Partner: ILT - Fraunhofer-Institut für Lasertechnik

DEMONSTRATOR FOR INTEGRATED SENSING TECHNOLOGY

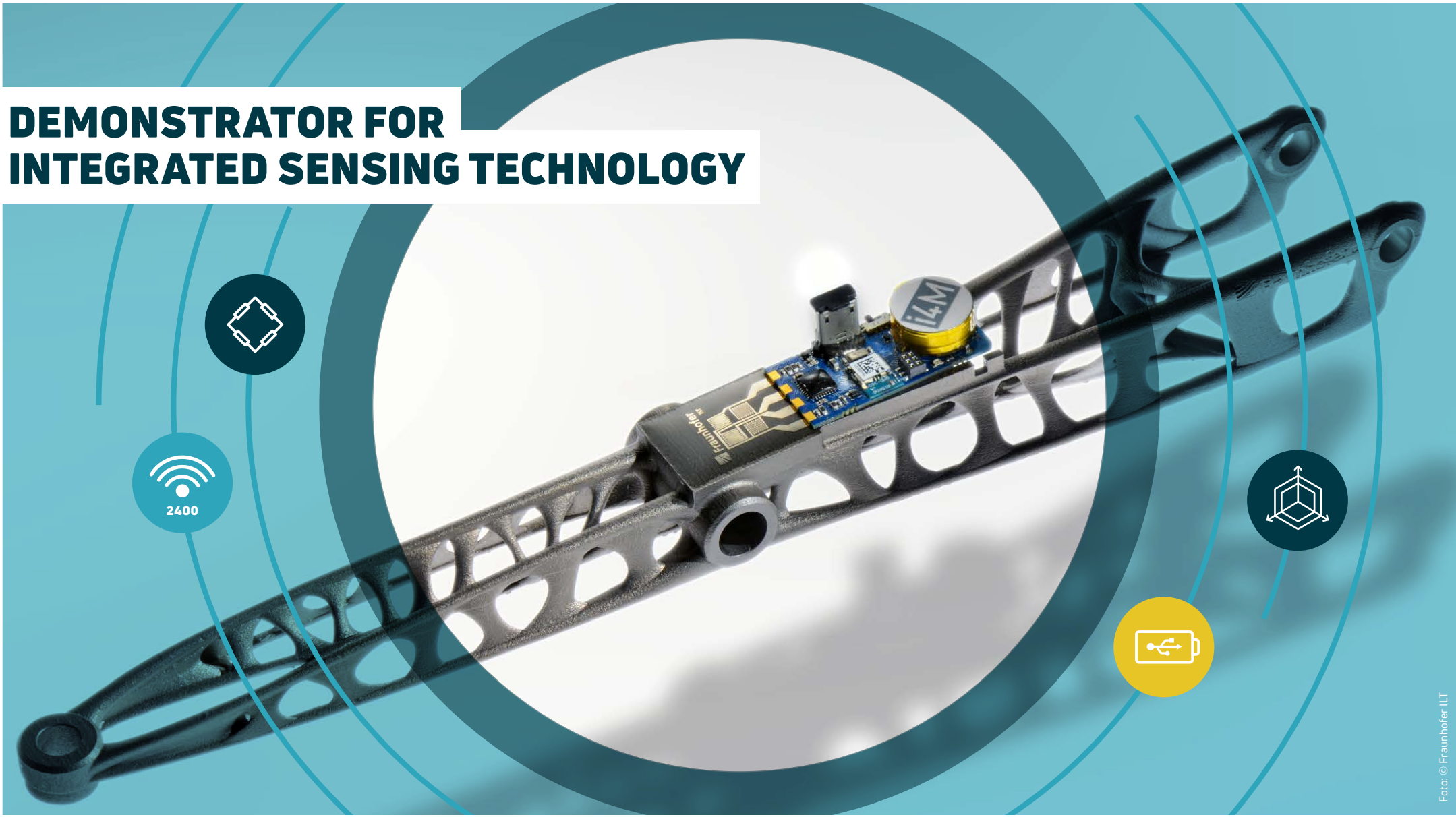

Foto: © Fraunhofer ILT

www.nemi.one

www.i4m-tech.de

i4M technologies GmbH
intelligence for mechanical systems

nemione
made by i4M technologies

Use Case Demonstrator for Integrated Sensing technology

Partner: ILT - Fraunhofer-Institut für Lasertechnik

OBJECTIVE

- Development of a demonstrator for a smart component using i4M's highly efficient telemetry and a direct connection of a 3D printed strain gage
- Collection of component condition data such as mechanical and thermal loads using highly integrated smart measurement technology to realize intelligent machine elements

PERIOD

- since 2019

CHALLENGES

- Small installation space
- Long battery life
- Direct connection of the 3D printed strain gages

REALIZATION

- Measuring system consisting of a transmitter module integrated in the component including battery and a receiver module for data acquisition
- Connection of a strain gage full bridge or a resistance thermometer to SMD pads directly on the transmitter module
- MEMS sensor technology integrated on the transmitter module for measuring accelerations and rotation rates
- Wireless data transmission with nemi Link 2400, i4M's radio technology in the 2.4 GHz frequency band, via integrated antenna to a receiver module nemi Connect
- Charging of the built-in battery via Micro USB cable
- Software for live data display for demonstration purposes at trade shows

ADVANTAGES

- Wide use of highly integrated measurement technology to measure component loads even in the smallest applications
- Highly efficient wireless measurement technology and long battery life due to robust radio technology nemi Link 2400
- Capability for edge computing on the transmitter module

PUBLICATIONS

- DMS-Sensoren aus dem 3D-Druck mit Low-Power-Funk-Telemetrie

  Rehberger, Matthias; Noll, Martin-Christopher | Elektronik Praxis, 17. Ausgabe 2020, 14.09.2020, S. 46-48

- 3D printing improves strain gauge sensor manufacturing

  Vedder, Christian; Noll, Martin-Christopher; Rehberger, Matthias | LaserFocusWorld, 21.04.2021

www.nemi.one

www.i4m-tech.de