RAILWAY
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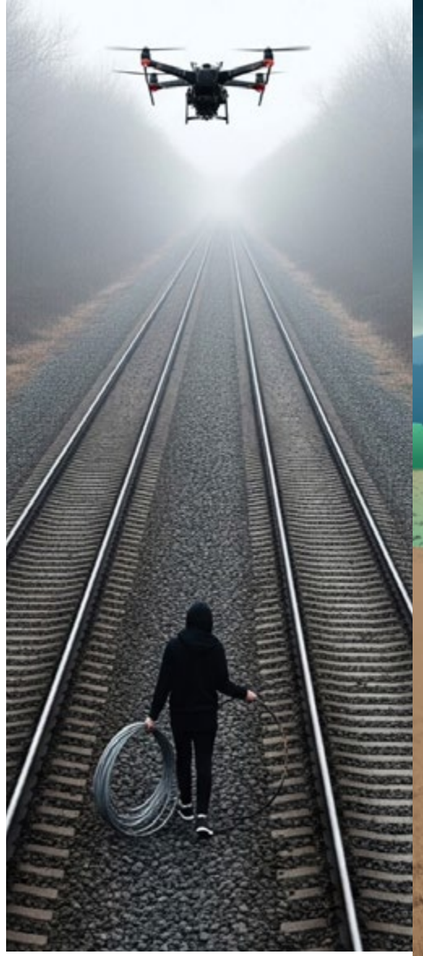

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NOKIA DEPLOYS WORLD'S FIRST 1900 MHZ 5G RADIO NETWORK ON DEUTSCHE BAHN TEST TRACK

Key features of the technology include built-in failover, self-healing capabilities and real-time monitoring to ensure high availability and efficiency.

DB Test Track in Erzgebirge, Germany. Photo Credit: Copyright Deutsche Bahn

Nokia and Deutsche Bahn (DB), Germany's national railway company, have deployed the world's first commercial 1900 MHz (n101) 5G radio network solution with a 5G Standalone (SA) core, running on live outdoor test tracks. This industry breakthrough positions DB to leverage a modern mobile network on a frequency band dedicated to 5G railway communications in Europe. It also serves as a basis for the Future Railway Mobile Communication System (FRMCS), supporting resilient, efficient and more sustainable rail operations through greater digitalization, capacity and service reliability.

This deployment marks a significant step in the railway industry's transition from the legacy Global System for Mobile Communications for Railway (GSM-R) to the 5G-based FRMCS standard designed for real-time, mission-critical communications between infrastructure and trains. Built to support full railway automation, FRMCS integrates advanced technologies like AI and underpins a more competitive, capable and future-ready industry.

The technology is being implemented at DB's digital railway test field in the Ore Mountains (Erzgebirge, Germany), running on live trains. Key features include built-in failover, self-healing capabilities and real-time monitoring to ensure high availability and efficiency. The solution will also be used for the European FP2-MORANE-2 project, which evolves from earlier FRMCS initiatives to advance the digitalization of rail across Europe.

The contract extends Deutsche Bahn's ongoing test trials with Nokia's 5G SA core and 3700 MHz (n78) radio network, while upgrading to a new solution that includes Nokia's 1900 MHz (n101) 5G radio network equipment from its AirScale portfolio and optimized 5G SA core. Designed for a smooth migration from GSM-R to FRMCS, it delivers the high reliability and low latency needed for modern rails.

www.nokia.com

VOSSLOH'S SONIQ RAIL EXPLORER CAN NOW BE USED ON DB RAIL NETWORK

In just a single pass, the testing device reliably detects and localizes flaws in the rail's interior, corrosion in the rail base and irregularities in weld seams.

DB InfraGO has approved the use of Vossloh's mobile ultrasonic testing trolley, the SoniQ Rail Explorer. This approval supplements the existing compliance verification issued by DB Systemtechnik and removes the last hurdle for the trolley's use on Deutsche Bahn's rail network. Various other European and Asian railways have been using this modern ultrasonic inspection trolley successfully for three years now.

The SoniQ Rail Explorer was developed in close collaboration with the Fraunhofer Institute for Ceramic Technologies and Systems IKTS in Dresden. In just a single pass, the testing device reliably detects and localizes flaws in the rail's interior, corrosion in the rail base and irregularities in weld seams. These capabilities make it particularly suited to pinpointing the exact location of previously detected flaws and for regular inspections of shorter track sections, switches, crossings, level crossings and station tracks. With the SoniQ Rail Explorer, Vossloh is setting new technological and ergonomic standards for mobile ultrasonic testing.

The inspection results show the condition of the rail in real time using various display options (called A and B scans) and can be combined with camera images. Data transmission back to the office is flexible and can be done using a USB, SD card or directly via LTE/WiFi, allowing the results to be seamlessly integrated into digitalized process chains.

Compact, flexible and ready to use in just a few minutes

With its compact dimensions and weighing only around 20 kilograms, the SoniQ Rail Explorer fits inside any station wagon and can be carried to the track by one person. Its main control element is a rugged tablet computer, which clearly displays all the inspection data. Nine ultrasonic test probes in the test wheel supply the raw data, which the unit continuously saves, and individual test probes can be activated or deactivated at any time in order to examine any specific flaw discovered. The trolley can operate in either direction, and it can also take optional camera images of the rail surface as it inspects the rail. The all-round maintenance service in Germany (Leipzig) guarantees short maintenance and inspection times, which provides planning security during normal operations.

www.vossloh.com

KONTRON COLLABORATES WITH QUALCOMM FOR DEVELOPMENT OF 5G FRMCS MODEM

The Kontron 5G FRMCS modem is based on the Snapdragon X72 5G Modem-RF System, which delivers unparalleled performance, reliability, and energy efficiency.

Kontron AG, a leading global provider of IoT/Embedded Computing Technology and 5G cellular modems, announced a collaboration with Qualcomm Technologies, Inc. to develop a next-generation 5G FRMCS (Future Railway Mobile Communication System) PC3 modem tailored for the MORANE 2 European railway communications initiative.

FRMCS will be the 5G standard for railway operational communications, adaptable to the needs and requirements of rail organizations within Europe and beyond.

The Kontron 5G FRMCS modem is based on the Snapdragon X72 5G Modem-RF System, which delivers unparalleled performance, reliability, and energy efficiency, making it the ideal foundation for FRMCS deployments in rail environments. Dedicated 5G railway communication frequency bands n100 (900 MHz FDD, BW 5 MHz), and n101 (1900 MHz TDD, BW 10 MHz), and public n28 frequency band.

Kontron AG will lead the design and development of the 5G FRMCS modem, integrating the Snapdragon X72 5G Modem-RF System into a ruggedized, railway-compliant solution. This modem will play a key role in enabling security-focused, high-speed, and more reliable communication across European rail networks, supporting both operational and passenger services.

www.kontron.com

500 W AC/DC SUPPLY – IDEAL FOR DEPOT USE AND AUXILIARY CONVERTERS

With the new AC-DC-Converter IC383, intreXis sets another milestone in the development of high-performance power converters for railway applications.

Building on the success of the 50-watt model, intreXis expands its AC portfolio with a unit offering 500 watts of output power – ideal for applications with higher power requirements.

This "*Workshop Supply*" is particularly suitable for use in vehicle depots, where only the vehicle auxiliary power converter or the depot's AC mains is available. This unit is also used in scenarios where the battery voltage should not be additionally loaded and instead, reserve power is available from the auxiliary power supply unit.

A wide input voltage range from 85 to 264 VAC and an output voltage of 24 volt make the new converter especially flexible and reliable for worldwide use.

