

optomet.
LASER VIBROMETRY

Laser Vibrometry is getting SMART



THE
NEW
SMART
SERIES

One System, unlimited Possibilities



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The SMART System Idea

01

Lab in a Device



02

System Concept



03

Intelligence



SMART is ...

- **Lab in a device**
- System concept
- Intelligence

System Concept

The SMART system idea:

SMART is ...

- Lab in a device
- **System concept**
- Intelligence



- Fully synchronized
- Unlimited devices
- Software and hardware

SMART is ...

- Lab in a device
- System concept
- **Intelligence**



Auto-range selection

The best measurement range is automatically selected

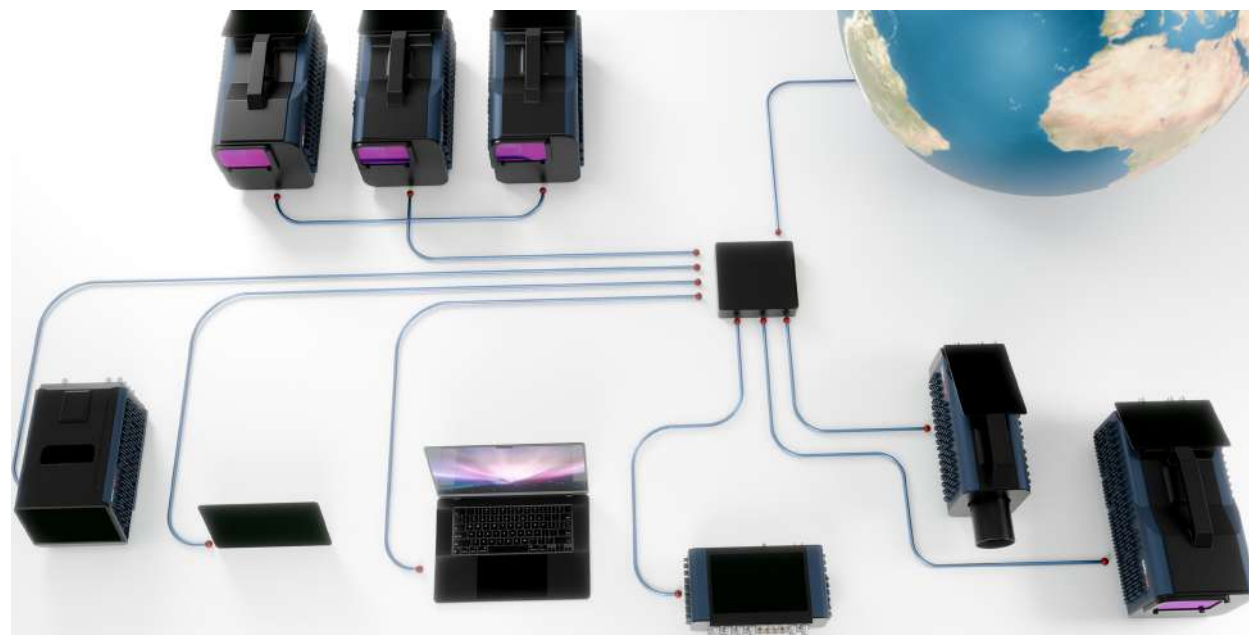
Adaptive filters

Advanced signal processing algorithms for a consistently high signal-to-noise ratio

Click and Go

Proper settings are intelligently determined by the SMART device so you can focus on testing

Intelligent Devices



Intelligent System

Auto-synchronization

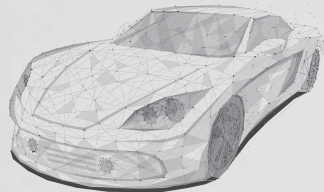
Just connect multiple SMART devices – and everything is taken care of

Intelligent 3D-calibration

Automated calibration process for fastest set-up times

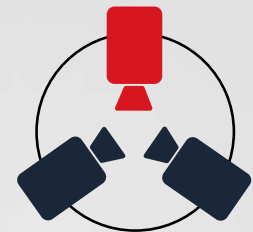
Intelligence

Software & Hardware



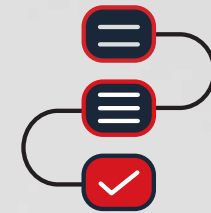
Measurements supported by 3D-models

Simply measure complex structures with intelligent calibration, easy positioning, accurate data and seamless animations



