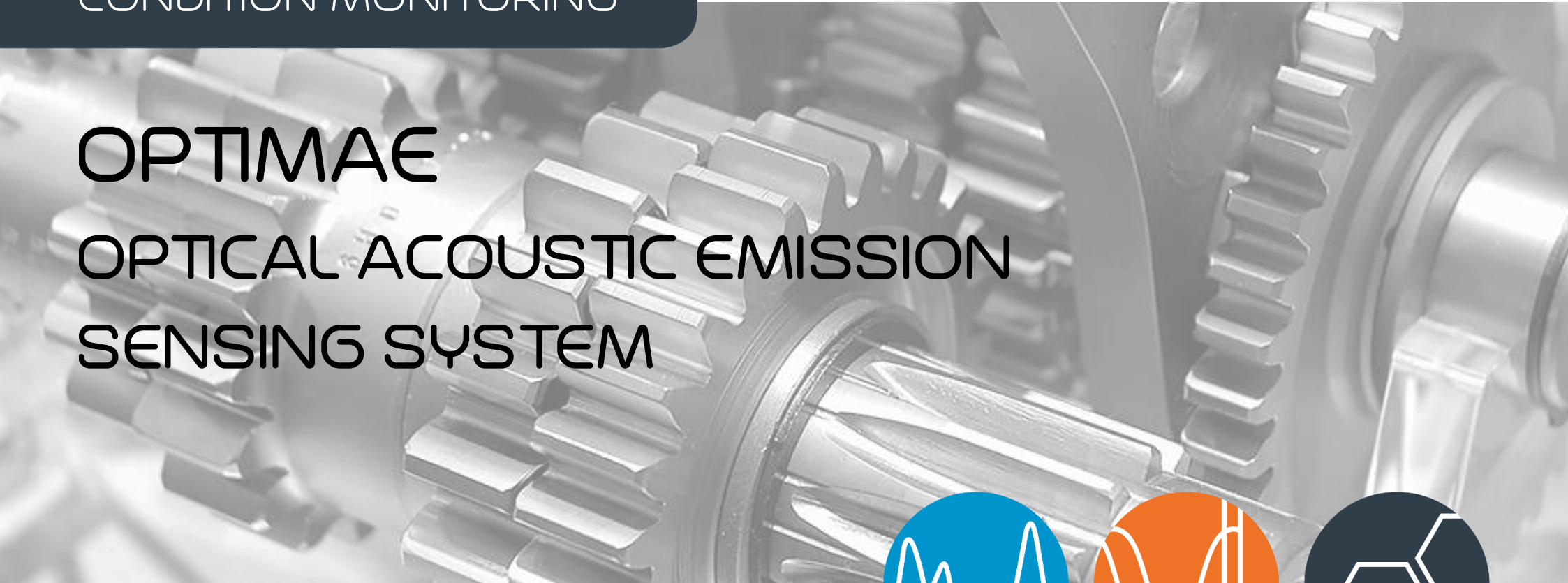


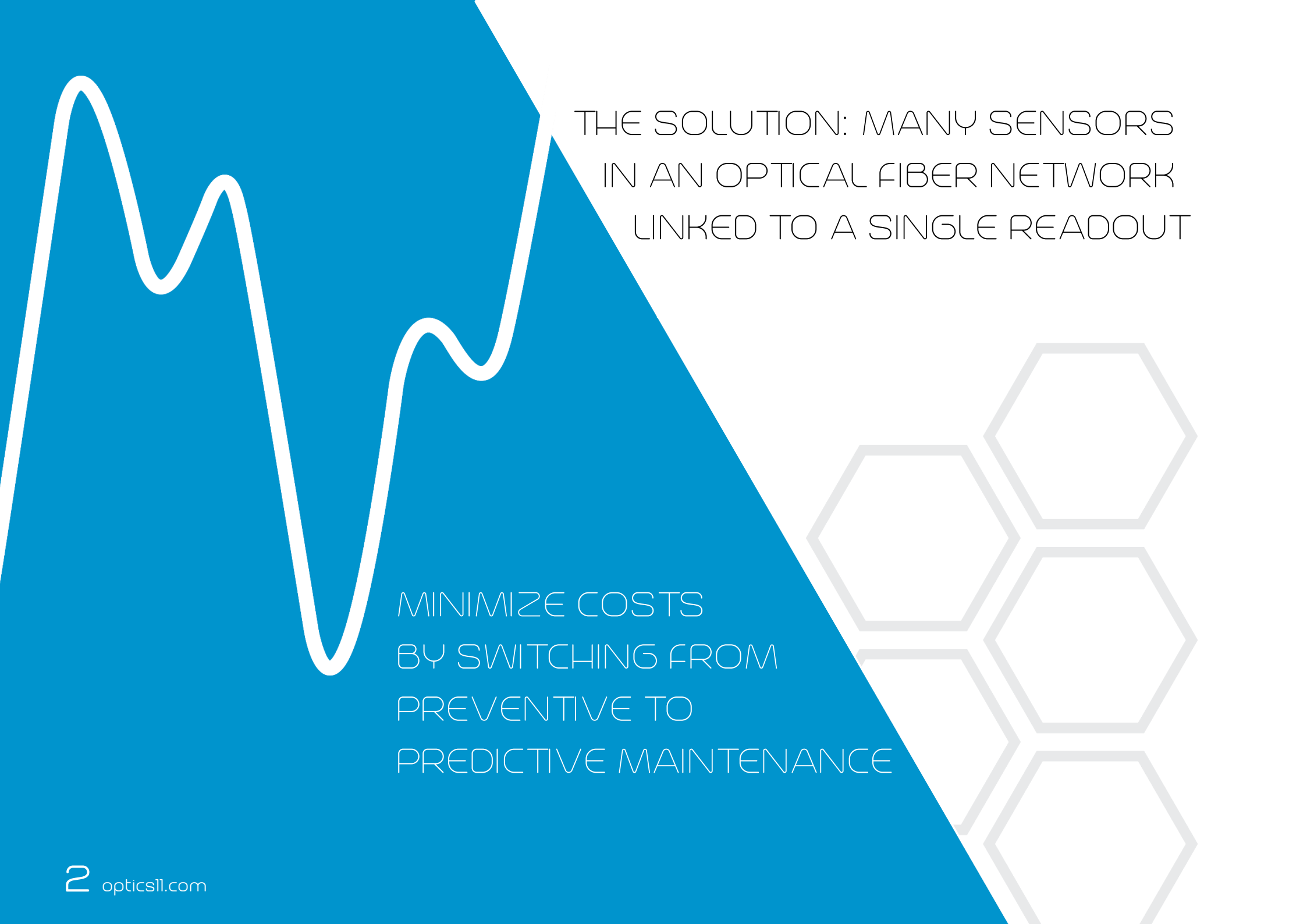
CONDITION MONITORING



OPTIMAE

OPTICAL ACOUSTIC EMISSION SENSING SYSTEM





THE SOLUTION: MANY SENSORS
IN AN OPTICAL FIBER NETWORK
LINKED TO A SINGLE READOUT

MINIMIZE COSTS
BY SWITCHING FROM
PREVENTIVE TO
PREDICTIVE MAINTENANCE

MAXIMISE UPTIME AND LIMIT MAINTENANCE INTERVALS

Do you have high value equipment that plays a crucial role in your activities? Did you consider monitoring your equipment and however encountered challenges with existing solutions? Chances are you had to deal with harsh conditions such as high temperature, radioactivity or strong EMI, remote location of your equipment and limited installation space.

OptimAE is the acoustic emission sensing system that deals with these and many other challenging conditions. It consists of a network of miniaturized optical acoustic sensors which can be separated kilometres apart, is extremely sensitive and allows for overall costs reduction (cost per sensing point).

