Optimizing structural health monitoring

USING OPTICAL TECHNOLOGY

Danilo Ginez

HBK:PUBLIC

Introductions – Danilo Ginez

- **Analista de Instrumentação**
- 18 anos de experiencia na área de instrumentação da HBM
- **e-mail:** danilo@hbkworld.com

Challenges of SHM

WHERE OPTICAL TECHNOLOGY CAN HELP

#DURABILITY

#STABILITY

#RELIABILITY

Challenges of SHM

- Long periods of operation

OPTICAL TECHNOLOGY

Silica

Resistant

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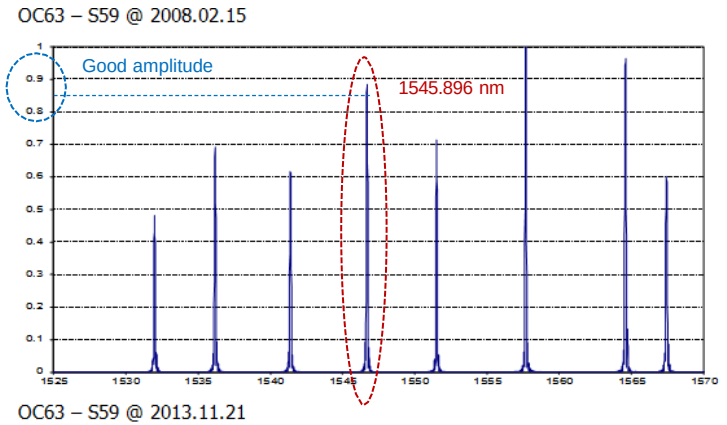
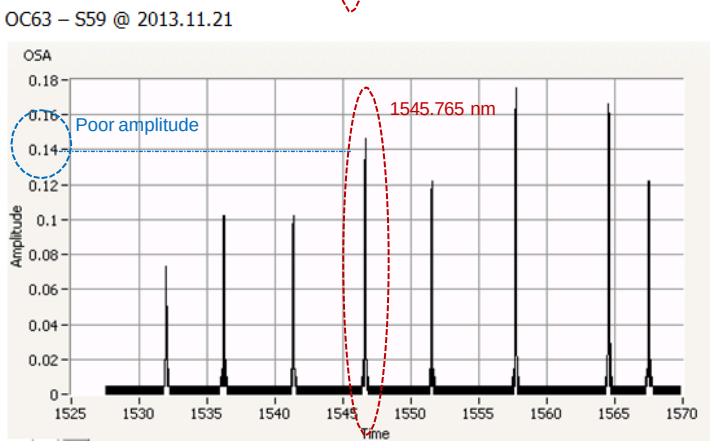
Challenges of SHM

- Long periods of operation

OPTICAL TECHNOLOGY





Wavelength

Insensitive to losses

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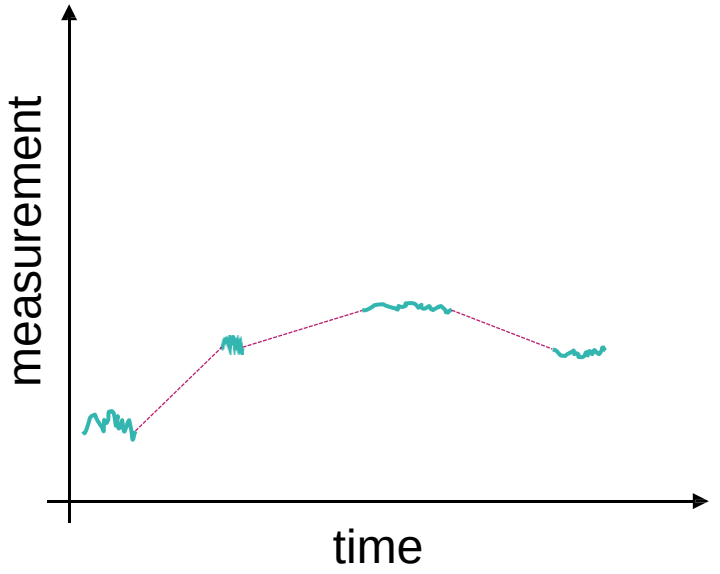
Challenges of SHM

- Referenced measurements

OPTICAL TECHNOLOGY



Wavelength

Absolute

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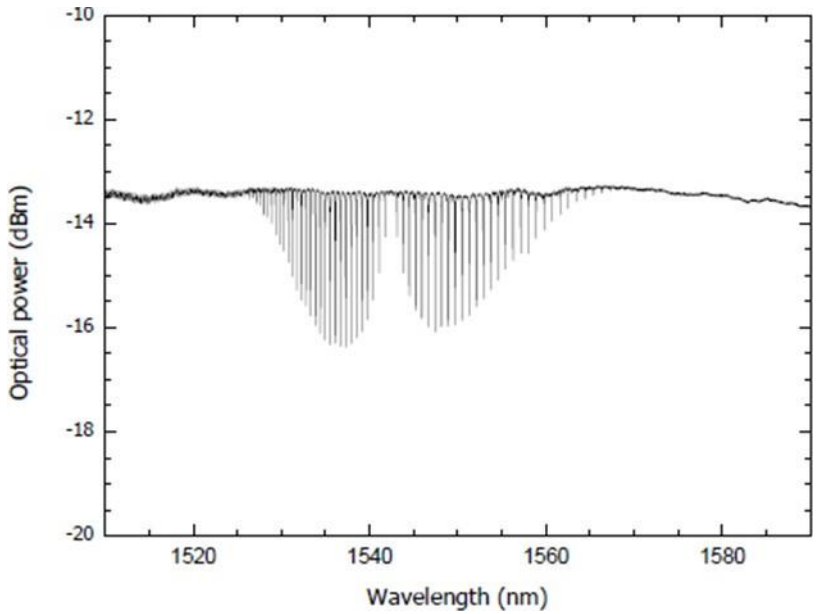
Challenges of SHM

