Brockmann & Büchner

Increasing Availability and Safety of Railway Operation: When Old and New Technologies Meet

- *Technology Focus: Condition-Based Monitoring*

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The Potential of CBM

Over the past year, extensive discussions surrounding condition-based monitoring (CBM) for rail systems, parts, and components have taken place with various stakeholders, including operators, leasing companies, suppliers, developers, project managers, and consultants. These engagements have revealed that CBM serves as a fundamental stepping-stone towards further digitization and automation in railway operations, resulting in a rapidly expanding field that gives rise to entirely new business models. The abundance of technologies and methods available for data acquisition and processing underpins the diversity of these business models.

To monitor the health and performance of systems and components, sophisticated hardware like smart sensors is deployed to record crucial parameters such as vibration, pressure, force, dimensions, and temperature. In specific use cases, cameras may be employed to capture image and video data. Subsequently, various advanced technologies, such as acoustic noise and ultrasound analysis, laser-based systems, RFID and ground radar, and current or voltage analysis, are utilized to analyze the recorded data. These versatile technologies play a pivotal role in gathering data from diverse systems and parts, making them the most widely applied.

Moreover, certain cases call for measurements of parameters like speed, air pressure, and even oil quality to obtain a more comprehensive and precise assessment of an asset's health.

Temperature measurement, for instance, offers valuable insights into the condition of HVAC systems, highlighting potential defects in control and monitoring electronics, compressors, or batteries, as well as advising on issues like inadequate lubrication, sanding, or oiling of bogies and chassis. Additionally, monitoring temperature can help detect wear on wheelsets or axle bearings and identify friction brake defects. Measurements of acceleration and audible acoustics aid in identifying problematic conditions in bogies, wheels, and, when monitored in the passenger compartment, they can alert to impaired ride comfort. Furthermore, such techniques can provide early indicators of issues like

shelling or spalling, as well as ripples or Belgrospi on rails.

These advanced monitoring techniques present invaluable tools for ensuring the reliability, safety, and efficiency of rail systems, components, and overall operations. By embracing and integrating such technology, the rail industry can continue to make significant strides towards enhanced performance and an improved passenger experience.

Digital Services of Railmonitor

Danish startup, Railmonitor, has developed a selection of Digital Services, providing infrastructure owners, operators, and contractors insight into the condition of their track. Railmonitors Digital Services connects various data sources with geoinformation or asset management systems and flags up abnormalities. These services enable users to analyze data and visualize results from track bed monitoring, switch condition monitoring as well as structural monitoring.

Thereby Railmonitor enables its clients to foresee potential failures before they occur, facilitating the optimization of maintenance strategies and significantly enhancing safety. With Railmonitor's innovative approach, predictive maintenance becomes a reality, minimizing downtime and maximizing operational efficiency. These advancements mark a critical step towards revolutionizing the rail industry, driving it towards a more proactive and technologically driven future.

Railmonitor

The Danish startup has developed a selection of digital solutions that enable their clients to make informed decisions about the condition of their track or railway (close to their construction) and deliver safe, efficient, and economical projects.

Their products TrackBed[360] and TrackSwitch[360] enable users to analyze data and visualize results from track bed monitoring, switch condition monitoring as well as structural monitoring. Through the Digital Service Platform, data can be sourced 24/7.
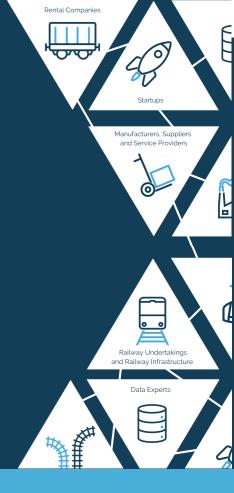
RAILMONITOR

https://railmonitor.dk/?lang=de

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Startups

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Railway Undertakings
and Railway Infrastructure

Data Experts

Rail Alliance – Shaping the Future

The concept of a Rail Alliance is a general success factor to exploit the full potential of the rail industry and solve the individual challenges of the market participants.

Triggered by possibilities of digitalization and recent trends, the rail sector is more and more taking on a new shape. The combination of numerous market participants and stakeholders is further increasing complexity.

If this sounds interesting to you - visit us on https://rail-alliance.network/