Optical sensors allow for better SNR, reliability and better modelling of systems (digital twin).



APPLICATIONS

There are many applications that benefit from our solution:

- Bearings and rotating equipment (gearboxes, turbines, compressors)
- Partial Discharge detection (high voltage equipment, cable joints)
- Process monitoring (flow rate/ flow regime/ fluid phases, leaks, intrusion)
- Remote placed equipment (installed on the seabed, offshore)



MEASURE RIGHT
AT THE LOCATION
OF THE ACOUSTIC
SOURCE



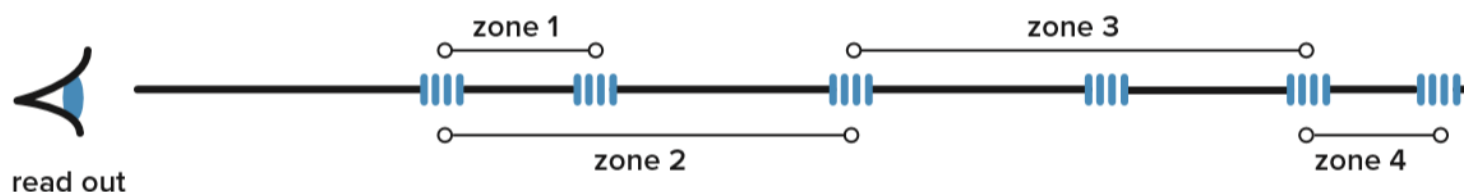
unique
patented
technology

OPTIMAE TECHNOLOGY

Acoustic emission measurements are best performed with optical fiber technology, since it is highly sensitive and can measure with extremely low noise in exceptionally harsh environments. The underlying technology of our sensors is the ZonaSens technology.