- Trusted measurements

OPTICAL TECHNOLOGY

Interrogators with built-in reference → No Drift



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Challenges of SHM

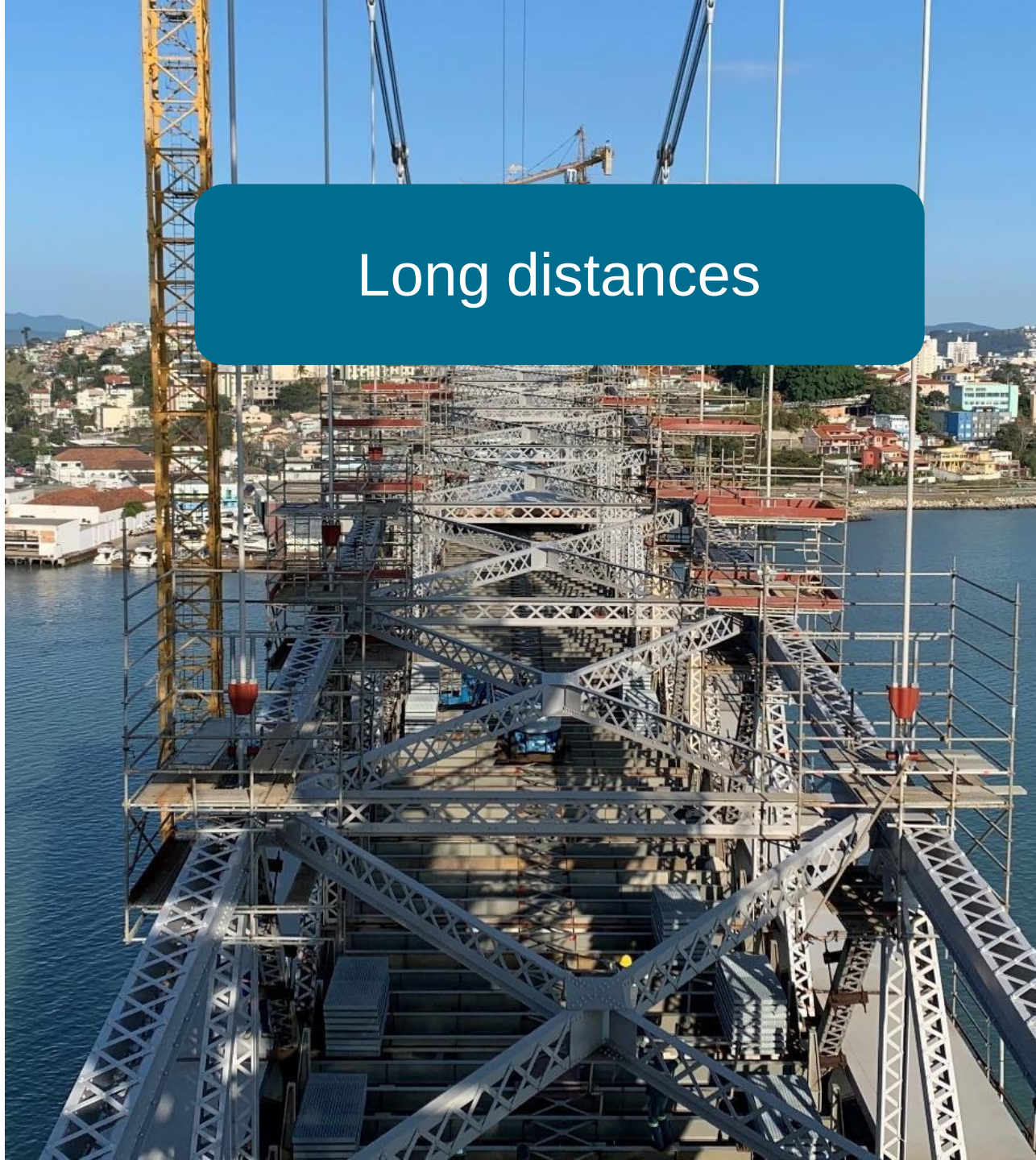
- Harsh Environments

Challenges of SHM

- Signal transmission

  OPTICAL TECHNOLOGY

Data acquisition system installed far from sensors



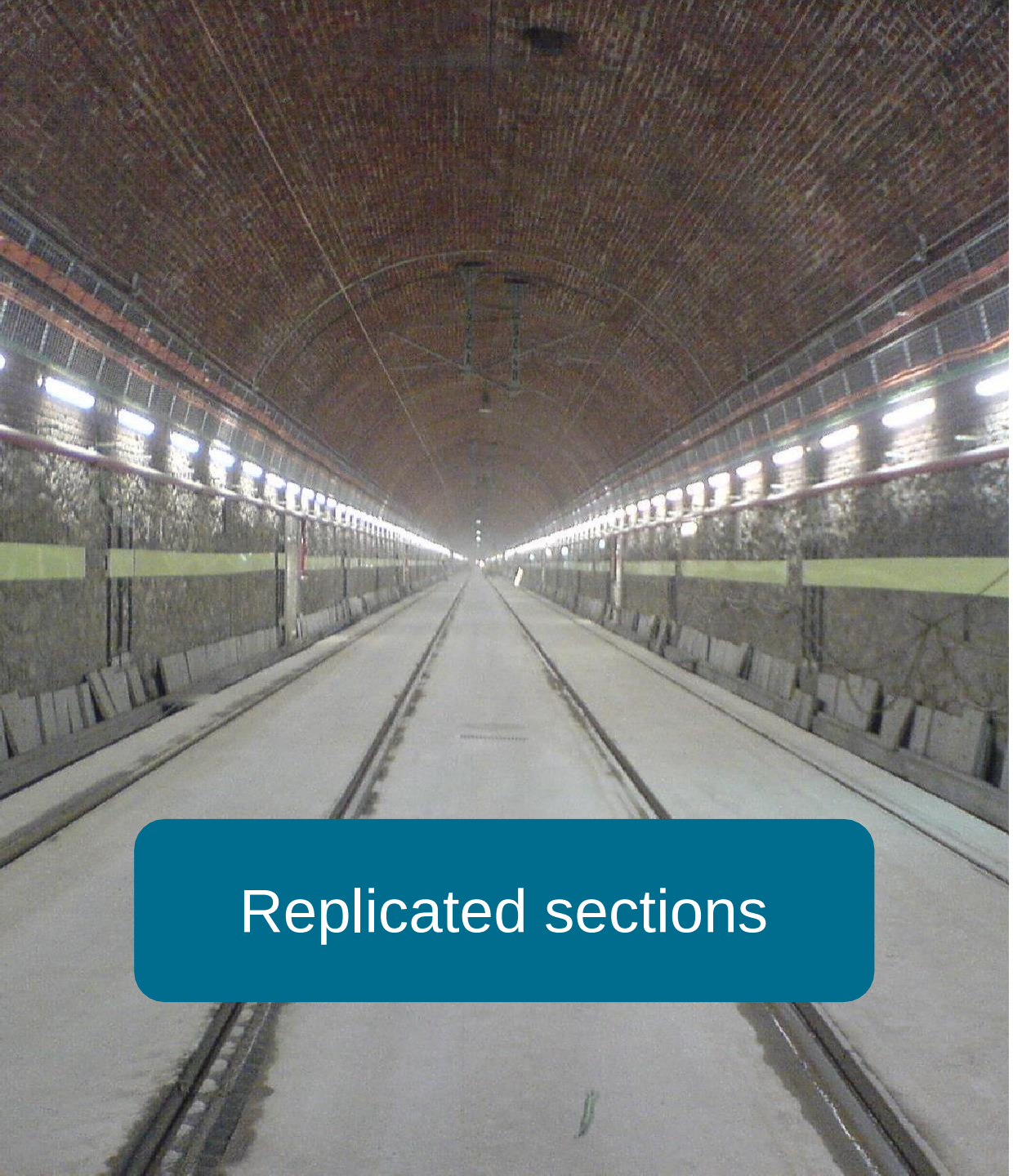
Challenges of SHM

- Signal transmission

  OPTICAL TECHNOLOGY

Low attenuation of the optical fibers

