fischer

Connected Products
Construction Monitoring



Building the future

Old Challenges…

Applications with increased
security requirements

Applications with increased
inspection & maintenance requirements

Applications with focus on
Improved service life instead of new construction





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Resource-intensive inspection and maintenance activities by the operators lead to huge efforts and high costs



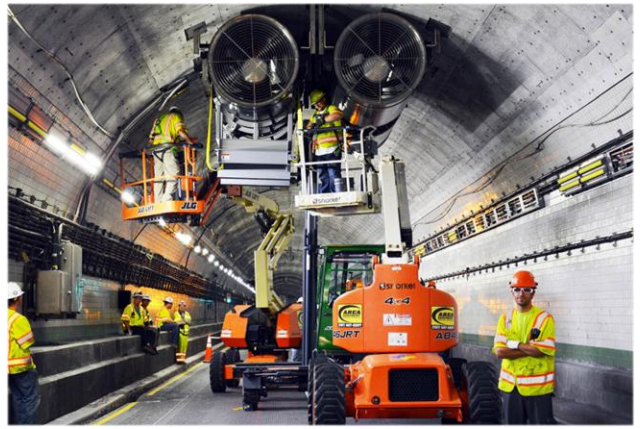
Cable cars

The use of **industrial climbers** in the mountains is costly and dangerous for the operator.



Wind power

Access often only possible by **helicopter**. Annual costs for bolt maintenance of 50.000 $ per turbine.



Tunnel fans

Dismantling the fan to monitor bolt connections leads to long **lane closures**.

Customer need is apparent → good market fit

Building the future
New Solutions.

Applications with increased
security requirements

Applications with increased
inspection & maintenance requirements

Applications with focus on
Improved service life instead of new construction

fischer +

Digitalization

=



Structural Health Monitoring

Building the future

Old challenges, New Solutions.