Simultaneous acquisition

Analyze time and frequency data in real-time, even from different devices simultaneously



Intuitive workflow

Guiding you through the measurement process



Intelligent 3D-calibration

Fully-automated calibration process saves time and cost



Advanced analysis

Process the data with your preferred post processing software



...from a single supplier

- Upgradeable to 3D-Scanning
- Integrated DAQ box
- Integrated reference vibrometer¹



SMART
SCAN+

* 1 optional

SMART SCAN+



Versatile 7-inch touch display

Expanded connectivity:
Extensive range of ports
for data acquisition

15x



Seamless synchronization
with other SMART devices

Non-contact references measurements
with an additional fiber head



8x

A wide variety of connectivity
options for signal generation

More than a vibrometer

Precise scanning vibrometer, DAQ box, arbitrary signal generator, and more in one compact device

Non-contact

Analyze structures truly without retroactivity using an additional fiber head for non-contact reference measurements

DAQ box integrated

Record reference signals from any kind of sensor

Seamless integration

All SMART devices form a system of hard- and software

Fully-featured

Simple upgrade to the SMART 3D-Scan system with two additional devices

Automotive Testing

Haptic displays

Improve haptic perception by optimizing surface vibrations

Suspension

Test how different suspension components react to shocks

Chassis and body parts

Validate CFD simulations under real-world conditions in wind tunnel testing

Electric motors

Optimize quietness and robustness by vibration analysis

Battery and battery cells

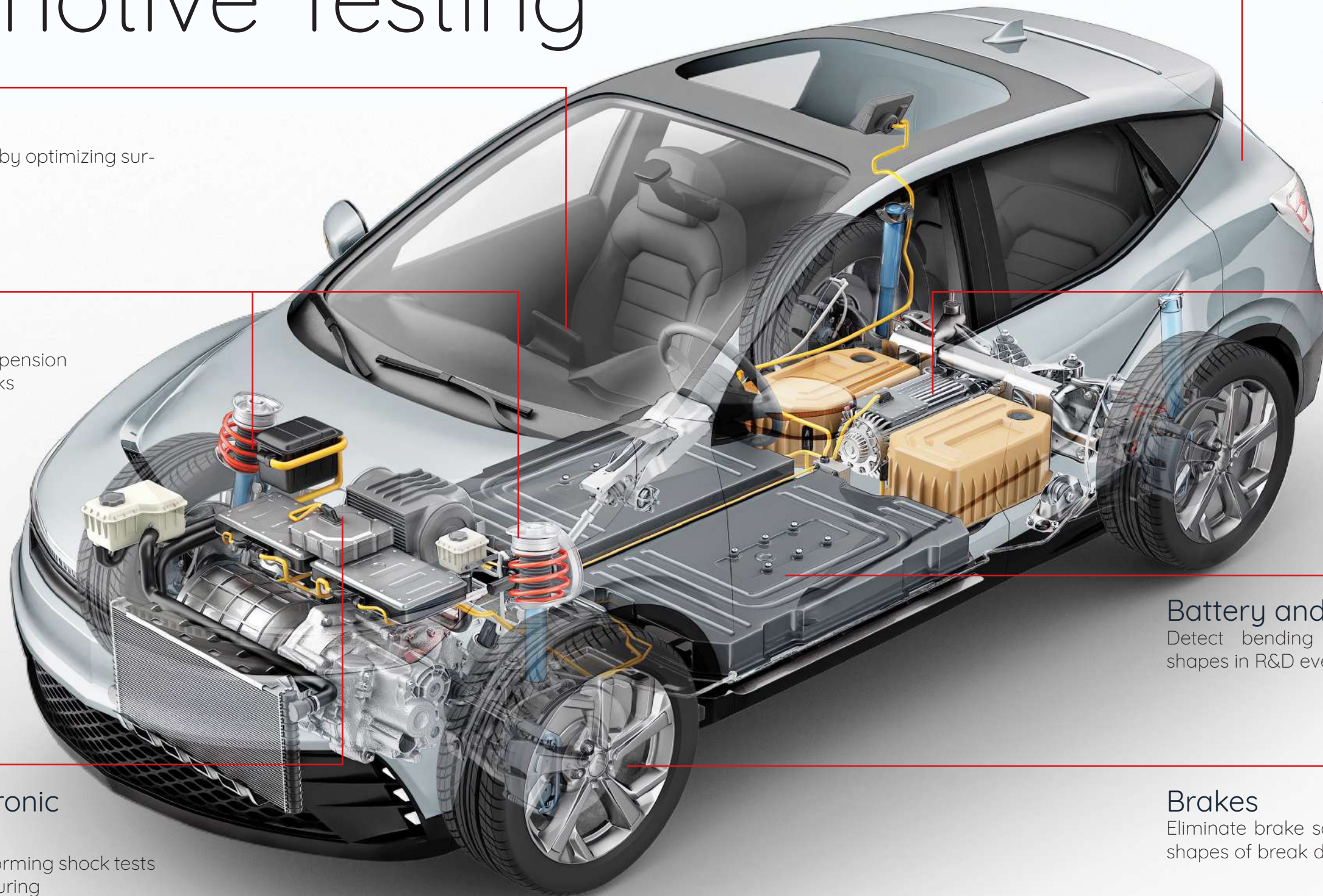
Detect bending and analyze deflection shapes in R&D even on hot surfaces