Long distances



Challenges of SHM

- Large sensor count

OPTICAL TECHNOLOGY

Multiplexing

Multifunctionality

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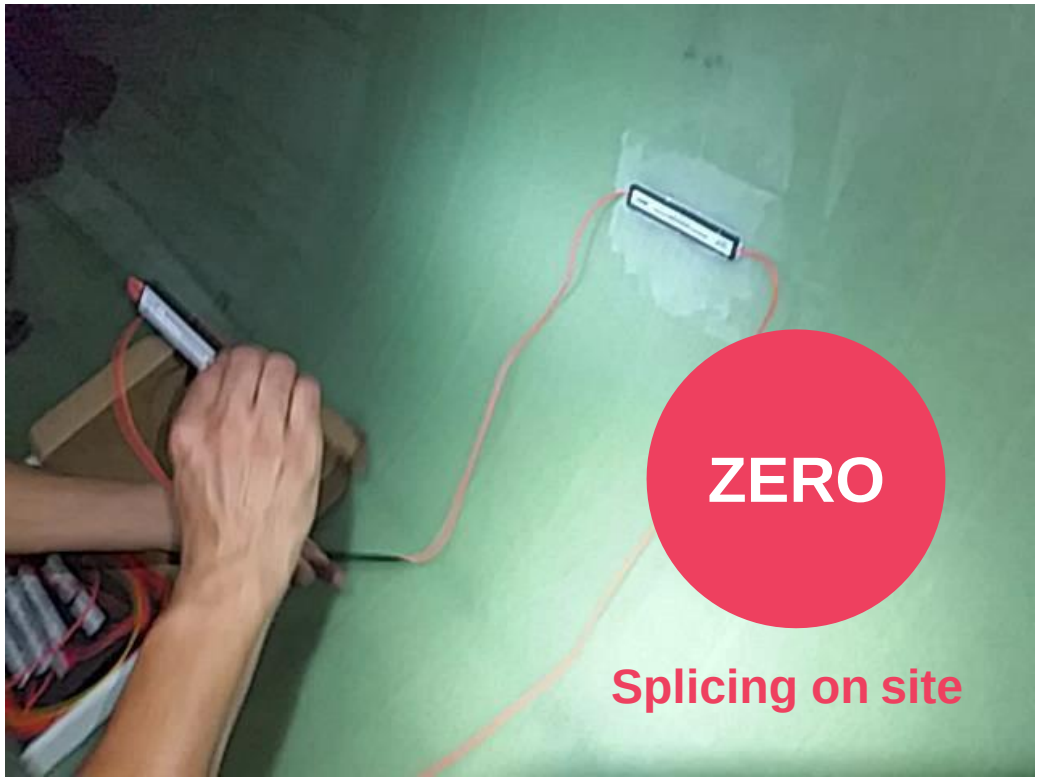
32
Conventional sensors
128
Wires
45
FBG sensors
4
Wires

Challenges of SHM

- Installation efficiency

OPTICAL TECHNOLOGY

Preassembled arrays of sensors



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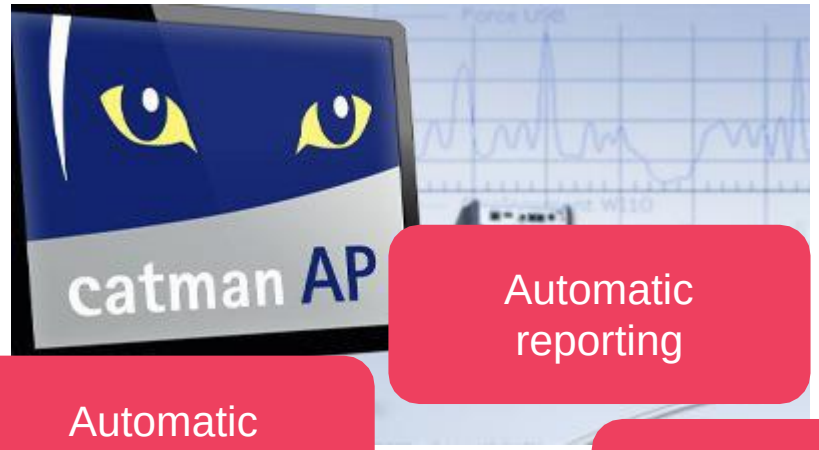
Challenges of SHM