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fischer

+

Digitalization

=





Structural Health Monitoring

Automatisation on Construction sites

Robotics solution

Applications with increased

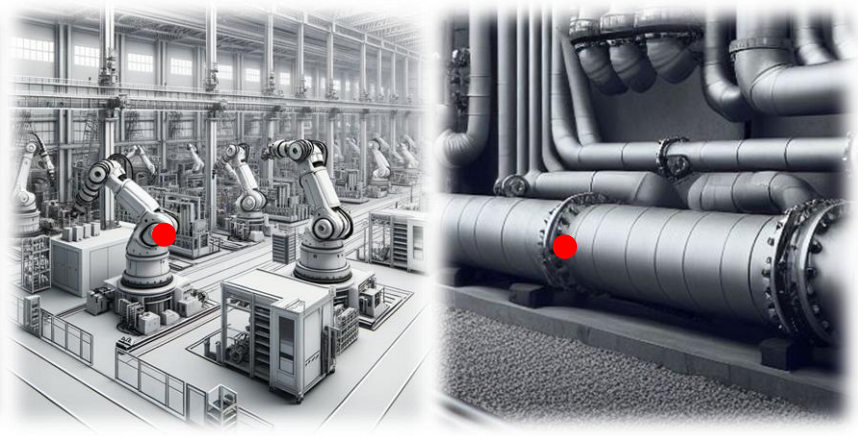
Inspection & Maintenance requirements



Infrastucture & Transportation



Energy & Off-Shore

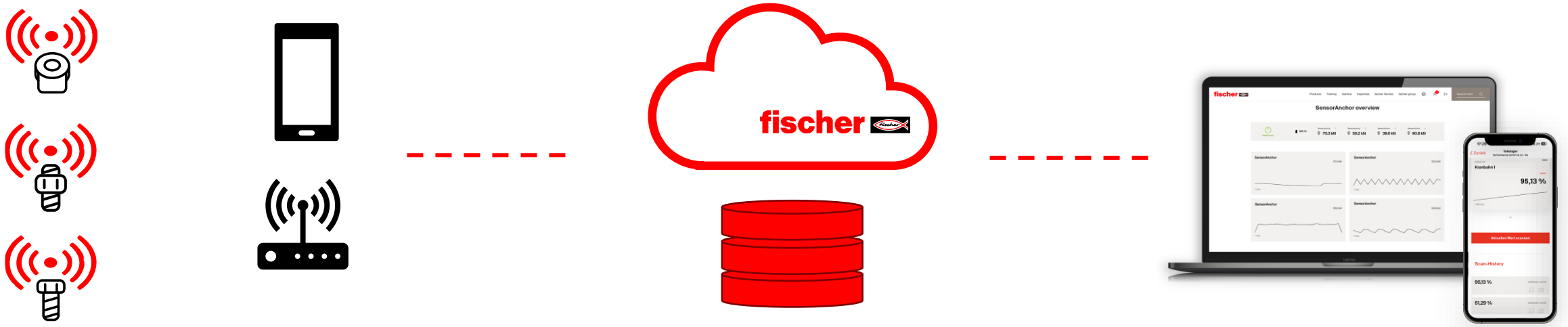


Industry & Process Engineering

Structural Health Monitoring

- **Avoidance** of catastrophic failures
- **Extended** service life of structures
- **Minimization of** downtime and maintenance times
- **Cost-efficient and reliable** inspections
- **Improvement** future structures
- **Attractive** insurance models

With Construction Monitoring, maintenance costs can be drastically reduced while safety remains the same.



Sensors Data transmission

Detection of data using sensors on the structures and data transmission

+

Data storage & processing

Data storage in the fischer Cloud and data processing using algorithms

+

Customer application & Dashboard

Data presentation and data analysis via fischer Construction Monitoring

SensorDisc.
Digital add-on for bolted connections.

- Simple and flexible handling
- NFC technology enables battery-free operation
- Reading out the percentage forces via smartphone



- Up to strength class 6.8 (A4-70)
- Applications in industry & infrastructure

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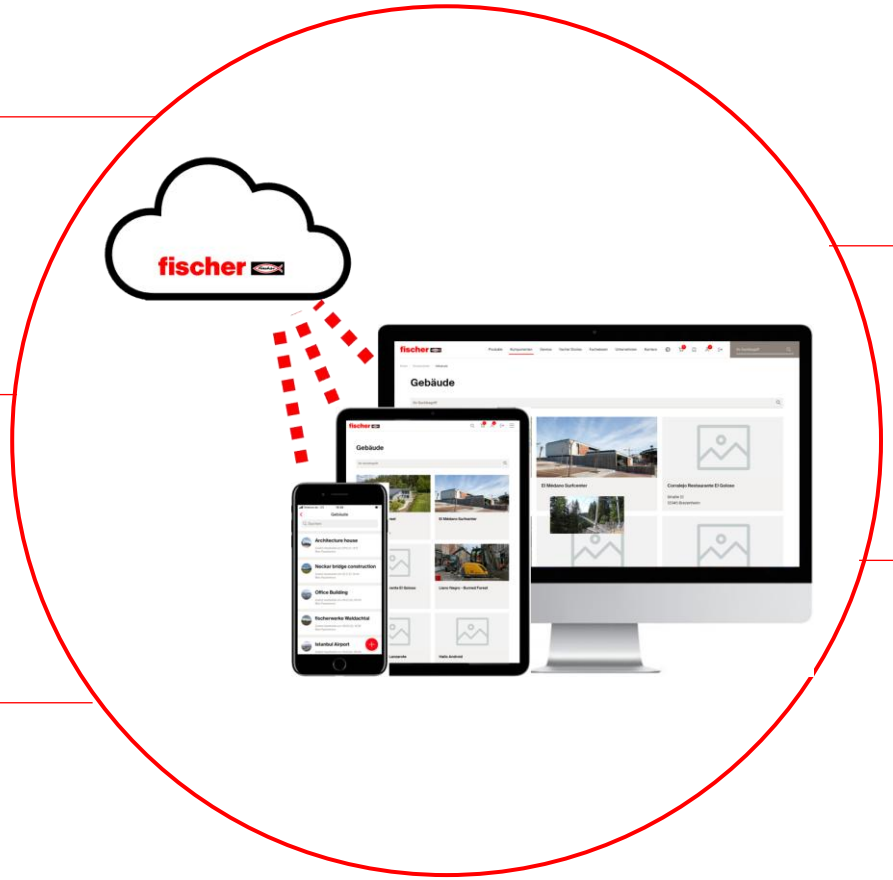
Construction Monitoring.

Cross-platform cloud module from fischer.