Electric and electronic components

Improve durability by performing shock tests with precise vibration capturing

Brakes

Eliminate brake squeal by analyzing modal shapes of brake disks





Turbine

Non-destructive testing

Detect defects before they lead to problems

Integrated modal analysis

Seamless switching between data acquisition and analysis in one fully-featured software

On any surface

Measure vibrations on any kind of surface even if it's glowing hot

Acoustic Systems

Zero noise

100 % passively cooled devices

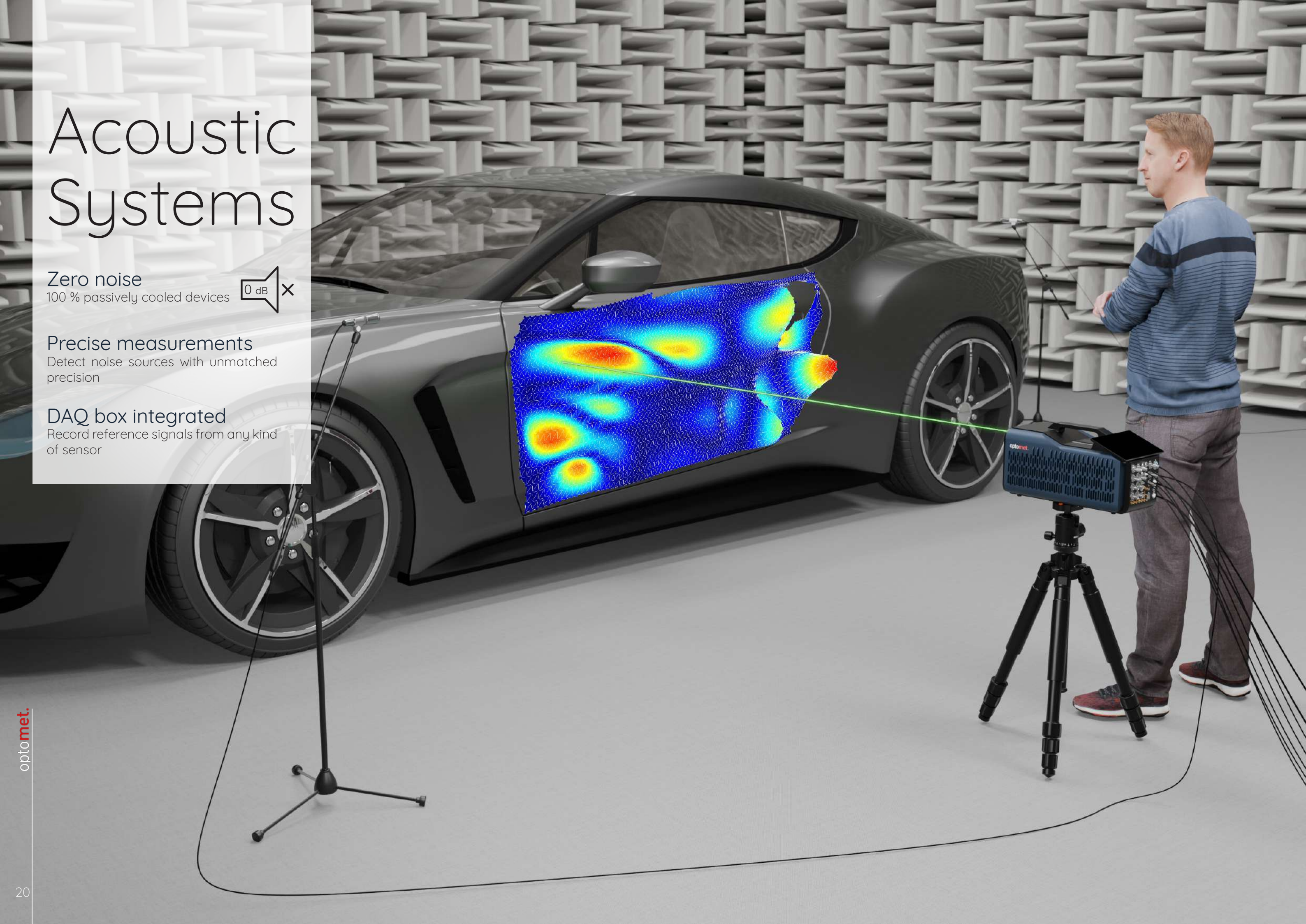


Precise measurements

Detect noise sources with unmatched precision

DAQ box integrated

Record reference signals from any kind of sensor



SMART Full Body Vibrometry

Simultaneous synchronized measurements

Multiple devices measuring together as one for faster results even on complicated full-body measurements.

Ultra-precise measurements

Accurate measurement of smallest vibrations (Significantly simplified excitation compared to camera-based techniques that require strong vibrations)

Flexible measurement setups

Position the devices according to your needs. Full-body measurements can even be performed with a single scanning vibrometer with SMART Lab's intelligent stitching features.

Intelligent calibration

Automated calibration process enabling fast setup at the test site



SMART Full Body Vibrometry

The fast solution

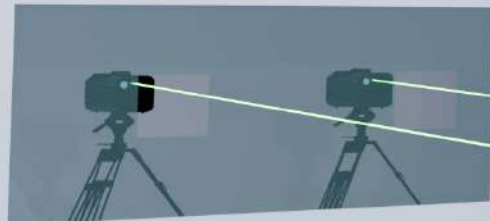
Multiple devices measuring together as one, automated calibration and 100 % external preparation for minimum time in the wind tunnel

The precise solution

High spatial resolution, high frequency resolution, and accurate measurement of even the smallest vibrations

The wideband solution

Analyze hearable and inaudible vibrations alike – from subsonic to ultrasonic noise