- Data management

OPTICAL TECHNOLOGY

Catman software



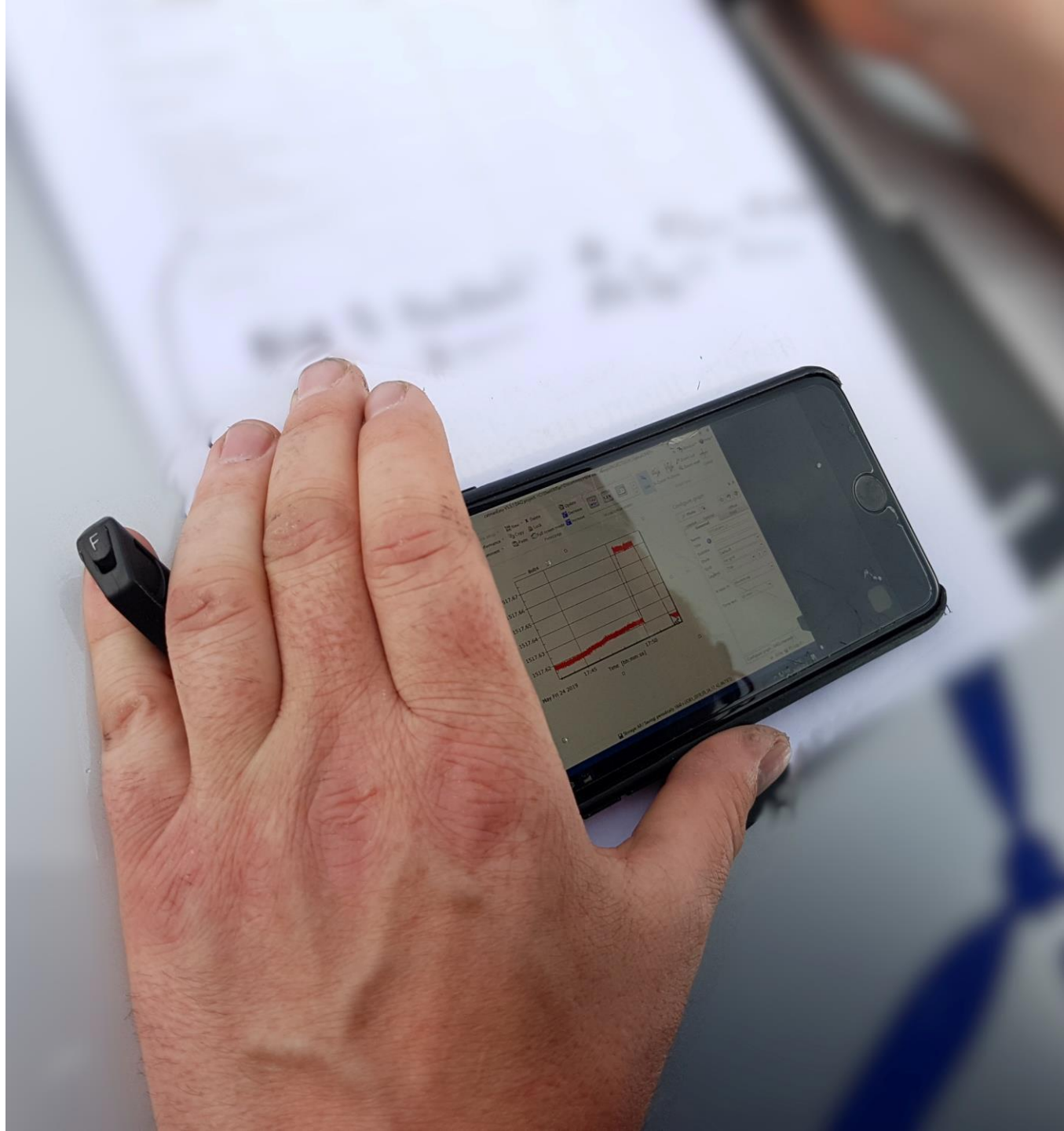
Automatic reporting

Automatic processing

Alarming

Cloud

Data centers



Challenges of SHM

- Cost Effective

DURABLE

STABLE

RELIABLE

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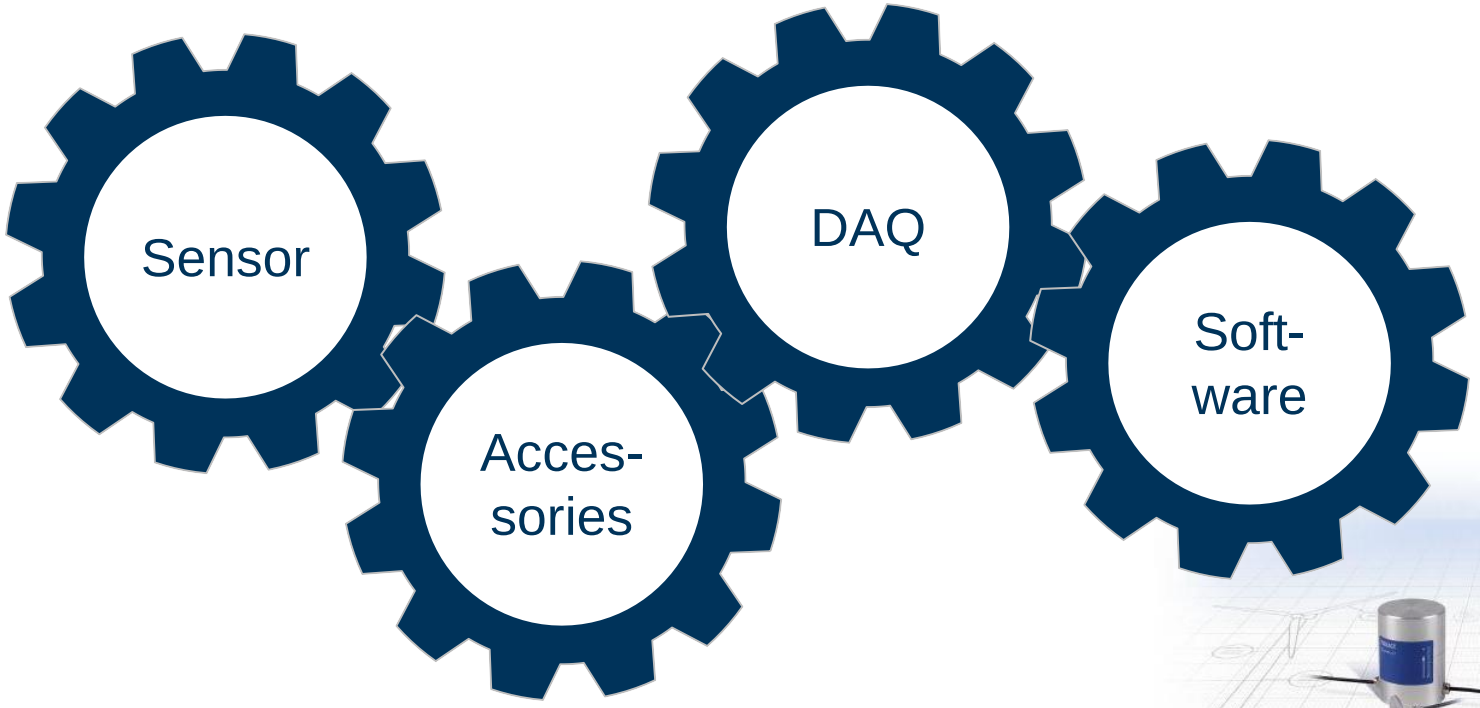
Challenges of SHM

- Cost Effective



FULL MEASUREMENT CHAIN

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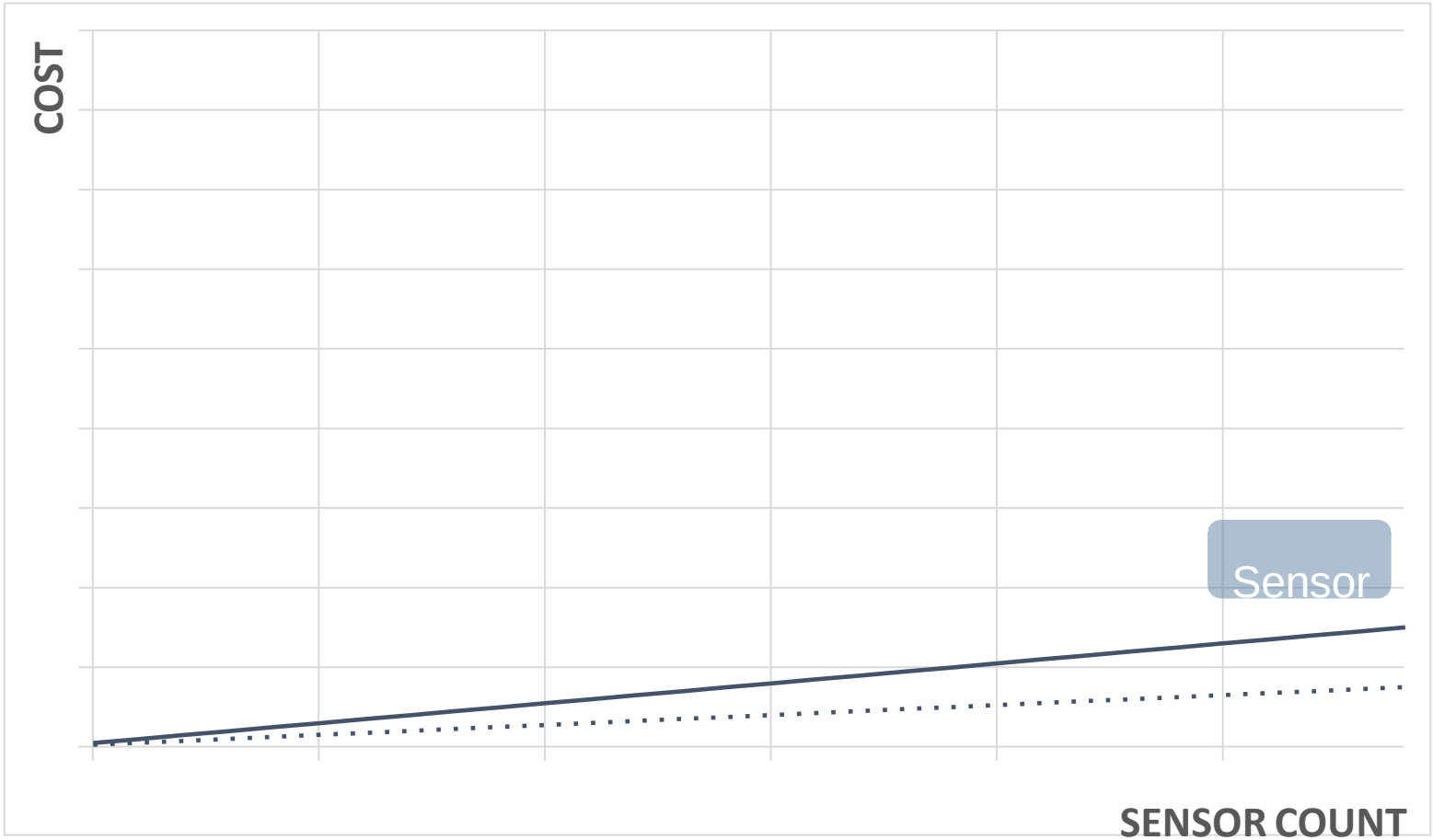
Challenges of SHM