Despite its high power, the IC383 impresses with an exceptionally compact design, measuring (L/W/H) 245 x 135 x 57 mm, and complies with all relevant rail-specific standards:

- EN 62368-1 (Safety
- EN 50155 (Railway applications – Electronic equipment used on rolling stock)
- EN 50121-3-2 (EMC – Rolling stock)
- EN 61373 (Mechanical stress – Vibration and shock)
- EN 45545-2 (Fire protection on railway vehicles)

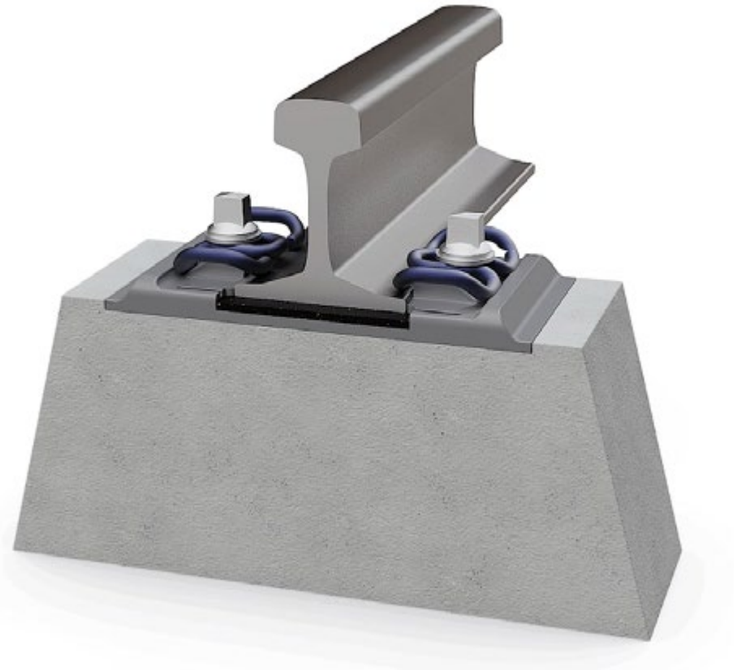
With its latest AC/DC Converter, intreXis is consistently expanding its existing AC/DC Converter platform – further variants in other power classes or with different output voltages are available on request.

www.intrexis.ch

THE EFFECT OF TEMPERATURE ON CORK-RUBBER RAIL PADS VERSUS RUBBER PADS ON RAILWAY ROLLING NOISE

Rail pads, the elastic elements placed between the rail and the sleeper, play a critical role in load transfer, vibration control and the long-term performance of railway infrastructure.

Rail pads, the elastic elements placed between the rail and the sleeper, play a critical role in load transfer, vibration control and the long-term performance of railway infrastructure.



Their behavior depends mainly on two properties: stiffness, represented by the shear modulus, and damping capacity, expressed by the loss factor. Both are highly sensitive to temperature, which directly affects how vibrations propagate through the track and how much rolling noise is radiated. Previous research, particularly the work of Squicciarini et al. (2015), has shown that these effects are especially relevant when comparing conventional rubber pads with cork–rubber composites.

Temperature Sensitivity of Rail Pads

Rail pads must balance stiffness and damping, and for that purpose, two parameters are central, such as:

Shear Modulus: The shear modulus is a measure of a material's rigidity against shear deformation. A higher shear modulus means that the rail pad is stiffer and deforms less under a given shear stress (load), while a lower shear modulus indicates that the material is softer and deforms more easily under the same stress/load.

Loss Factor: The loss factor is a measure of material damping, representing the ratio between the energy dissipated and the energy stored during cyclic deformation. Materials with a higher loss factor exhibit better damping behavior, as they dissipate more energy.

In this sense, temperature has a strong effect on both parameters. Tests carried out in a temperature-controlled chamber across the range of -20 °C to +40 °C revealed clear trends:

Rubber Pads: As the temperature increases, rubber pads soften. Their stiffness decreases and vibration isolation worsens, leading to higher rail vibrations and noise radiation. At around 40 °C, they are relatively soft and less effective. When cooled to –20 °C, their shear modulus increases by about six times, making them very rigid, but this mainly channels vibration into sleepers and ballast rather than reducing noise. Damping improves at low temperatures, although slightly.

Cork–Rubber Pads: Cork–rubber pads show an even stronger variation in stiffness with temperature, increasing their shear modulus by about ten to thirteen times between 40 °C and –20 °C. The advantage is that they remain stiffer than rubber at high temperatures, limiting the softening effect that amplifies noise. Around 0 °C they reach a peak in damping, with a loss factor up to 0.8, which significantly improves vibration suppression. This combination of higher damping in the transition region and greater stiffness at elevated temperatures ensures more stable performance across the full temperature span.

Implications for Rolling Noise

Rolling noise is one of the most significant sources of railway noise. It is generated when small irregularities on the surfaces of wheels and rails trigger vibrations that propagate through the track structure and radiate into the environment. Because rail pads regulate how these vibrations are transmitted, their response to temperature has a direct impact on noise levels.

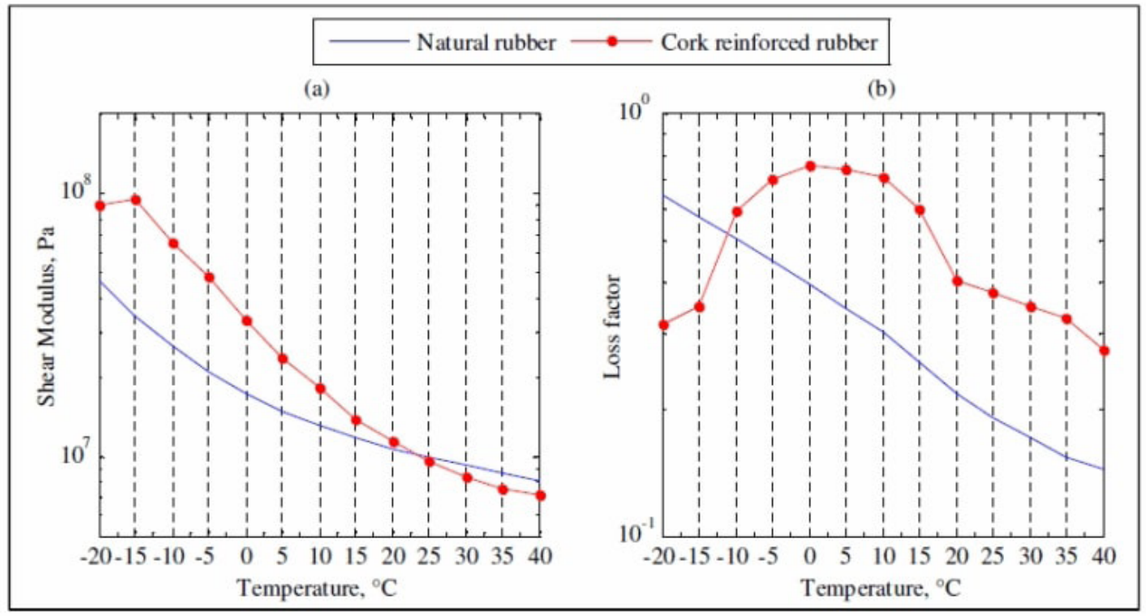


Figure 1. Shear modulus (a) and loss factor (b) measured at different temperatures. Results are obtained from 1 kHz frequency band. © Squicciarini et al., 2015

Field measurements confirm this effect. Real train pass-bys have shown an increase of 3 to 4 dB(A) when ambient temperature rises from 0 °C to 35 °C.

Predictive models extend this finding, indicating that natural rubber pads may lead to noise variations of up to 6 dB(A) across the full –20 °C to 40 °C range. Cork–rubber pads, by contrast, show a smaller variation of about 4 dB(A). Although both materials are affected by temperature, cork–rubber offers greater stability and predictability.

The reason for this difference lies in the material composition. As rubber pads soften with heat, they lose the ability to control rail vibration. Cork–rubber pads, however, maintain higher stiffness and exploit their damping peak around 0 °C, which together limit noise increases at both high and transitional temperatures.

Cork–rubber pads offer a more consistent and reliable acoustic performance, less variation in passenger comfort, and lower maintenance needs since the track dynamics remain more stable throughout seasonal and daily thermal cycles.

Why Cork–Rubber Pads Offer a More Reliable Solution

Environmental temperature has a decisive impact on the mechanical and acoustic behavior of rail pads. Conventional rubber pads soften at high temperatures and stiffen excessively at low ones, leading to significant noise variations of up to 6 dB(A). Cork–rubber composites, on the other hand, combine the elasticity of rubber with the inherent stiffness and damping capacity of cork. This synergy ensures higher damping near transitional temperatures, greater stiffness at elevated ones, and overall reduced sensitivity to climate fluctuations.