Central contact point for our customers

All digital applications on one platform

Available as a mobile app (fischer PRO) and web application



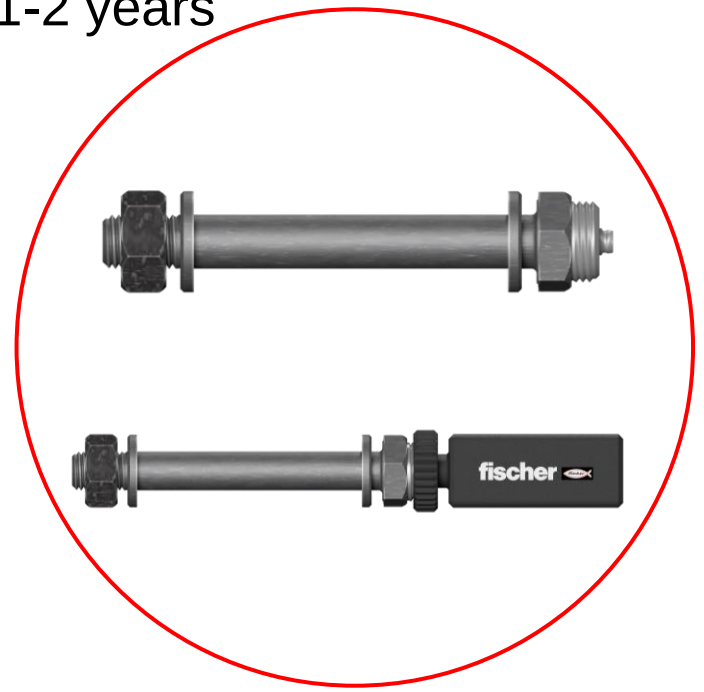
Interfaces to other systems possible

Centralized user and device management for customers

SensorBolt.

Remote monitoring of high-strength screws.

- Modular LoRa WAN transmission module with a battery life of 1-2 years
- Absolute force measurement with an accuracy of ± 5%
- Remote monitoring via central gateways
- Transmission module enables local wireless data transmission