- Cost Effective



TECHNOLOGY:

- Conventional
- Optical

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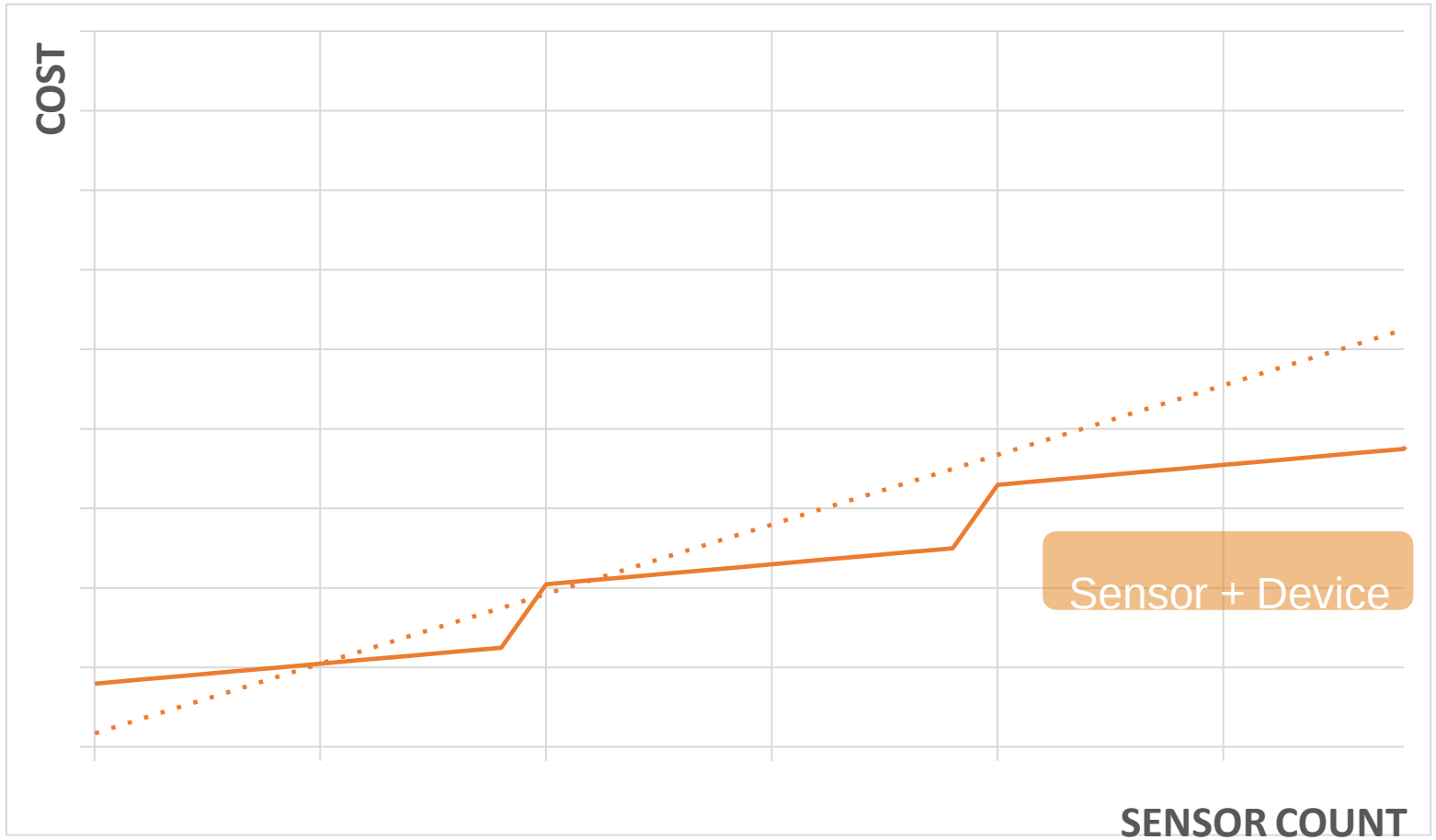
Challenges of SHM