By providing predictable stiffness and superior vibration attenuation across the full range of railway operating conditions, cork–rubber rail pads represent a resilient and effective solution for modern rail infrastructure. They improve noise control, enhance passenger comfort and reduce maintenance requirements, making them especially valuable on geographies exposed to wide daily and seasonal temperature variations.

www.amorimcork.com

IBASE

IBASE UNVEILS EN-CERTIFIED RAILWAY COMPUTER MPT-7100R FOR SMARTER, SAFER TRANSIT

Compact, rugged system with 13th Gen Intel Core, wide-temp operation, and versatile expansion sets new standard for modern rail applications.

IBASE Technology introduces the MPT-7100R, its latest high-performance railway computer system meticulously engineered for the rigorous demands of modern rail transportation. Built to fulfill the industry standards, the MPT-7100R is certified to EN50155 (2021) and EN45545-2, ensuring unmatched reliability, operational safety, and fire protection in mission-critical rolling stock environments.

Powered by the 13th Gen Intel® Core™ U-series processor running up to 3.0 GHz, the MPT-7100R delivers exceptional multi-threaded performance. It features ignition power control and a wide-range voltage GPIO interface, ensuring seamless integration with railway power systems while enabling intelligent power sequencing and diagnostics. With dimensions of 25.6 (W) × 18.2 (D) × 9.7 (H) cm, the MPT-7100R offers a compact footprint that fits easily into space-constrained installations. Designed to operate reliably in extreme temperatures from -40°C to +70°C, its fanless, ruggedized architecture guarantees long-term stability and maintenance-free operation in harsh environments.

Engineered with versatility in mind, the MPT-7100R offers a comprehensive set of interfaces and expansion options to guarantee long-term adaptability for evolving railway applications. It comes equipped with rugged M12 X-code connectors for dual GbE and M12 A-code power and USB 2.0 ports, providing secure, vibration-resistant connections. Dual SIM sockets deliver WWAN redundancy for uninterrupted connectivity across railway networks. For advanced communication and system integration, it supports isolated CAN 2.0A/2.0B / CAN-FD interfaces, along with dual RS232/422/485 serial ports, complemented by a PCIe x4 slot and a removable blade fuse-protected power supply with an M3 grounding screw for added reliability. In addition, built-in M.2 and Mini PCIe slots allow flexible expansion for AI acceleration modules, WWAN, WLAN, and other custom applications, ensuring scalability and future-proof deployment.

Key Features of MPT-7100R:

- EN50155 (2021) and EN45545-2 certified railway-grade reliability
- Onboard isolated CAN 2.0A / 2.0B / CAN-FD up to 5 Mbps data rate
- Rugged M12 connectivity & dual SIM sockets with WWAN redundancy
- Ignition power control with wide-range voltage GPIO
- Versatile expansion options with PCIe x4, M.2, and Mini PCIe slots
- 1x USB Type-C alternate mode with PD 60W
- Compact, fanless design with wide-temperature operation from -40°C to +70°C.

www.ibase.com

Railway International - October 2025

TRANSMISSION DYNAMICS ADVANCES NEXT-GENERATION RAIL TECHNOLOGIES WITH FOAK 2025 BACKING

The FOAK programme is designed to accelerate innovation in the UK rail industry by supporting new technologies that can improve passenger experience, enhance safety, and increase operational efficiency.

Transmission Dynamics is driving the next wave of innovation in rail monitoring and safety, with two breakthrough projects set to transform overhead line resilience and tackle the persistent challenge of bridge strikes.

Building on their market leading Trains with Brains solutions, these new developments — IntelliPan Network and Bridge Strikes Guardian — represent the latest step in our mission to deliver smarter, AI-enabled solutions that enhance reliability, safety, and efficiency across the network.

Now in its eighth year, the FOAK programme is designed to accelerate innovation in the UK rail industry by supporting new technologies that can improve passenger experience, enhance safety, and increase operational efficiency. In 2025, £5 million was allocated across 26 winning projects.

Transmission Dynamics achieved success in two categories. In the AI for Complex Processes category, the company will develop their IntelliPan Network project, an AI-powered platform for protecting overhead line equipment (OLE). The project builds on the company's award-winning PANDAS-V pantograph and OLE monitoring system, extending it into real-time fault detection, automated decision-making, and protective response. This integrated approach will give infrastructure teams the ability to react faster, reduce risk, and prevent disruption before it occurs.

In the Bridge Strikes category, Transmission Dynamics will deliver Bridge Strikes Guardian, a monitoring and integrity assessment system designed to tackle one of the most persistent and disruptive challenges facing the network. Unlike traditional approaches, Bridge Strikes Guardian requires no civil works, making it suitable for rapid, scalable deployment across both urban and remote bridges, whether road-over-rail or rail-over-road. By delivering continuous monitoring and reporting, the system will support safer operations and help reduce the cost and disruption caused by bridge strikes.

This double win continues Transmission Dynamics' strong record of success in FOAK competitions. In 2022, the company secured funding for its Trains with Brains IIoT project, which integrated data from multiple train-borne monitoring systems into Network Rail's planning processes. That system is now routinely deployed across passenger trains, providing one of the most advanced IIoT applications in global rail and enabling more effective, data-driven maintenance planning.

www.transmissiondynamics.com

MODERN DELLNER ARTICULATION JOINT – ENHANCED SAFETY AND PASSENGER COMFORT

In today's rail transport, multi-unit vehicles have become the standard across urban, regional and long-distance traffic.

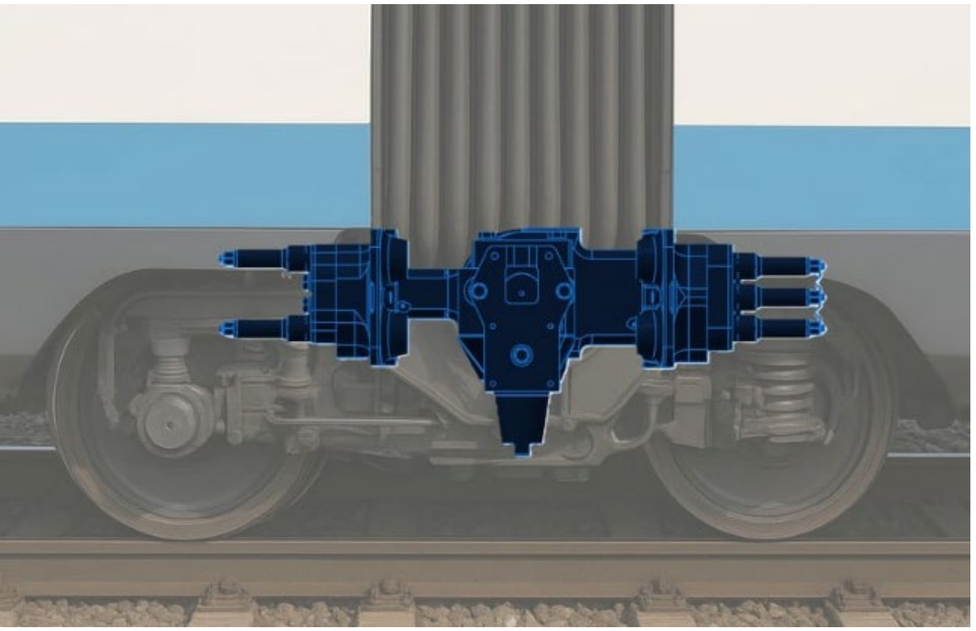


Figure 1. Articulation joint without energy absorption © Dellner

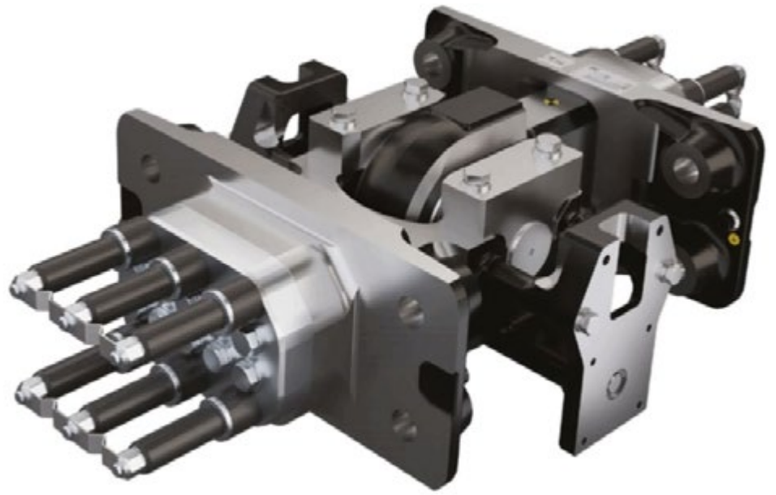


Figure 2. Articulation joint with energy absorption elements - Cold Drawn Bars © Dellner

There are two principal designs: independent wagons, connected by intermediate couplers, and vehicles that use Jacobs bogies with inter-wagon articulation joints to connect the units.