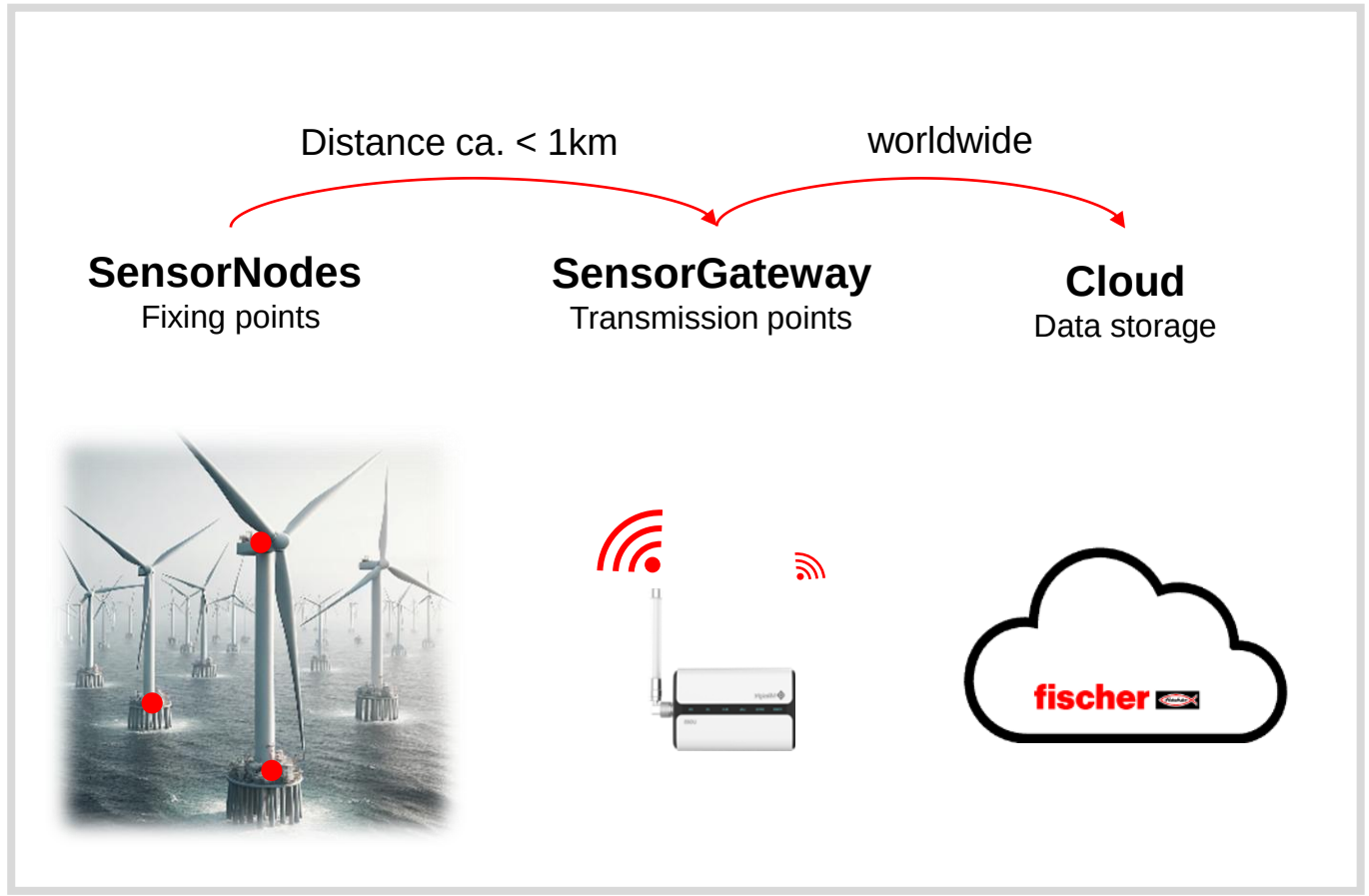


- Strength class **10.9 / 12.9**
- Applications for steel-steel-connection in structural steelwork

SensorNetwork.
Distributed measurement, centralised transmission.

Short/medium distance transmission **long-distance transmission**

- **Two-stage transmission concept**
  - Sensors are equipped with **wireless transmission modules**
  - Gateway manages multiple sensors and sends aggregated data to cloud storage
  - Combination of **short, medium and long-distance transmission**
- **Flexible sensor technology**
  - Adaptation to fischer sensor products
  - Integration of additional sensors



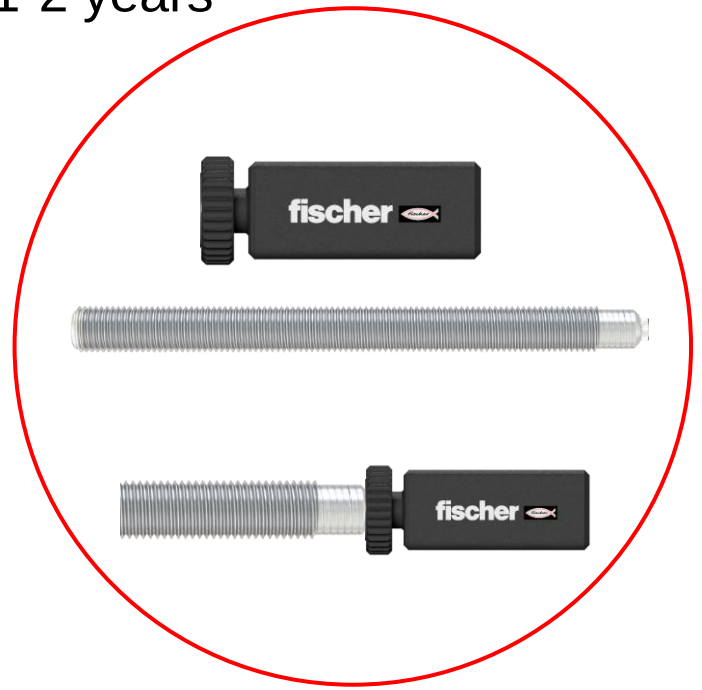
SensorAnchor.

Combined monitoring and fastening device.





- Modular LoRa WAN transmission module with a battery life of 1-2 years
- Absolute force measurement with an accuracy of ± 10%
- Remote monitoring via central gateways
- Transmission module enables local wireless data transmission



- Strength class **6.8 / A70**
- Applications for chemical fasteners

SensorBolt and SensorAnchor.

What we offer during pilot phase.



SensorBolt and radio transmission module in MVP stage
We are offering you a small number of sensor-integrated fasteners and transmission modules for a limited period to test the basic functionality of such a complete system in the field.



Cloud module and data preparation
At this stage of the project, the data is stored via a fischer-internal cloud module and prepared graphically for you.