The non-contact solution

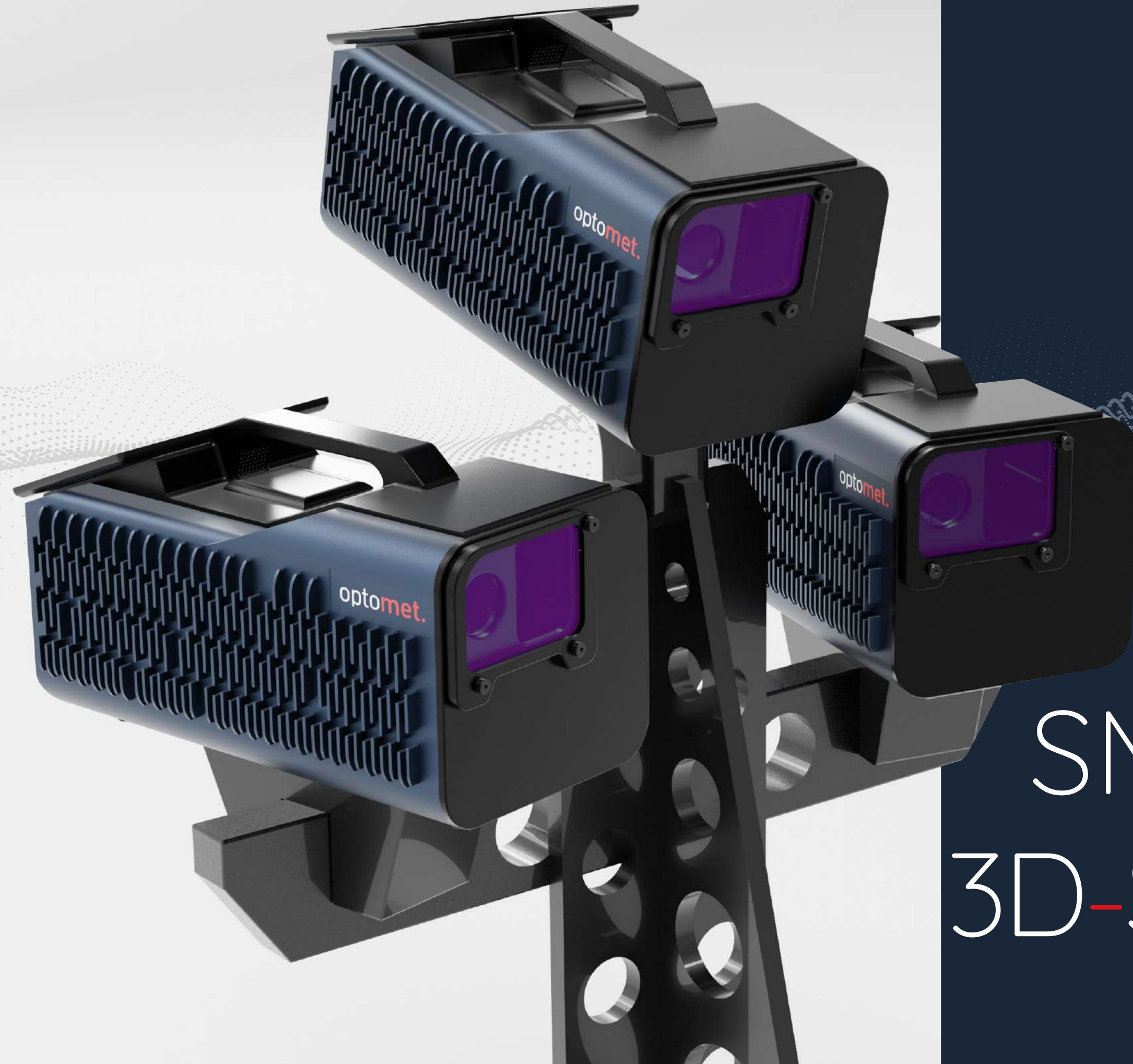
Zero influence on the vibrations to be measured

The convenient solution

Simple setup with only two cables and the most compact design on the market

The zero-noise solution

0 dB(A) noise caused by the vibrometry system through 100 % passively cooled devices



SMART 3D-SCAN

SMART 3D-SCAN

Three fully-featured SMART Scan vibrometers

Forming a 3D vibration analysis system

Extendable system

Add more SMART Scan vibrometers to form
a full-body vibration analysis system

Intelligent calibration

Fully-automated calibration process saves
time and cost

Flexible system

Various system configurations from
three separate Scanning vibrometers
to full-body vibrometry





optomet.

SMART Single+

SMART Single+

The clever entry to vibrometry, combining innovative technology with practical know-how for sophisticated vibration analysis

The multi-talent

Long-distance measurements or test objects in close proximity: The SMART Single+ can do both – even at the same time with an additional fiber head.