The wagons supported by Jacobs bogies are mechanically connected by joints that transmit longitudinal, vertical, and lateral forces, compensating for movements in bends and when traveling over uneven tracks. The use of Jacobs bogies with articulation joints improves vehicle stability and passenger comfort.

Dellner Technology
Dellner, a global leader in Train Connection Systems, supplies articulation joints in two versions: without an integrated energy absorption system, with our patented Crash Energy Management (CEM) technology based on Cold-Drawn Bar elements.

Energy-Absorbing Articulation Joints
Dellner's Cold Drawn Bars (CDB) technology is an innovative solution for crash energy absorption. By using these special screws in the articulation joints, the system effectively absorbs energy during a collision, significantly enhancing passenger safety and protecting the vehicle structure. The compact design of the articulation joint – reducing both size and weight – allows for greater adaptability to the available space within the vehicle frame. Its lighter construction also translates into energy savings during the operation of the entire vehicle.

Key Benefits
Dellner articulation joints offer a range of advantages for rolling stock manufacturers and rail operators:

- **Flexible connection of the units** – enabling smooth relative movement of wagons on bends, gradients and during track transitions.
- **Reliable force transmission** – the design guarantees reliable transfer of loads, increasing the stability of the entire train.
- **Energy efficiency** – the reduced weight of the joints reduces the vehicle's weight, which translates into lower energy consumption.

Dellner articulation joints are a crucial component for rail vehicles with Jacobs bogies, providing flexible coupling and effective force transmission during operation. Our innovative Cold Drawn Bars technology makes the joints safer by effectively absorbing energy in the event of a collision, protecting passengers and the vehicle structure. The compact and lightweight design of Dellner articulation joints translates into greater adaptability, energy savings and travel comfort.

Comprehensiveness and Integration – Dellner's Advantages
Dellner distinguishes itself not only in terms of modern solutions but also our comprehensive approach to implementing projects with integrated rail vehicle connection systems. This means that our customers have a single, experienced partner responsible for the entire project, ensuring consistency and time savings. Furthermore, Dellner provides full engineering support at every stage from advanced simulations and analyses to the design of solutions precisely tailored to individual needs.

https://www.dellner.com

KEY INFRASTRUCTURE UPGRADES TO MODERNIZE RAIL SYSTEMS

Modern rail systems face growing pressure to modernize due to aging infrastructure and rising freight demands.

This article explores key infrastructure upgrades – like AEI, RSM, and integrated data platforms – that improve efficiency, safety, and long-term scalability.

The demand for an efficient, safe, and reliable rail network has never been higher. With the increasing volume of freight and the limitations of aging infrastructure, rail systems are under mounting pressure to modernize. The shortcomings of legacy systems, including slow response times, limited visibility, and inefficiencies, are amplifying the need for smarter, more resilient infrastructure.

This article explores the core demands of modern rail systems and examines the infrastructure upgrades that can equip the rail industry to meet today's challenges while preparing for future growth.

Legacy Systems and Their Limitations
Legacy systems lack scalability and adaptability, resulting in slower response times and fragmented visibility across operations. Without modernization, freight railroads risk falling behind in meeting the industry's growing transportation demands.

Meeting Modern Demands
Advances in technology offer solutions that can help rail operators overcome these challenges. Three key areas stand out as essential for modern rail systems:

- Real-Time Insight: Clear visibility into all aspects of rail operations enables swift, data-driven decision-making.
- Proactive Maintenance: Identifying and addressing issues before they result in failures keeps operations running smoothly.
- Automation: Integrated systems and streamlined processes improve efficiency, saving time and costs.

The push for modernization isn't just about addressing today's issues; it's about building a sustainable, future-ready rail network.

Core Infrastructure Upgrades for Rail System Modernization
To remain competitive, rail systems need to adopt innovative infrastructure upgrades that enhance performance, safety, and uptime. Below are the key advancements driving rail system modernization.

1. Automatic Equipment Identification (AEI)
Manual car tracking is time-consuming and often inaccurate. AEI technology replaces these outdated methods with automatic tracking solutions, revolutionizing how rail assets are monitored.

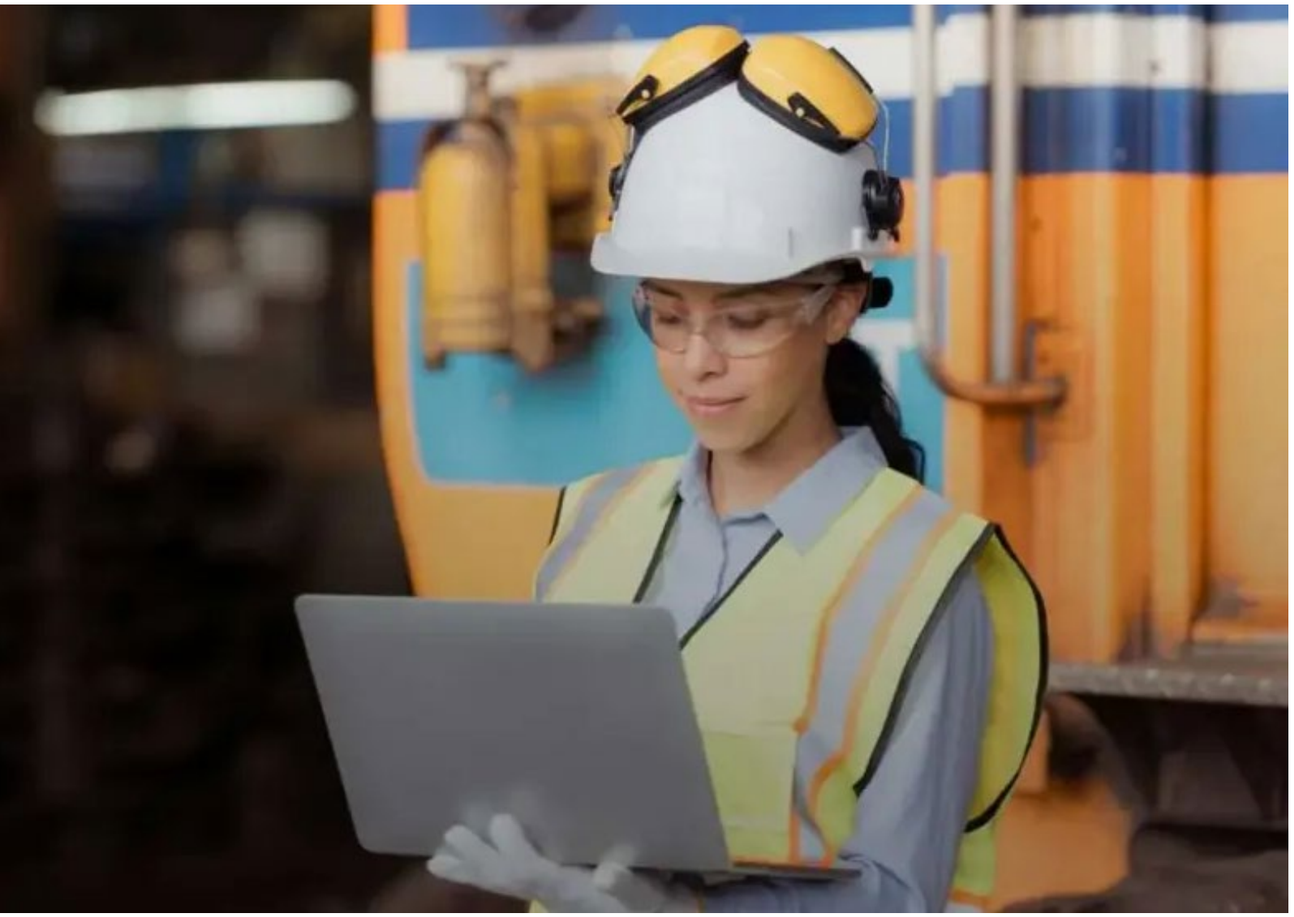
Improved Asset Visibility: AEI systems enable rail operators to track train compositions and individual railcars with precision.