Connection to a LoRa WAN network
We support you in setting up a local LoRa WAN network using an IoT gateway.



Advice and support
During this project stage, we are on hand as experts to answer all your questions, help evaluate critical points and provide on-site support.



Cooperative collaboration
Ensure through cooperative collaboration that the SensorBolt is optimally equipped for your application in the future series.

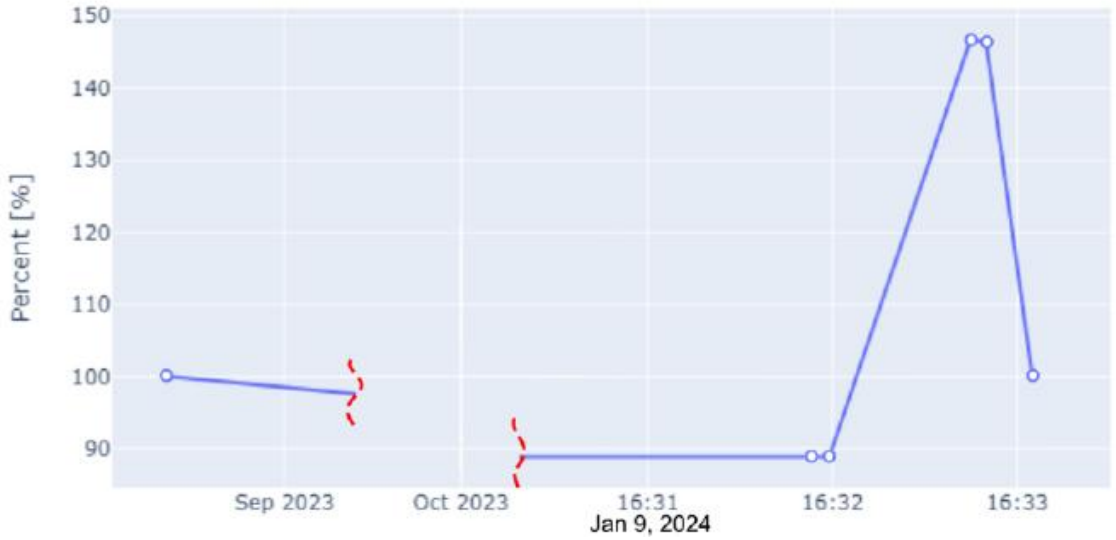
Case Study SensorDisc.

DolWin alpha helicopter platform.