Civil engineering

Non-destructive testing and vibration analysis of bridges, buildings and railroads



Toolmaking and mechanical engineering

Achieve deep understanding of machine dynamics



Acoustics and ultrasonics

Optimize the hearable and inaudible sound with unheard of precision



Versatile 7-inch touch display

Expanded connectivity:
Extensive range of parts
for data acquisition

Seamless
synchronization
with other SMART
devices

Non-contact reference measurements
with an additional fiber head

A wide variety of connectivity
options for signal generation

SMART Multi-Fiber

- 4 x Fiber Heads
- Simultaneous measurements
- DAQ-Box integrated
- 4 x full bandwidth



SMART Multi-Fiber

Ultimate flexibility

Adaptable and precise, making it ideal for a variety of different applications

Quality control and production

Deliver only flawless products by detecting defects in advance

Harsh environments

No matter if it is cold, hot, or humid: Our robust fiber heads withstand the conditions



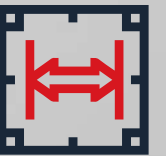
X-Ray proof

Flexible fiber cables connect the robust fiber heads with the SMART Multi-Fiber vibrometer



Tight spaces

Compact fiber heads can be placed anywhere and measure without physical contact



Shaft motion

Simultaneously detect the motion in x- and y-direction in up to two or more different positions



Differential measurements

Continuously subtract the vibrations of two points for insightful analysis



SMART 3D-Fiber



- 3D single point
- In-plane vibrations
- Out-of-plane vibrations

SMART 3D-Fiber

Modal analysis

Enabled by combining the 3D vibration data with the data from an additional reference fiber head

3D vibration analysis

Gain insight in all vibrational material characteristics including information on strain and gauge

Flexibility

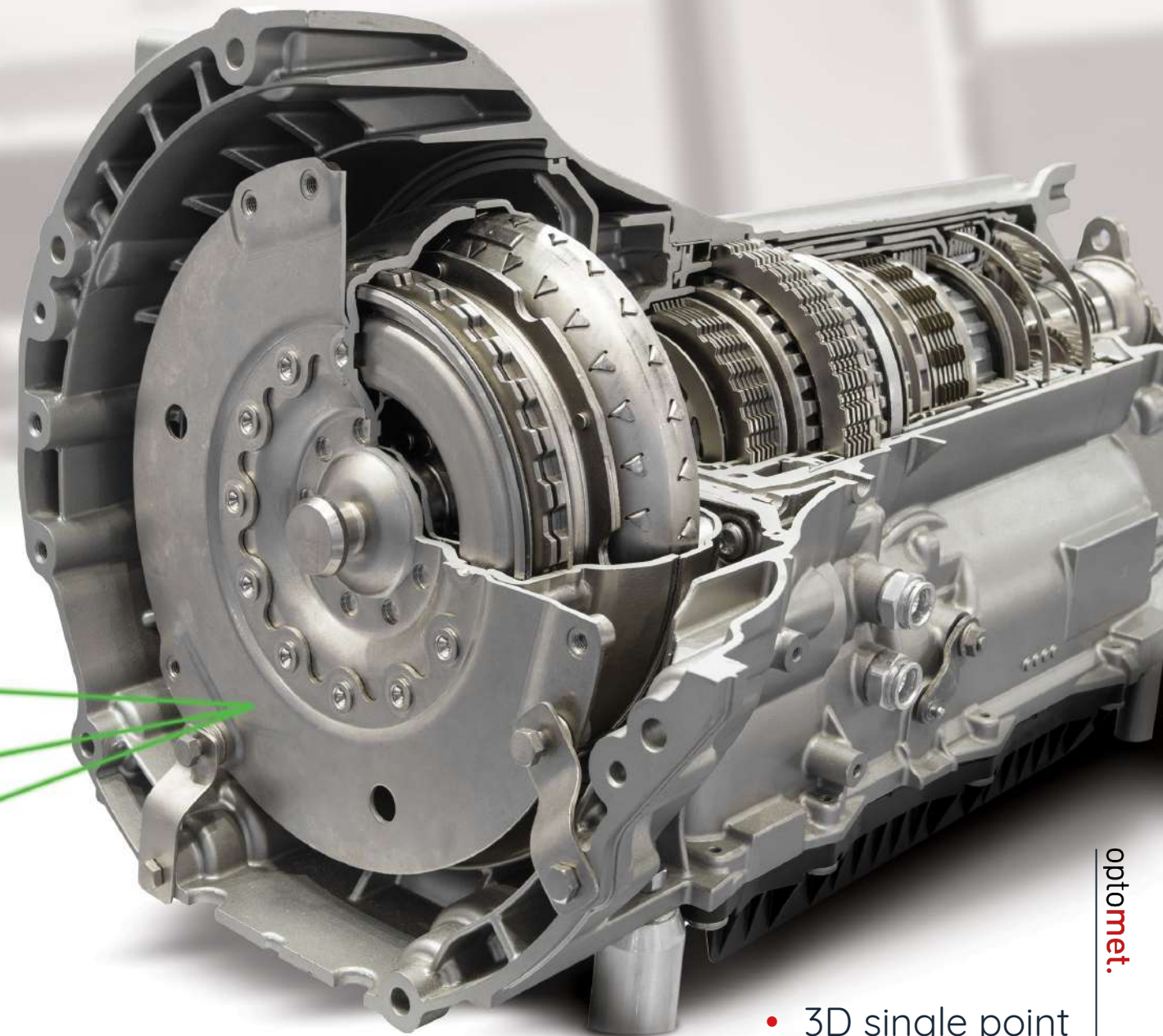
Enjoy true flexibility with different exchangeable fiber heads for any application and measurements under any conditions