Compliance and Efficiency: Advanced AEI readers, such as those offered by COMET, ensure compliance with the Association of American Railroads (AAR) standards while streamlining operations.

The integration of AEI systems represents a significant step toward smarter, data-driven rail networks.

2. Remote Site Monitoring (RSM)
Real-time visibility into equipment, signals, and environmental data is critical for efficient rail system management. RSM solutions provide this visibility, allowing rail operators to respond quickly to issues and reduce unnecessary downtime.

Outage Prevention: Remote monitoring reduces the risk of outages by enabling rapid diagnostics and maintenance planning.



Streamlined Operations: RSM systems help rail operators address issues in real time, minimizing delays.

By offering actionable insights, RSM is transforming how rail systems manage operations across remote and urban environments.

3. Wayside Technology and Sensors
Smart trackside systems equipped with advanced sensors enable rail operators to detect and address issues before they escalate.

Condition Monitoring: Continuous monitoring improves the ability to identify potential track or equipment failures.
Efficiency Gains: Better insights into rail system conditions lead to proactive decision-making and streamlined responses.

The deployment of wayside technology allows rail systems to evolve from reactive maintenance into predictive and preventative solutions.

4. Connectivity Infrastructure
Modern rail systems demand robust connectivity solutions to ensure seamless communication across assets and teams. Wi-Fi and cellular networks are essential to enable this transformation.

Enhanced Communication: Site-to-site and locomotive connectivity facilitate better coordination and data sharing.
Future-Proofing: These solutions lay the groundwork for mobile diagnostics and automation initiatives.

By bridging communication gaps, connectivity upgrades empower rail operators to make informed decisions faster.

5. Integrated Data Platforms
Rail networks generate immense amounts of data from various systems. Integrated data platforms unify this information, breaking down operational silos for improved decision-making.

- Centralized Insights: Unified platforms provide comprehensive visibility, optimizing rail network performance.
- Scalable Solutions: These platforms adapt as networks grow, ensuring long-term operational efficiency.

The integration of data platforms transforms rail infrastructure into a cohesive, adaptive system capable of meeting evolving demands.

The Future is Rail System Modernization
Modernizing rail systems isn't just about staying competitive; it's about addressing the critical challenges facing the industry today and ensuring long-term success. From smart sensors to centralized data platforms, these key infrastructure upgrades are equipping rail operators with the tools they need to meet the future head-on.

Why Invest in Modernization?
Modernization delivers measurable benefits:

- Cost-Effective Operations: Advanced systems reduce inefficiencies and streamline processes, leading to significant cost savings.
- Enhanced Safety and Reliability: Preventative technologies and durable materials reduce failures and delays.
- Sustainable Growth: Scalable solutions ensure rail systems can adapt to changing demands over time.

Forward-thinking rail operators know that modernization is not just a luxury but a necessity. By investing today, they can secure better performance, safety, and uptime for decades to come.

Are You Ready to Modernize?
Building a smarter, more resilient rail network starts with choosing the right partner. COMET is a trusted leader in rail system modernization, offering state-of-the-art solutions from AEI systems to integrated data platforms.

If you're ready to explore how these upgrades can transform your operations, get in touch with COMET today.

www.cometind.com

FAQS

What are the main limitations of legacy rail systems?
Legacy rail systems often suffer from slow response times, limited visibility, and inefficient manual processes. These challenges hinder scalability and real-time decision-making, making it difficult to meet growing transportation demands.

How does Automatic Equipment Identification (AEI) improve rail operations?
AEI technology automates the tracking of railcars and train compositions, enhancing asset visibility, improving compliance with industry standards, and streamlining overall operational efficiency.

What role does Remote Site Monitoring (RSM) play in modern rail infrastructure?
RSM provides real-time visibility into remote equipment and environmental conditions, allowing rail operators to diagnose issues quickly, prevent outages, and reduce downtime.

Why is connectivity important in rail system modernization?
Reliable Wi-Fi and cellular connectivity ensure seamless communication between assets, teams, and systems—enabling faster decision-making, mobile diagnostics, and automation capabilities.

What are the long-term benefits of investing in rail system modernization?
Modernization leads to cost savings, improved safety and reliability, and the ability to scale operations. It also prepares rail networks for future technological advancements and evolving industry demands.

BRAND

MOXA AWARDED IRIS SILVER CERTIFICATE FOR DELIVERING PREMIUM QUALITY, RELIABILITY, AND SAFETY IN RAILWAY PROJECTS

Moxa Inc. achieved the IRIS Certification Silver Quality Performance Level, joining the top 12% of certified rail equipment companies worldwide recognized for excellence in quality and performance.

Moxa Inc., a leader in industrial communications and networking, is proud to announce that the company has achieved the IRIS (International Railway Industry Standard) Certification Silver Quality Performance Level during a recent surveillance audit. This achievement puts Moxa together with the select 12% of certified companies in the international rail equipment sector that have been awarded an IRIS Silver rating.

To enhance the overall quality of the rail sector and drive innovation, IRIS certified companies can be awarded one of three performance levels — Bronze, Silver, or Gold. Achieving a higher quality performance level requires companies to boost customer satisfaction and improve the efficiency of their rail business. Moxa's steadfast commitment since 2013 to ensure the quality, reliability, and safety of its rail products and solutions comply with the rigid rail industry standards has helped elevate Moxa's performance level from Bronze to Silver.

Key performance areas for evaluation included customer satisfaction, timely delivery to customers, requirement management, project management, external supplier management, and traceability. Remarkable performance in these areas has significantly boosted Moxa's scores in the overall audit categories, which cover Enablers, Process Performance, and Customer Perception.

"*This achievement represents a significant milestone for Moxa's ongoing commitment to quality, reliability, operational excellence, and customer satisfaction in supporting global rail and mobility projects — from initial concept to long-term operation,*" said Samuel Chiu, head of the transportation business group at Moxa Inc. "*To attain the IRIS Silver rating, we've demonstrated our compliance with criteria additional to those essential to the standard, specifically relating to our management system and the operational processes involved in the development of our rail products and solutions.*"

The most recent IRIS Certification Revision 04 covers the latest version of the ISO 22163:2023 standard, the IRIS Certification Performance Assessment issued by UNIFE (Union of European Railway Industries) in July 2023, and the IRIS Certification Technology. It outlines a railway quality management system that integrates the ISO 9001 quality management standards along with railway-specific requirements.

Moxa's Commitment to Forging Mobility Ahead

With over 15 years of experience and expertise in digitalizing the rail industry, Moxa has developed more than 500 product offerings dedicated to helping build successful railway-specific applications. These applications include, but are not limited to, closed-circuit television (CCTV), computer-based train control (CBTC), train control and monitoring systems (TCMS), onboard passenger information systems (PIS), public address (PA) systems, passenger Wi-Fi, condition monitoring, and Wi-Fi 6 train-to-ground (T2G) communication.

Moxa's rail solutions are certified for a wide range of industrial standards, including EN 50155, EN 50121, IEC 62443-4-1/-2 cybersecurity, and EN 18031 for the wireless-capable product portfolio. This robust certification framework supports Moxa's track record of over 1,000 successful deployments across 200 cities in over 50 countries.