This patented interferometric principle measures between two reflective parts in a fiber (FBGs), therefore makes that part of the fiber extremely sensitive to strain. Minute changes to the fiber caused by acoustic waves will be detected.

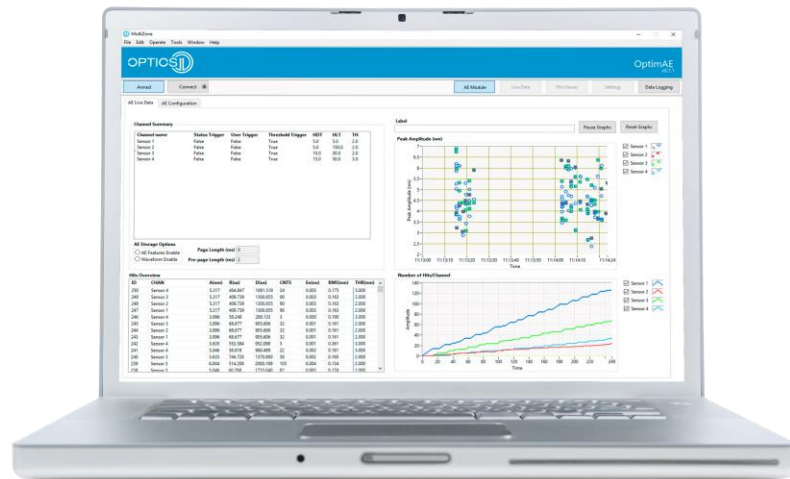
Besides the optical advantages – such as the possibility to have kilometers of fiber between the readout and sensors, adding sensors without compromising measuring speed and the resistance to EMI – our sensors are fully passive. Just a small mandrel wrapped with optical fiber, with no electric signals involved. Simple and elegant.



HARDWARE & SOFTWARE

All acoustic emission sensors exclusively work with the OptimAE readout and software. This interrogator can measure multiple miniaturized sensors simultaneously in a standard telecom optical fiber network.

The digital output allows easy integration with your existing control and acquisition system (SCADA).



TECHNICAL SPECIFICATIONS

Sensors performance¹

Dynamic range at 300 kHz
Sensitivity
Equivalent sensitivity
Frequency range
Spectral noise density
Broadband noise floor

Acoustic Emission sensor

80 dB
-20 dB re nm/ μ bar
-45 dB re V/ μ bar
1 kHz to 500 kHz
150 f ϵ / $\sqrt{\text{Hz}}$
105 p ϵ

Embedded AE sensor

80 dB
--²
--²
1 kHz to 500 kHz
down to 50 f ϵ / $\sqrt{\text{Hz}^2}$
down to 35 p ϵ^2

Sensors physical

IP rating
Dimensions
Material
Mounting Method
Weight
Cable bend radius

IP68
17.5 x 22 x 22 mm
Aluminium anodized
Clamp / Adhesive
16 gr
 ≥ 5 mm

--
 $\varnothing 250$ μ m (fiber)
Polyethylene (fiber)
Embedded
--
 ≥ 5 mm

Operating temperature

-40 to 80 °C (ST version)
-40 to 200 °C (HT version)

OptimAE interrogator

Sampling rate
Signal resolution
Data output
Multiplexing capability
Signal acquisition
Distance sensors to readout

1 MHz
32 bit
Digital (TDMS file)
Up to 16 sensors
True simultaneous
10s of km

¹ Different sensor configurations are possible, please contact us for full options.

² Value might vary depending on embedded sensor design and application.



ALL SENSORS
ARE INDIVIDUALLY
CHECKED IN
PERFORMANCE,
ASSEMBLY AND
OVERALL
QUALITY



ABOUT OPTICS11

Optics11 is a fast-growing high-tech company that offers revolutionary optical fiber measurement systems for applications in acoustic monitoring, acceleration, strain sensing and more.

The combination of unique interferometry concepts and advanced mechanical transducers (MEMS) provides exceptional characteristics to our systems. The underlying shared technology enables our systems to be more sensitive, affordable and have a higher bandwidth compared to existing industry standards.

We love making cutting-edge technology fit for use!

Please contact us at info@optics11.com for more information, technical data sheets, or to speak with a representative.



CONTACT
INFORMATION

Optics11
+31 20 598 7917
info@optics11.com
www.optics11.com

VISITING
ADDRESS

Optics11
WN building
De Boelelaan 1081
1081 HV Amsterdam
The Netherlands

SHIPPING
ADDRESS

Optics11
De Boelelaan 1081
1081 HV Amsterdam
The Netherlands