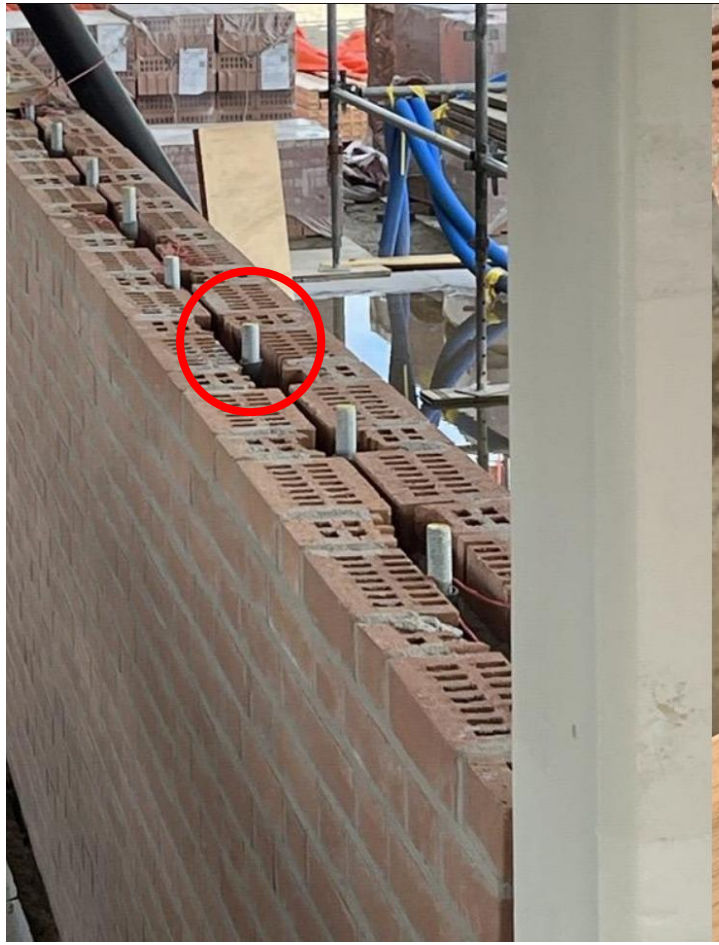






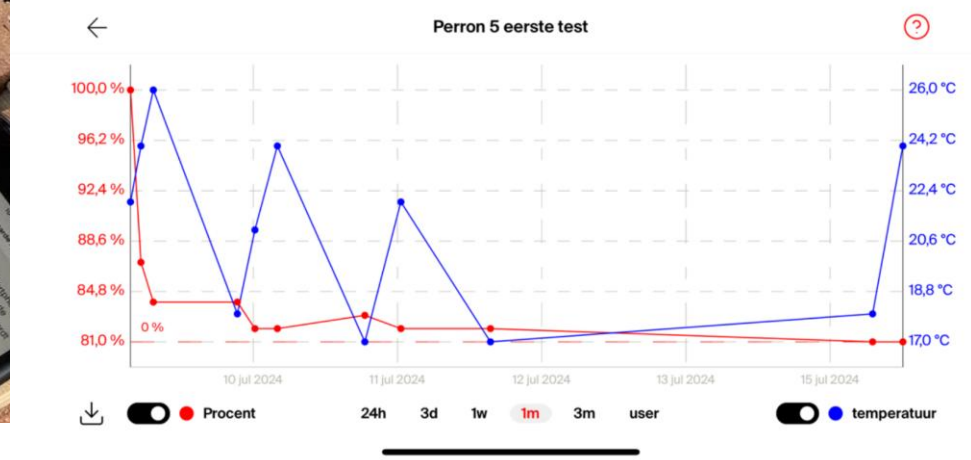
Case Study SensorDisc.