With involvement in railway projects around the world, Moxa is proud to partner with many industry leaders in the global rail market to define advanced, industry-transforming technologies and co-develop standards like IEC 61375. Moxa is also an active participant in key rail working groups such as Safe4Rail and ITxPT to help advance Ethernet train communication networks and improve interoperability and integration for public transport.

By obtaining this internationally recognized certification, Moxa underscores its dedication to providing outstanding solutions for the global rail market. Aiming to build on this success, Moxa is dedicated to implementing continuous improvement and striving towards the highest quality performance level for railway-specific quality management practices.

For the first time, Moxa Europe is taking part in the Railway Forum Berlin (2-4 September 2025 at the Estrel Congress Center, ECC). Moxa Europe will provide information about cyber-secure, reliable and easy-to-maintain railway network solutions for onboard systems, train-to-ground communication and trackside infrastructure.

www.moxa.com

LIEBHERR SUPPLIES PROPANE-BASED HVAC SYSTEMS FOR ÖBB FLIRT AKKU TRAINS

Liebherr delivers propane HVAC units for 16 Stadler-built FLIRT Akku trains, seating 160 passengers each, replacing ÖBB's diesel fleet by 2028.

Liebherr-Transportation Systems will supply heating, ventilation and air-conditioning (HVAC) systems that use propane (R290) as natural refrigerant for 16 battery electric multiple unit (BEMU) FLIRT Akku trains. The trains in three car-configuration are manufactured by Stadler Bussnang AG (Switzerland) and the initial delivery of Liebherr's three saloon and two driver's cab HVAC units will take place during this summer.

The battery trains will be operated by the ÖBB and shall replace parts of the Austrian Federal Railway's existing diesel train fleet. The FLIRT Akku trains with a seating capacity of 160 passengers each are intended foremost for use on non-electrified or only partially electrified lines along the Kamptalbahn in Lower Austria.

Roland Friedrich, Global Key Account Manager for Stadler, commented: "*We are very thankful for the trust Stadler Bussnang has placed in us. With our propane-based HVAC system we offer vehicle manufacturers and operators an efficient solution for a more sustainable mobility. For us as an Austrian based company, we are looking forward to further support our customers and local operators applying and servicing propane-based HVAC systems.*"

Propane: Maximum cooling performance with minimal energy consumption

The HVAC technology developed by Liebherr using propane as refrigerant is easy to service and guarantees rail vehicle operators a reliable product solution with low downtime. The concept takes all relevant safety requirements, such as the flammability for the refrigerant, into account.

Propane (R290) is a natural alternative to conventional, environmentally harmful refrigerants. In terms of pressure, it is very similar to the refrigerant R134. Up to the climate condition and configuration with a GWP of up to three, it provides a low greenhouse potential as well as maximum cooling performance with minimal energy consumption.

www.liebherr.com

HISTORIC SMELTER PAVES THE WAY FOR THE FIRST HYDROGEN-BASED RAIL AT THE DONAWITZ SITE

The last press release announced a significant milestone: the installation of the world's first hydrogen-based rail at Linz Central Station.

What often remains in the background is the highly innovative preparatory work that made this success possible in the first place—in particular, the historic meltdown in summer 2025 at the voestalpine site in Donawitz.

What Exactly Happened in Donawitz?

As part of a pilot project, the TechMet research steelworks conducted its first melting operation combining hydrogen-reduced pure iron from the HYFOR pilot plant with high-quality scrap. The goal: to produce a CO_2-reduced starting material for the production of premium rails.

In the adjacent rail rolling mill, two 30-meter-long rails were manufactured from this material – with mechanical properties that meet the highest requirements for hardness and wear resistance.

Why Is This Melt So Special?

Technological breakthrough: The successful processing of HYFOR material in a real production environment is proof of the technical feasibility of hydrogen-based steel production.

TechMet research platform: As a fully-fledged small steel plant, the Metallurgy Technology Center offers ideal conditions for such developments – a unique selling point.

Interdisciplinary collaboration: From process engineering to metallurgy to materials science – the project combined expertise from a wide range of fields.

This melt laid the foundation for the now-installed rail—a prime example of how research, technology, and sustainability go hand in hand at voestalpine Railway Systems. Yesterday's press release showcases the results—this article provides a glimpse behind the scenes.

www.voestalpine.com

NEXCOM

NEXCOM LAUNCHES VROK 3030-A-B TRIPLE-DISPLAY RAILWAY PANEL COMPUTER

NEXCOM's rugged 10.4" vROK 3030-A-B supports three displays, 1,200-nit brightness, Intel Atom processor, EN 50155 certification, reducing hardware costs.

As transportation technology evolves, the challenge isn't just finding powerful computing, it's finding the right kind: rugged, scalable, efficient, and adaptable for different roles. Rail operators often need both traditional box PCs as in-vehicle control centers and separate panel PCs for conductor and passenger displays. NEXCOM now offers a streamlined solution that does both: the vROK 3030-A-B, a next-gen panel-mount railway computer that blends control and display functions into one compact, high-performance system.

A Smarter Display Strategy

The 10.4" vROK 3030-A-B is designed for dual-purpose deployment, serving as an HMI in locomotive driver cabins or a display terminal in passenger areas. The biggest upgrade is its triple display capability. With both HDMI® and DisplayPort outputs, this panel-mount PC supports up to three simultaneous displays, including its built-in screen – ideal for delivering real-time data, infotainment, advertisements, and system status all at once. This represents a significant upgrade, offering expanded visual coverage without adding complexity to the system.

Its projected capacitive (PCAP) touchscreen delivers crystal-clear visuals with a 1200-nit sunlight-readable display and rugged protection for the front panel with its IP65 rating. Whether flush-mounted in a driver console or VESA-mounted on a dashboard, the vROK 3030-A-B adapts to your setup. Custom bracket and display options are available upon request.

Double Duty = Lower TCO

Why install both a box PC and a display when one device can handle both? The vROK 3030-A-B eliminates the need for a separate hidden box PC for passenger information systems (PIS), simplifying wiring and reducing hardware costs. Use it alongside two other displays to form a triple-display PIS setup, ideal for showing route maps, ads, onboard entertainment, and train speed or status. It's also suitable for more specialized environments like sleeper coaches.

Visual Coverage from Every Angle

Railway safety depends on visibility – and the vROK 3030-A-B doesn't disappoint. It supports both analog and IP cameras with four CVBS inputs (via optional capture card) and dual PoE ports (with optional PoE module). Whether you're connecting to interior or exterior cameras, the system helps enable full situational awareness, supporting use cases like rear-view monitoring, cabin safety, or platform surveillance.

Even better, power isn't a concern: onboard power support includes DC 24V/36V (non-isolated) and optional DC 24V/110V (with isolation), ensuring stable operation under challenging railway conditions.

Rugged Yet Flexible

Inside its compact frame, the vROK 3030-A-B offers plenty of muscle and room to grow. It features an Intel Atom® processor with low power consumption (9W TDP) and up to 32GB DDR4 memory.

For storage and connectivity, it includes:

- 1 x M.2 Key M 2280 (for SSD)
- 1 x mSATA (occupied Mini PCIe slot)
- 1 x Mini PCIe, 1 x M.2 Key B, and 1 x M.2 Key E expansion slots
- Multiple I/Os, including LAN (M12), COM (DB9), USB, CAN bus, and audio ports

Reliable by Design

Certified to EN 50155 (OT3, -25°C to 70°C) and MIL-STD-810H standards, it's built to operate under extreme rail conditions, such as vibration/shock and extreme temperatures. No matter the use case, the vROK 3030-A-B is ready for deployment on the front lines of smart railway systems.

Main Features

- Intel Atom® x6414RE processor, TDP 9W
- 10.4" TFT LCD monitor with PCAP touch
- IPS LCD with wide viewing angle and resolution 1024x768
- Sunlight readable capability: 1,200nits LCD brightness
- 1 x HDMI®, 1 x DP video outputs for triple displays, including its built-in screen
- 1 x isolated CAN bus 2.0
- 4 x CVBS input for analog cameras (work with optional capture card)
- 2 x PoE ports for IP cameras (optional)
- Panel-mount design suitable for diverse applications
- Operating temperature -30°C~70°C, EN 50155 class OT3 certificated for railway

www.nexcom.com

RAIL BI

ENHANCING RAIL SAFETY THROUGH ASSET LIFE ANALYSIS

In railway operations, safety is paramount.