Suitable for tight spaces

Collect vibration information from difficult to access areas made possible by the small dimensions of the 3D fiber head

FEM Model validation

Using 3D vibration data is especially important for complex structures



- 3D single point
- In-plane vibrations
- Out-of-plane vibrations

Fiber Heads

Maximum flexibility for a system that fits your needs

- Exchangeable fiber cables and fiber heads
- Variable cable lengths

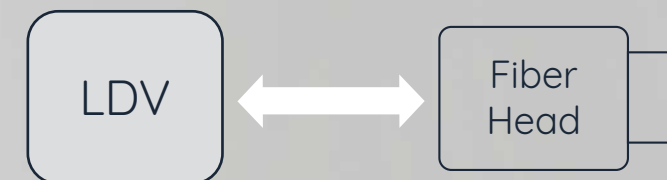
3D Fiber Head

Compact Fiber Head



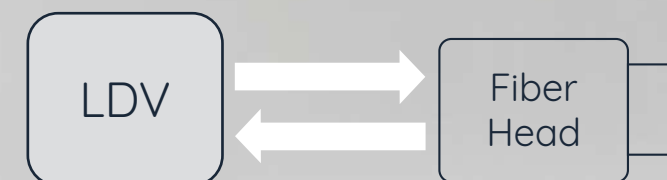
Dual Fiber System

Single-fiber:



- The same cable for outgoing and incoming signal
- Signal interference
- Suboptimal signal to noise ratio (SNR)

Optomet solution: dual-fiber



- + Separate cables for outgoing and incoming signal
- + Optimal signal to noise ratio (SNR)
- + Improved signal integrity

Auto Focus Fiber Head



Connect Multiple Devices

SMART DAQ

SMART DAQ

Compact 3 in 1 solution

- DAQ box
- Oscilloscope
- Signal generator



16 Seamless data acquisition on
channels simultaneously

4x

High-frequency
Up to 50 MHz

+

12x

High-dynamic
range
24 bit precision

Seamless experience

Compatibility with a wide variety of sensors both with and without IEPE on all SMART series devices

SMART functionality

Precise synchronization across multiple devices combined with an intuitive and seamless software

High-frequency data

Acquisition of high-frequency signals up to 50 MHz

More than DAQ

8-channel arbitrary function generator, trigger functionality and synchronization