Monitoring of compressive forces in masonry

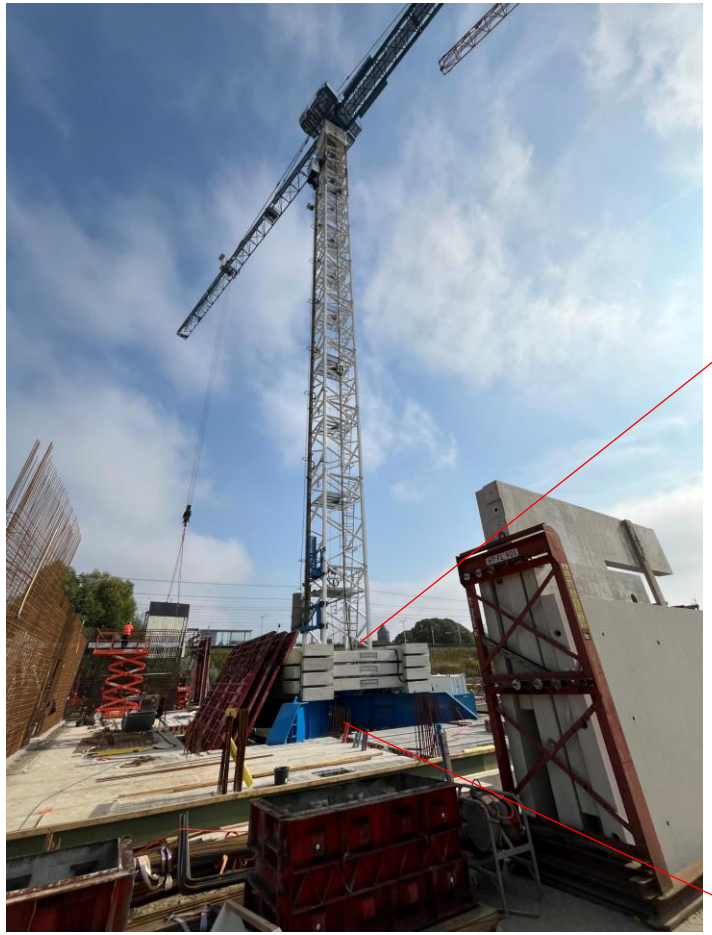




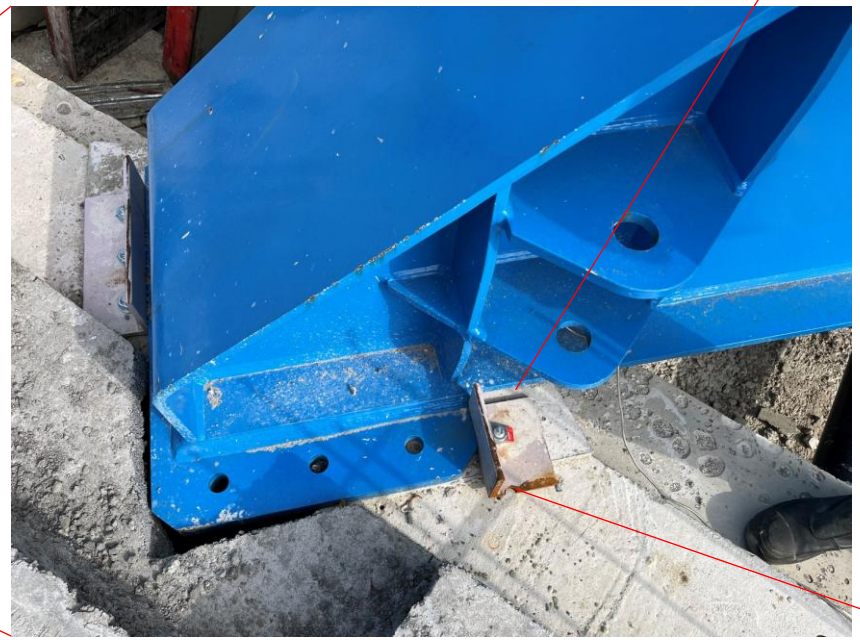




Case Study SensorDisc.
Monitoring of crane fixings



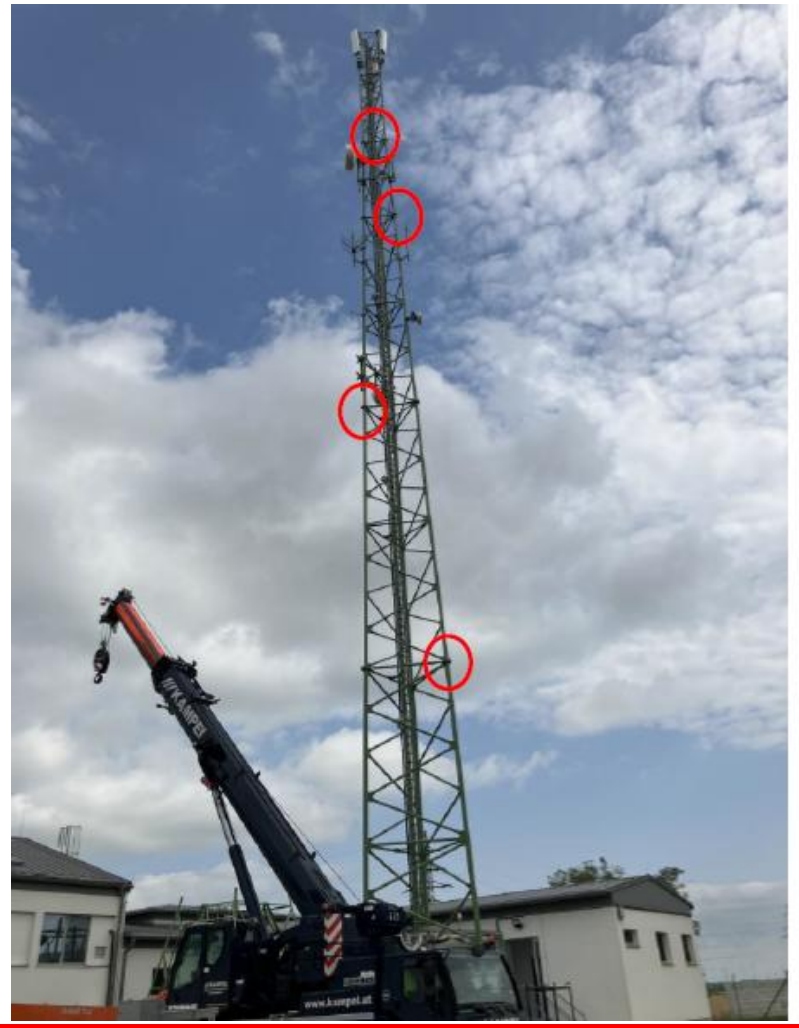
- Crane structure on construction site in the Netherlands
- Base point fastenings with FAZ.
- Use of the SensorDisc for monitoring





Case Study SensorBolt.

