input module for voltage, ICP and charge module with extended range

VC8 supports signal conditioning and processing for voltage inputs and piezoelectric ICP sensors.

VC8

Eight-channel input module for voltage, ICP and charge module

VC8 supports signal conditioning and processing for voltage inputs and piezoelectric ICP sensors.

VCF4

Four-channel input module for floating ICP and charge module (LMS SCADAS Lab only)

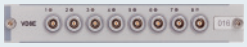
VCF4 supports signal conditioning for piezoelectric ICP and charge sensors. Each VCF4 channel offers the unique combination of floating input and an analog monitoring output.

VC8-QS

Eight-channel input module for voltage, ICP and charge module for Quasi-static measurements

VC8 supports signal conditioning and processing for voltage inputs and piezoelectric ICP sensors.

VD8



Eight-channel voltage, ICP differential input and output module with monitoring output

VD8/VD8MO have differential and single-ended inputs supporting voltage inputs and piezoelectric ICP sensors for eight channels. The VD8MO offers monitoring output in addition to the functionality of the VD8.

VM8

Eight-channel microphone input module

VM8 supports voltage input, piezoelectric ICP sensors and polarized or prepolarized microphones.

WFI2

Wheel force interface module (LMS SCADAS Mobile or LMS SCADAS Recorder only)

WFI2 is a dual-channel digital interface module used to interface with the KISTLER RoaDyn® 2000 wheel force transducer system. By means of an unshielded twisted pair (UTP) connection, a synchronous acquisition of all relevant wheel-force signals is supported: forces and moments in three directions, angle and angular speed, temperature and power.

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