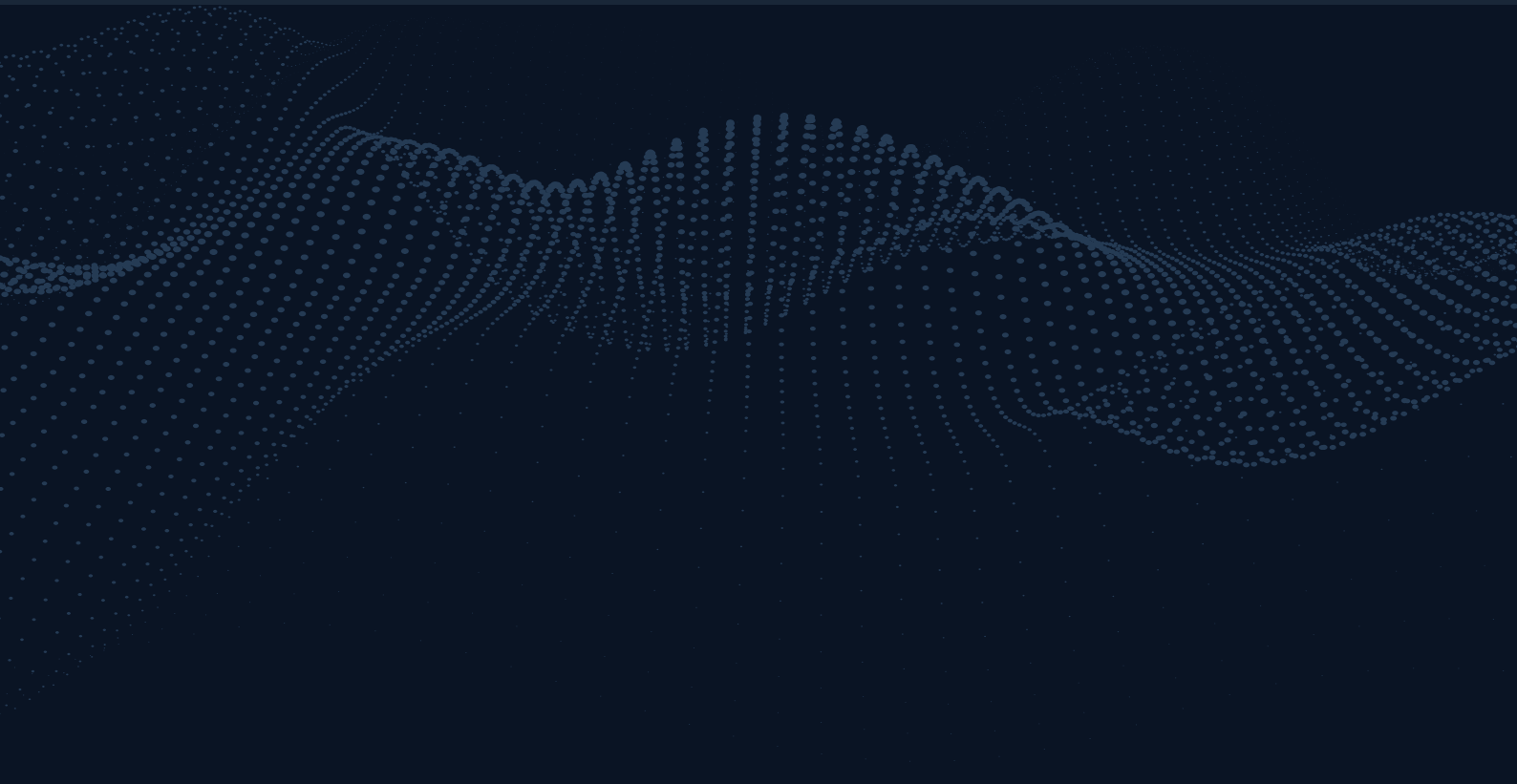
about optomet

Laser Doppler vibrometry since 2004

Since 2004, Optomet has been at the forefront of innovation in the development and manufacturing of digital laser Doppler vibrometers, high-precision instruments for the contactless measurement of vibrations at both single points and across entire surfaces. Our modular systems provide the optimal solution for a variety of applications - from highly to low reflective materials, microstructures to entire buildings. With the introduction of the SMART series, the company underscores its commitment to pushing the boundaries of technology and offering its customers solutions that exceed their expectations.



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Meet Optomet at events and trade fairs.
Our sales team will be happy to help you with any
questions you may have about our products or
the feasibility of your measurement.