- Cost Effective



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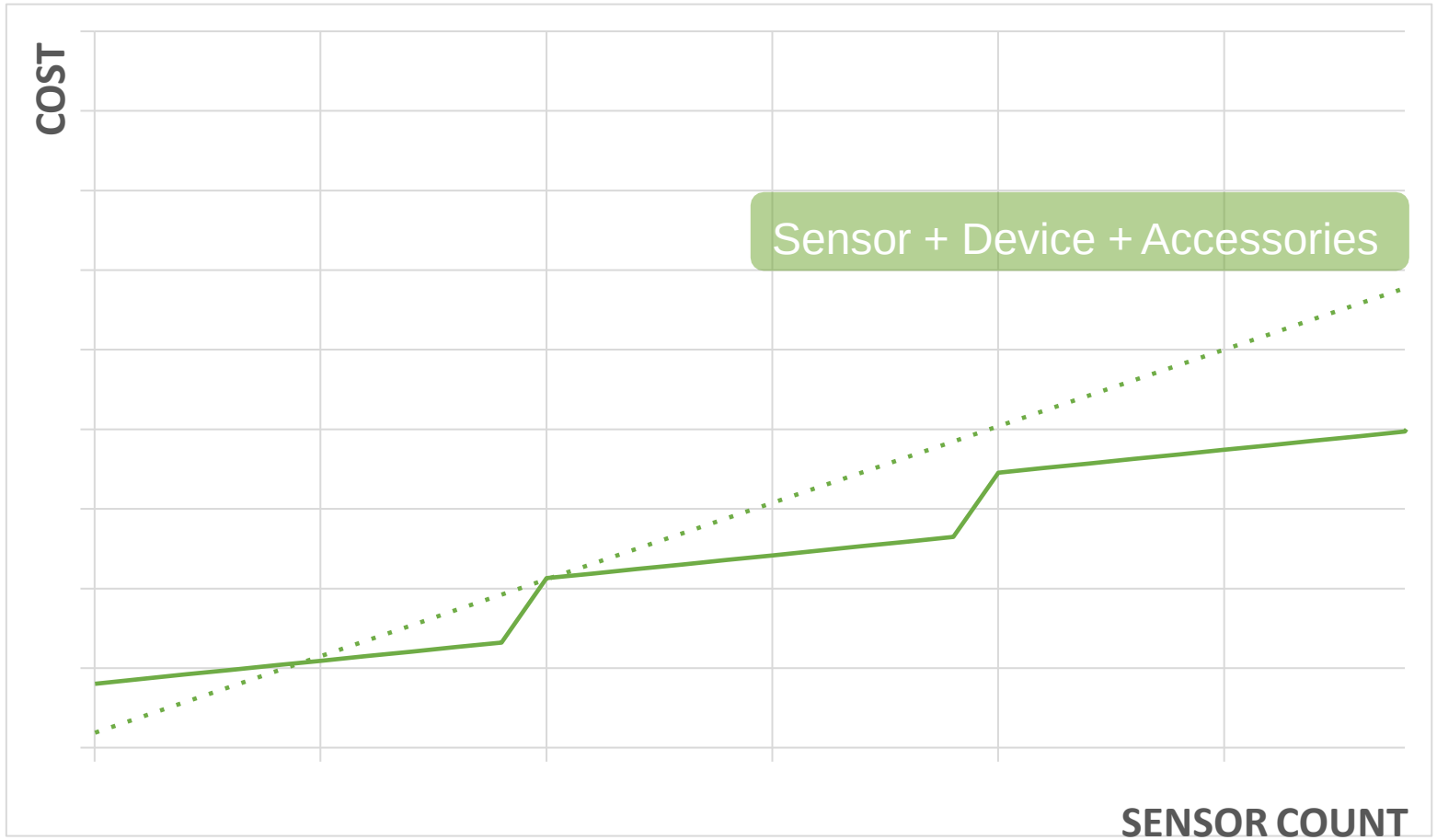

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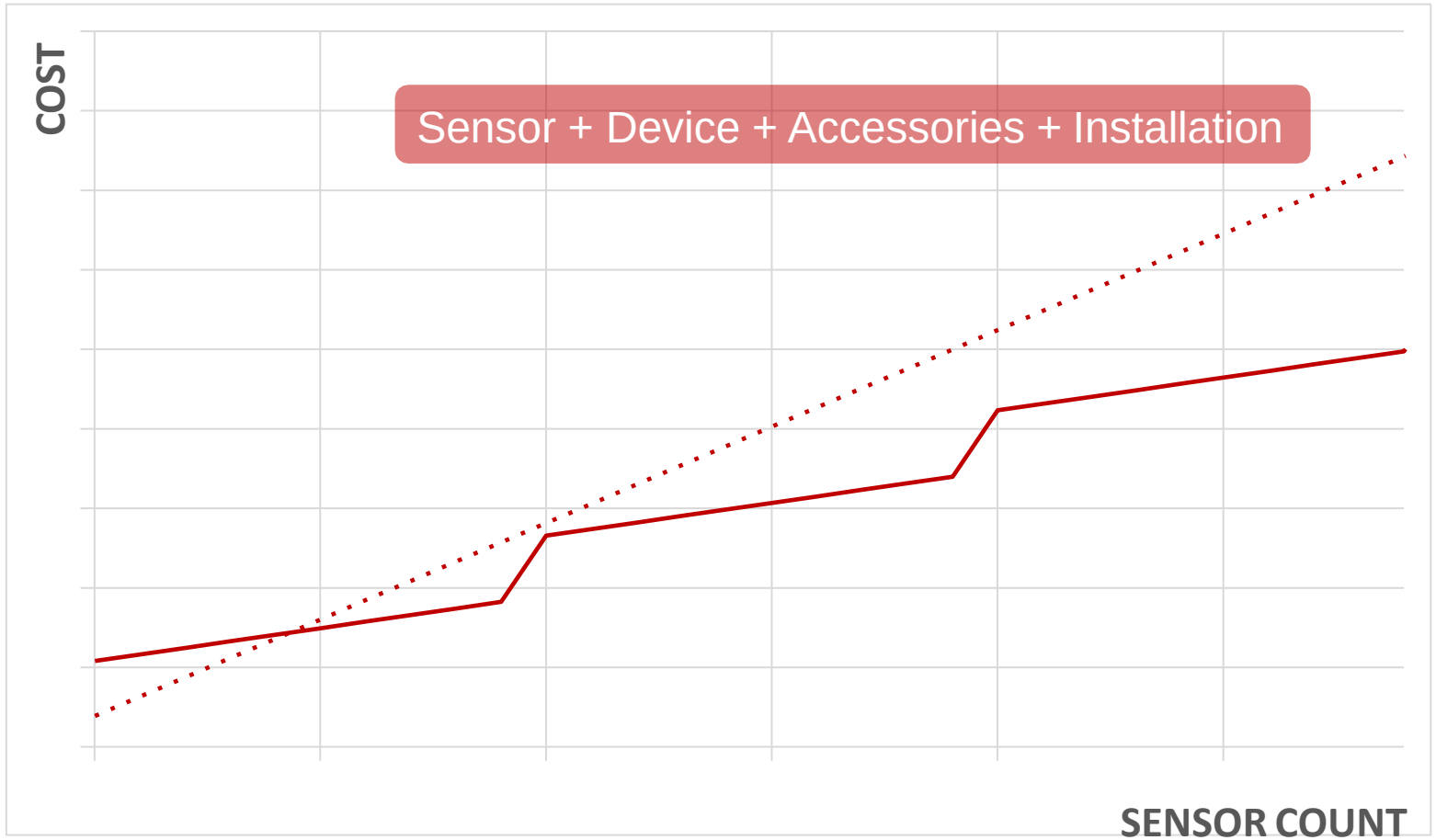

