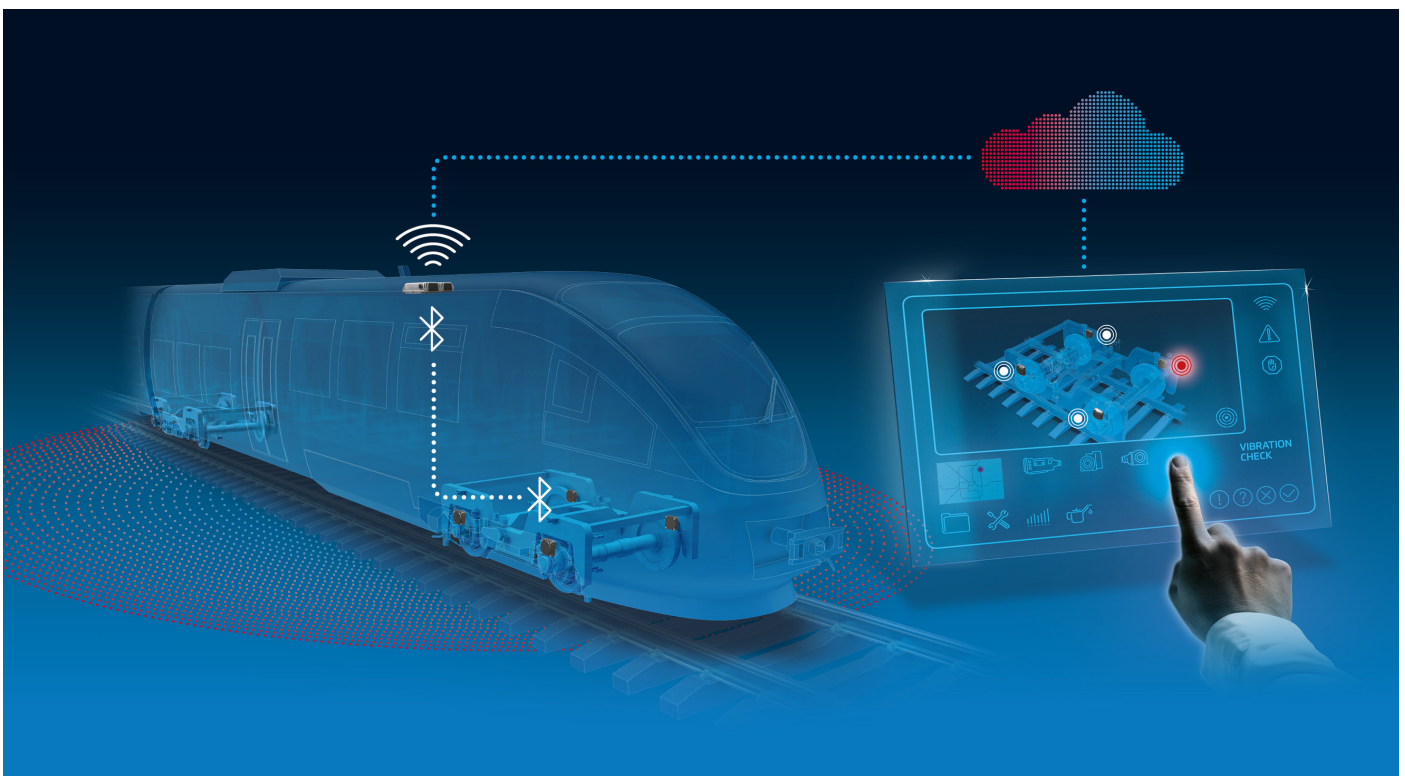


ZF Group

Keeping an Eye on Everything with ZF's connect@rail Solution



ZF's condition monitoring system connect@rail consists of sensors, gateways, cloud and dashboard

Reliability in rail transportation – be it cargo or people – is more important than ever.

Operators and manufacturers must keep downtimes to a minimum, safety and comfort at a maximum, and avoid failures at all cost. Fortunately, ZF is able to support companies with its smart and digital

connect@rail system for condition monitoring and maintenance management.

Smart. Thorough. Digital.

Connectivity and digitalisation have become an integral part of our everyday lives. The enormous quantities of information available everywhere and in real time make

new functions and business models possible that were unthinkable a few decades ago.

With connect@rail, ZF leverages its extensive expertise as a leading global company for driveline, chassis and safety technology. The system is a comprehensive and modular approach to fleet maintenance management and condition monitoring, with the

following components:

- Heavy Duty TAGs, battery-operated Bluetooth sensors that are placed on the vehicle bogies. There, they measure acceleration, vibrations and other parameters.
- Gateways, the VCU Pro Onboard Units, with CAN interfaces, several analogue input and digital output ports that supports Bluetooth, wifi and all common GNSS. The gateway is able to store and pre-process data gathered by the sensors.
- The ZF IoT Cloud, accessed via said secure onboard gateway, that uses the collected and enriched data to detect wear, damage and abnormality early and precisely.
- A dashboard for desktops and mobile devices that gives end-users a comprehensive overview of all parameters, reports, maintenance schedules and more.
- Digital typeplates with an integrated RFID chip that log actual installation position and hours of service of individual components. They both facilitate and keep records of scheduled maintenance.

With these hardware and software components, the connect@rail infrastructure and driveline monitoring system is able to monitor flat spots, wheel-tread wear, tracks and even driveline components. As it can be integrated and retrofitted into existing vehicle platforms and is not dependent on ZF-proprietary hardware, it offers manufacturers and fleet

operators an efficient way to reduce downtimes. Thus, it helps keeping public and cargo transport running efficiently.

Ecosystem

The modular connect@rail platform is a turnkey solution. ZF not only delivers the matching hardware, but also offers the required software, the advanced analytics and the associated platforms. If requested by the customer, more sensors, evaluations and monitoring functions can be added. ZF is also meeting the challenges of digitalisation by creating and implementing ecosystems, leading to shorter periods for market launch of innovative and tailored solutions that meet rapidly changing customer requirements.

The open, customer-specific software and hardware architecture of the connect@rail system allows the integration of partners into the ZF ecosystem.

The co-operation with DB Systemtechnik is one successful example of such an ecosystem partnership. In a joint project, ZF adapted the connect@rail algorithm to evaluate the obtained data to detect noticeable problems

on the tracks and to precisely locate them using GPS. Maintenance work can be carried out early on and in an anticipatory manner, thus preventing delays, breakdowns and overloading of the rail network, as well as simplifying and automating operating processes.

ZF at InnoTrans 2022

ZF is showcasing its latest technologies for rail vehicles at this year's InnoTrans in Berlin, **Hall 20, Booth 580**.

Save the Date: ZF Innovation Forum

On Thursday, 22 September 2022, starting at 4pm, ZF experts will present the connectivity solutions together with partners and customers at the ZF booth. Join the ZF Innovation Forum and learn more about the connect@rail platform.



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Shaping
Smart
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NOW.



Your next connection: connect@rail

ZF's intelligent condition monitoring solutions support rail operators in permanent monitoring, early maintenance planning and predictive maintenance of their fleets. The modular connect@rail system uses integrated sensors and advanced data analysis tools to increase efficiency, reliability, and safety in rail transport.

For more information please visit
www.zf.com/connect-at-rail



Meet us at
InnoTrans
Booth 580, Hall 20
September 20-23,
2022