Rail infrastructure plays a pivotal role across the whole transportation sector and maintaining a proactive stance towards asset safety is vital.

By closely monitoring the remaining lifespan of railway components across a network, renewals can be strategically planned and ensure a safety-critical buffer to mitigate any potential risks.

We've delved into the significance of remaining asset life analysis and how it helps in bolstering rail safety.

Understanding Remaining Asset Life
Remaining asset life is a metric that assesses the anticipated time before a railway component reaches the end of its functional life. This analysis is particularly crucial for safety-critical assets where maintaining a buffer between the remaining years of service and expiration is essential for preventing failures that could compromise safety.

Railway assets have a finite lifespan influenced by several different factors. These can be things such as wear and tear or environmental conditions for certain network areas.

The Rail BI platform displays the remaining asset life of all railway components across each network area, allowing the planning of future maintenance to be scheduled in advance and to ensure this safety-critical buffer remains in place.

Remaining Asset Life Analysis
Leveraging predictive analytics tools is integral to Remaining Asset Life analysis. By utilising historical data, maintenance records, and real-time monitoring, organisations can predict when safety-critical assets are likely to approach the end of their life. This foresight enables proactive planning for renewals, reducing the risk of unforeseen failures.

By assigning risk scores based on factors such as the role the asset plays in safety, its condition, and the consequences of failure, organisations can prioritise renewals for assets with higher safety implications.

By centralising data from various sources, organisations can streamline the monitoring process and make well-informed decisions regarding safety-critical renewals using our data warehouse.

Remaining asset life analysis aids in meeting and exceeding regulatory safety standards. By demonstrating a proactive approach to asset management, rail operators can ensure compliance with industry regulations, fostering a culture of safety and accountability.

What Are The Benefits of Remaining Asset Life Analysis?
The proactive nature of Remaining Asset Life analysis facilitates preventive maintenance. By identifying assets with limited remaining life, rail operators can schedule timely renewals, reducing the likelihood of unexpected failures and enhancing overall safety.

Railway components are subjected to heavy loads, vibrations and environmental stresses. Regular monitoring and adherence to asset lifespans can help to prevent unexpected failures that may lead to incidents or disruptions in rail services. Identifying and replacing components nearing the end of their lifespan through proactive maintenance reduces the risk of sudden breakdowns. Ensuring a safety-critical buffer through analysis enhances operational continuity. By preventing unexpected failures, rail operators can maintain a reliable and safe transportation network.

Signal systems play a crucial role in directing train movements and ensuring safe spacing between trains. If signal components exceed their lifespan, there is an increased risk of malfunctions or miscommunications. Regular inspections and replacements of signal components contribute to the reliability of the rail signalling system and overall rail safety.

Strategic renewals based on asset life analysis lead to cost-efficiency. By avoiding emergency repairs and optimising maintenance schedules, organisations can also minimise costs while maximising the lifespan of safety-critical assets.

Remaining asset life analysis stands as a linchpin in ensuring the safety and reliability of rail infrastructure. By adopting a proactive approach to safety-critical renewals, rail operators can create a resilient and efficient transportation network that prioritises safety. In an era where data-driven decision-making is paramount, the integration of asset analysis emerges as a key tool for safeguarding the future of railway operations.

Using business intelligence tools (such as our rail planning software platform) gives you the confidence to make better decisions, and enhance productivity and efficiency for all of your rail planning projects.

www.railbi.com

SENSONIC

TRESPASS TO TERROR: REAL-TIME RAIL SECURITY MONITORING

Railway security has long been a complex and challenging issue, with vast, long infrastructure networks presenting a near-impossible task for traditional monitoring methods.

Trespass or unauthorised access to railway property is more than just a nuisance; it's a safety risk that can escalate into far more serious threats, from costly vandalism and cable theft to acts of sabotage and even terrorism. The risks are expansive and varied, but new technology provides a powerful and expansive tool to gather real-time security intelligence.

Network	Country	Cost per year	Reference Source
Renfe	Spain	€25m	RailTech
Deutsche Bahn	Germany	€7.6m	BBC
SNCB	Belgium	€6m	Brussels times
SBB	Switzerland	$5.5m	Swissinfo
Network Rail	UK	£3.5m	Network Rail
OBB	Austria	€3.2m	RailTech
Irish Rail	Ireland	€1.2m	Irish Times

The dangers of track trespass are tragically real and well-documented. Over 58% of rail fatalities in Europe are "*Unauthorised Persons*". That's nearly 500 trespassers killed each year. The figure for suicide deaths on the railway is tragically nearly 5 times higher.

In the UK (where your author is based), there is a rail trespass incident reported every 30 minutes. Last year that resulted in over 108,000 minutes of delays to passenger trains.

That huge operational impact is before the trespasser has actively "*done*" anything. And of course their motives for intruding onto the railway vary enormously asl explore further here.

Graffiti cleanup costs millions of euros per year for each countries rail networks. Cable theft costs and their associated disruption incur similar eye-watering levels of cost.

There is also a darker side to people trespassing and interfering with the railway to cause terror and disruption, a topic that probably warrants its own separate article in future. However, it doesn't take much googling to find examples of malicious intention in Germany, France or further afield in the USA or India, where individuals have wreaked havoc targeting rail networks to gain attention for their chosen cause.

Knowing people are approaching or within the railway corridor is a vital first step to being able to secure railway and railroad infrastructure, and that is where the new technology comes in.

Distributed Acoustic Sensing (DAS) is a game-changing tool for rail security. This innovative technology transforms existing, or new, fiber optic cables into a continuous, sensitive array of virtual vibration sensors / microphones. It effectively turns a single cable, spanning many tens of kilometres, into thousands of individual vibration sensors that constantly "*listen*" for disturbances. When a person walks, digs, or otherwise creates a vibration along or near the tracks, DAS detects the acoustic signature of that activity.

But the real power of DAS isn't just in detection; it's in its ability to pinpoint the exact location of the event with remarkable accuracy. This precise geolocation, often down to ten meters, allows security teams to respond immediately and with precision. This is a significant improvement over traditional systems that rely on cameras or human eyeballs from resource intensive site patrols.

The technology doesn't just stop at the detection of trespass. As DAS gives an accurate geolocation, this enables automated response by other security tools such as CCTV or drones, or of course dispatching human patrols to apprehend the offender.

By providing real-time, long-distance monitoring, DAS enables a shift from reliance on deterrence to a more proactive security posture, actively listening to protect along the whole rail corridor. DAS allows railway operators to no longer rely on the deterrence of a fence or occasional patrol brings, effectively equipping a smart digital tripwire to the rail corridor to catch them in the act, protecting passengers, staff, and infrastructure from the trespassers who, whether out of curiosity or malicious intent, pose a real and present danger to railway operations.

www.sensonic.com

BREATHTAKING SCENERY & WINTER CONDITIONS IN NORWAY: PJM IS TESTING THE BEILHACK SNOW BLOWER FROM AEBI SCHMIDT

80 tonnes packed with sophisticated technology and one of the most beautiful railway lines in the world - these are the ingredients for a vehicle test by PJM in northern Europe.

PJM was commissioned with testing AEBI Schmidt's snow blowing machine Beilhack HB 1100S.
The tests are carried out in Norway according to TSI LOC&PAS:2024 and for the approval in Norway.
Credit: PJM

PJM was commissioned with testing AEBI Schmidt's snow blowing machine Beilhack HB 1100S. The tests are carried out in Norway according to TSI LOC&PAS:2024 and for the approval in Norway.
Credit: PJM, free of charge

The Austrian measurement technology specialist was commissioned to test the brakes and acoustics of the Schmidt Beilhack HB 1100S, which will be used by Bane NOR in the future.