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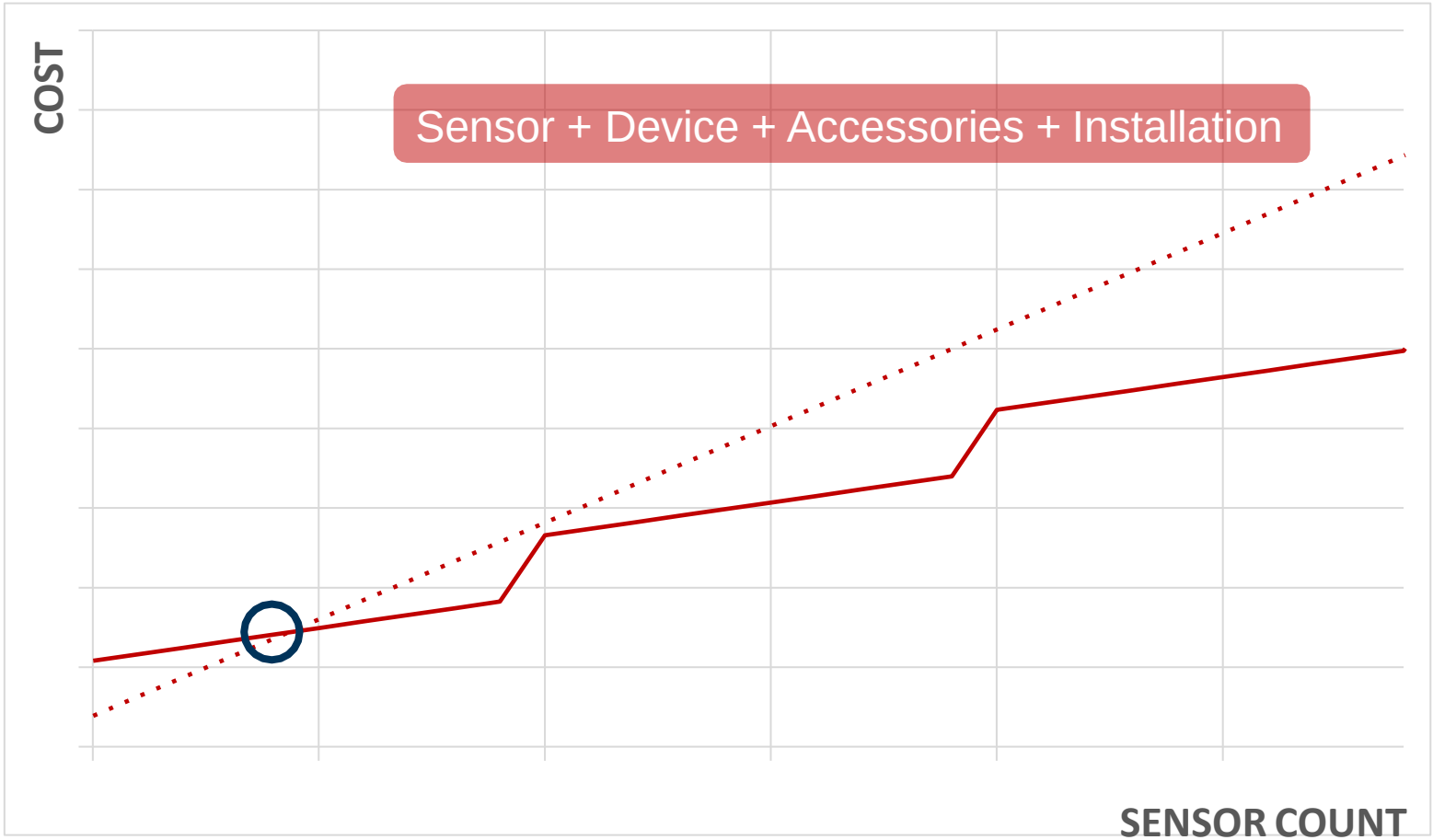

TECHNOLOGY:

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Challenges of SHM

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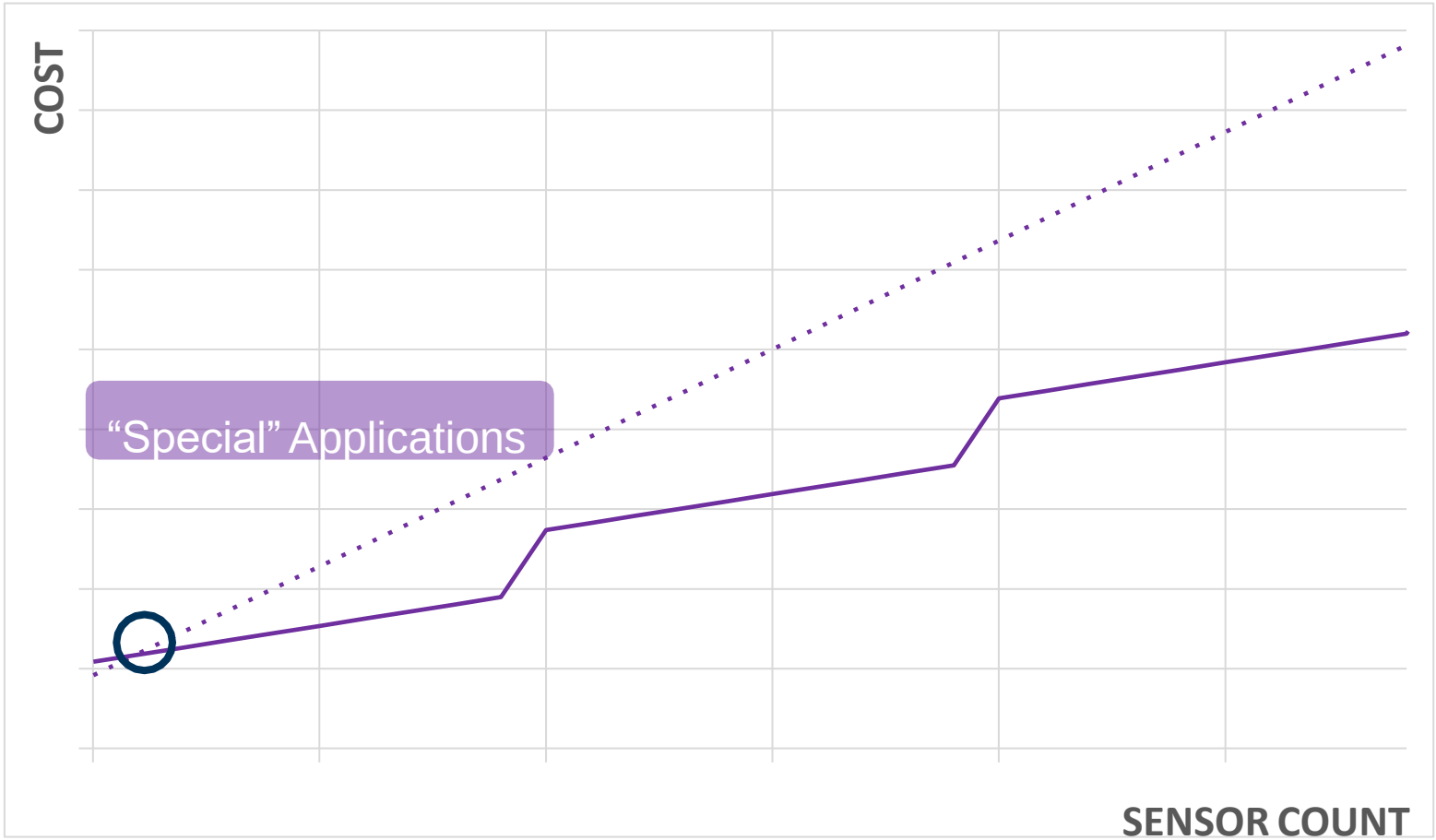