Remote monitoring of Radio Tower.





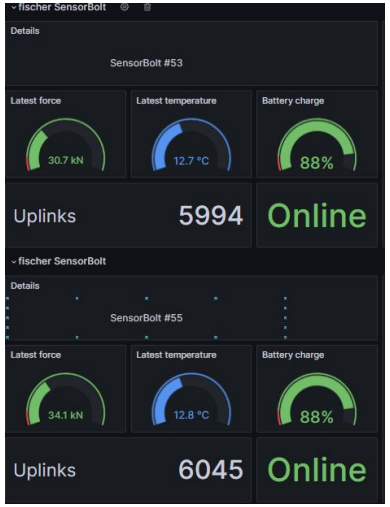


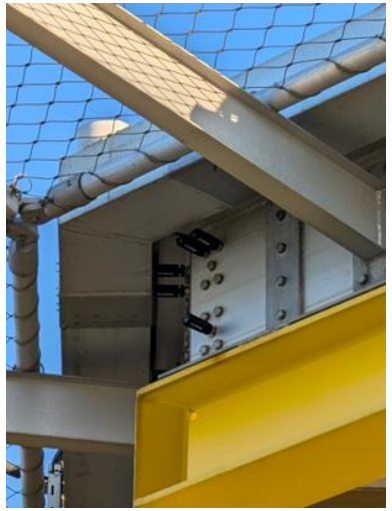


Case Study SensorBolt.

Off-Shore Helideck.









Stadtwerke München



Olympia Park

- Visitor platform with zip line rides
- Visitor platform needs to be inspected

➢ **8x HV SensorBolts with Node**





Further use cases:



Mannesmann Linepipe

- Production of pipes
- New production hall
- Monitoring static loads

➢ 10x HV-SensorBolt with SensorNode



Further use cases:







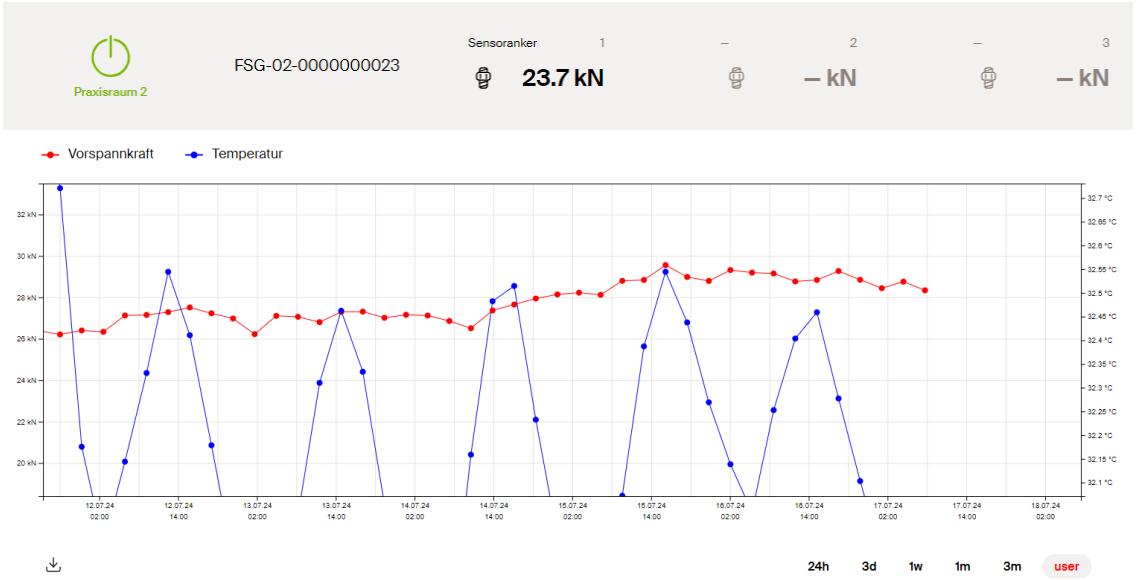
Case Study SensorAnchor.
Elevator shaft in Brazil.



Elevators in high-rise building broke down at the beginning of the year

SensorAnchor + SensorNode to be used as a measuring system in the course of renovation work.





The future is digital.

Let‘s shape it TOGETHER.