TECHNOLOGY:

- Conventional
- Optical

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Hybrid concept

THE BEST OF BOTH WORLDS

Hybrid concept

- Using conventional and optical technology combined

Optical

Electrical

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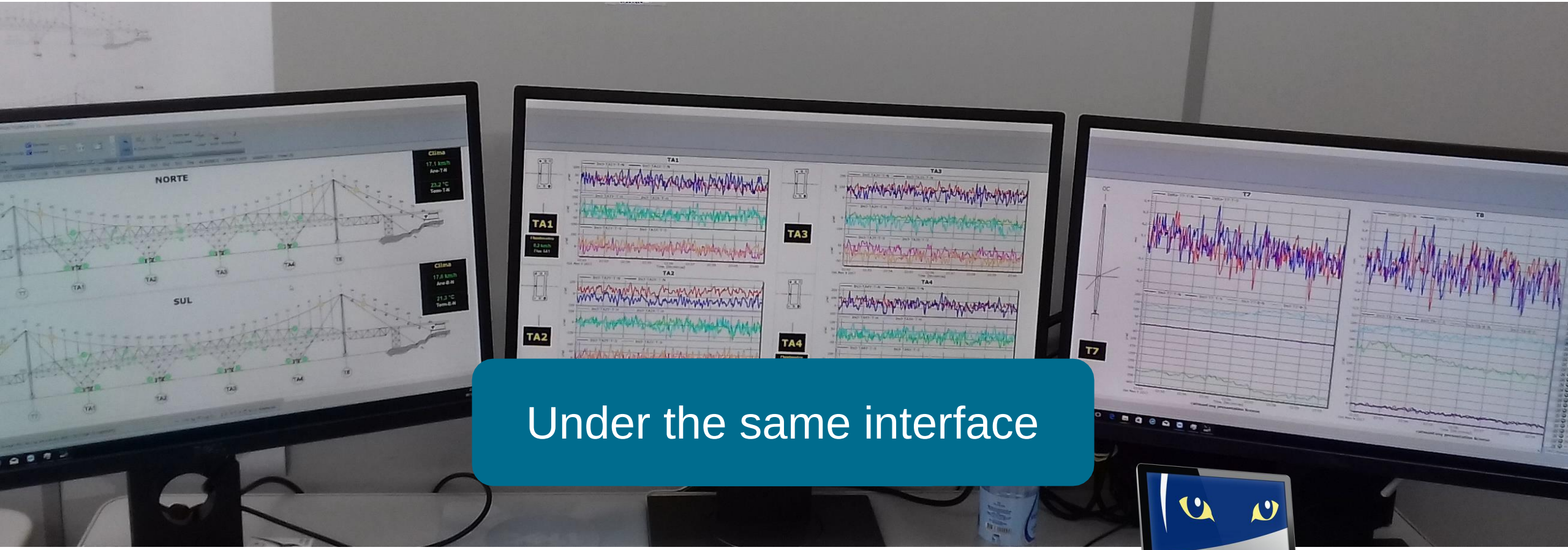
Hybrid concept

- Using conventional and optical technology combined



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Hybrid concept

- Using conventional and optical technology combined

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Great news are coming !!!

The new MXFS

- BraggMETER
  - 100 nm wavelength range
  - 8 optical connectors; 16 channels per connector

    128 Sensors

  - Two sample rate modes

    100S/s

    2000S/s

  - Smart Peak Detection

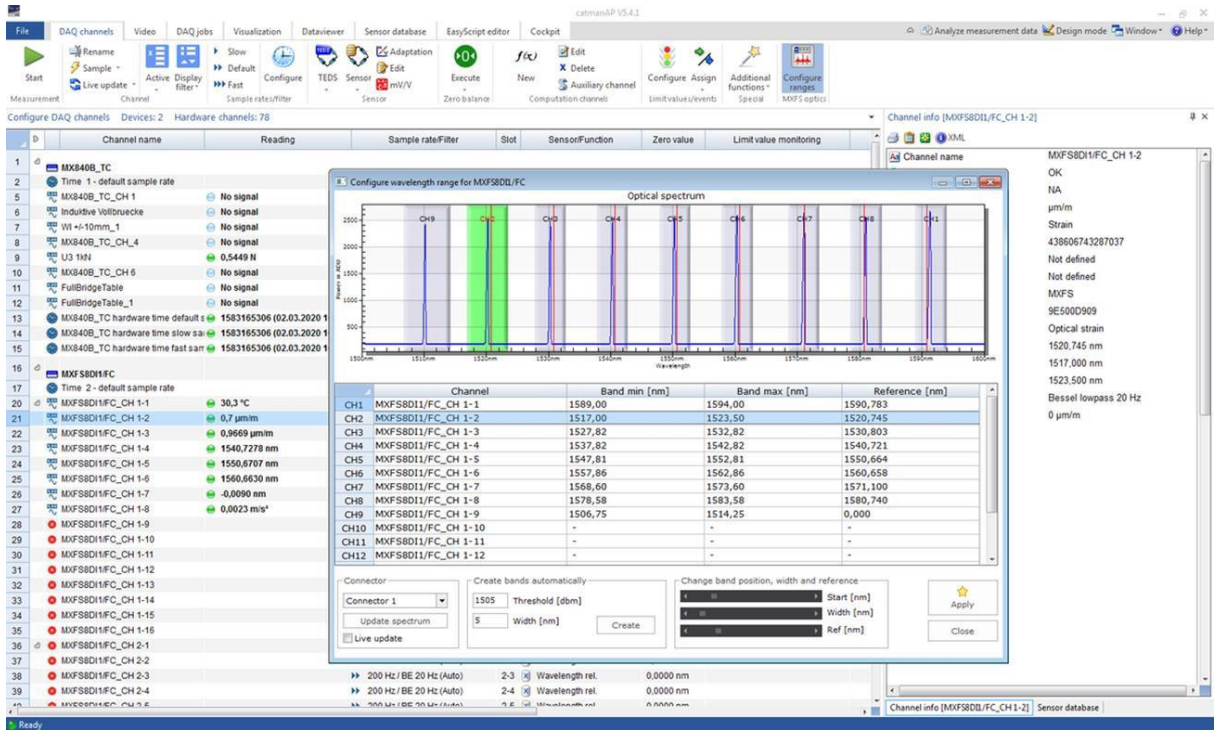
    SPD

The new MXFS

- QuantumX
  - Reduced size and weight
    - 2 Kg
    - 174 x 88 x 135 mm
  - Scalable
    - Ethernet
    - FireWire
    - Backplane
    - Analog
    - CAN
  - Synchronization
    - NTP
    - PTPv2

The new MXFS

- Catman Software



The new MXFS

Precise

Stable

Integrable

For Successful Structural Health Monitoring Projects

Thank You

Danilo Ginez – Sales Department
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