The track tests for the brakes were carried out in accordance with TSI LOC&PAS:2024, EN14033-1:2014 and NNTR-NOR. The first tests took place between autumn 2024 and April 2025 in a wide variety of weather scenarios and included, among other things:

- Wheel slide protection tests to determine braking distance and braking performance in Holmenstrand

- Steep gradient track tests on the Flam Railway and further test runs between Finse and Voss. The Flam Railway is one of the most beautiful train journeys in the world and is one of Norway's main tourist attractions. From a railway engineering perspective, the gradient is particularly interesting: the maximum gradient is 55 ‰.

Furthermore, PJM was commissioned to carry out acoustic measurements for employment protection (health and safety requirements). These tests will be carried out in autumn.

"*The Beilhack HB 1100S is a high-performance snow blower that we develop and manufacture on a project basis. The tests carried out by PJ Messtechnik provide us with the data required for approval and we gain valuable insights for the further development of these highly complex machines. The precise measurement results help us to further optimise performance, safety and reliability,*" *says Thomas Kaiser, project manager at Aebi Schmidt.*

The snow blower was tested under various weather conditions. Credit: PJM

'The tests for the approval of Aebi Schmidt's high performance snow blower are another project for PJM involving special rail vehicles and railway construction machines. In recent years, we have tested various well-known special vehicles for approval in many parts of Europe,' says Martin Joch, CEO of PJ Messtechnik GmbH. 'Our measurement specialists not only have years of experience in testing a wide variety of rail vehicles, but also with country-specific standards and specifications as well as international project management.'

PJM's fields of expertise at a glance

- Accredited testing laboratory according to ISO/IEC 17025, in the areas of: brakes, acoustics, running characteristics, fatigue strength, aerodynamics and pantograph

- Engineering / construction CAD, calculation FEM, simulation MBS / certification AAR WABL Committee

- Development & manufacturing of instrumented wheelsets

- Autonomous measuring systems for rail vehicle and infrastructure

https://pjm.co.at/en/

DLR TESTS VIRTUAL COUPLING SYSTEM IN THE REAL WORLD

The solution, based on ultra-wideband technology, enables fast and precise communication, positioning and distance measurement over short distances.

Advancing automation in train operations is one way to transport more people and goods on the existing rail network. A key technology for this is the virtual coupling of train cars and formations. In this system, individual cars are no longer mechanically connected by a coupling, but only digitally – that is, they travel at a fixed, close distance behind one another. For this to work, the sections of the train must constantly communicate with each other and exchange highly precise data about their respective positions and speeds. In the R2DATO project, the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR) has developed a novel radio system for this purpose and successfully tested it on a closed railway site.

As part of the project, the DLR Institute of Communications and Navigation primarily investigated decentralised, direct communication between trains when they are relatively close to one another. "*We're talking about distances of 20 to 200 metres, which is needed for virtual coupling,*" says project manager Paul Unterhuber. "*For the railway sector, that is extremely close because, depending on the speed, braking distances can range from several hundred metres to a kilometre.*"

Ultra-wideband technology for fast and precise communication, positioning and distance measurement over short distances

The system developed and tested by DLR for this purpose uses ultra-wideband (UWB) communication. This radio technology transmits data across an extremely wide frequency spectrum and enables precise positioning and data transfer over short distances. UWB is currently used in smartphones, small tracking devices for indoor or industrial use and car keys for locking and unlocking vehicles. "*A further advantage of UWB is that it enables us to calculate the distance between two trains very precisely,*" explains Unterhuber. "*To do this, we use what is known as latency. This is the time it takes for data packets to travel from the transmitter to the receiver – giving us all the information we need to control acceleration and braking processes in the close range that is crucial for virtual coupling.*"

The system developed for the R2DATO project also features a laser-based measurement system. This serves as a reference system, gauging the distance between trains to evaluate the accuracy of the UWB measurements. Batteries supply power to all system components.

Track debut – close spacing demands special attention

The first tests took place at the end of April 2025 on a technical track area belonging to the Dutch national railway operator Nederlandse Spoorwegen (NS) in Amersfoort, the Netherlands. Two regional trains equipped with DLR's radio system ran up and down a 350-metre stretch several hundred times. The DLR system was housed in two compact boxes mounted on the mechanical couplings on the front of the trains. A third box on the ground served as a base station and collected additional data.

The two trains simulated multiple different scenarios at speeds ranging from 10 to 25 kilometres per hour – for instance, running one behind another at distances of 15 to 80 metres, or with only one train moving while the other remained stationary. The trains were controlled by train drivers – a demanding task due to the short distances involved. For comparison, the DLR team also provided the train drivers with live information from the DLR system on a separate monitor. "*The drivers welcomed this additional information, because it made control much simpler,*" Unterhuber continues. "*In the future, data from such systems will not only support train drivers but also contribute to largely automated or even autonomous train operations.*"

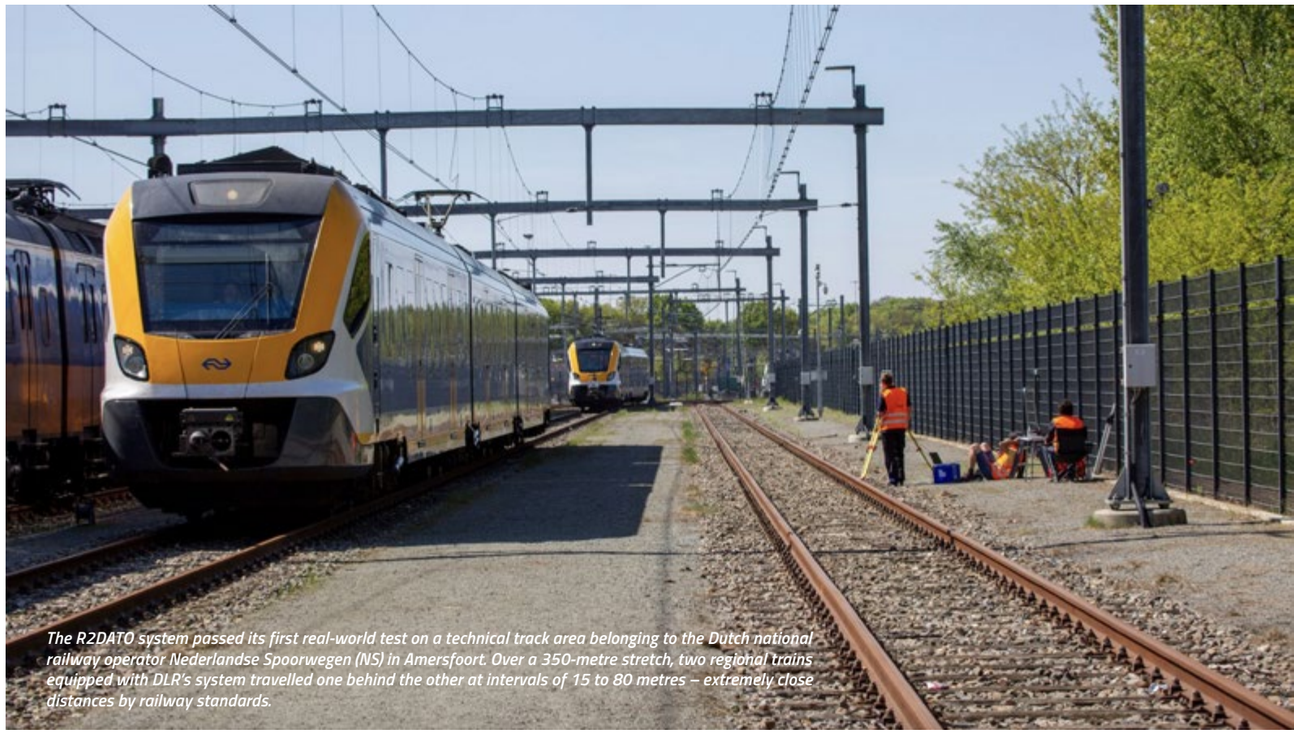
Feasibility demonstrated in a railway setting

The initial test results gave the team cause for optimism, demonstrating that the distance between the two trains could be determined to within a few centimetres – something not possible with the technologies previously used in the railway sector. "*Generally speaking, our tests showed that communication between trains and the resulting distance calculations work in real-life railway settings, at distances from a few metres up to 350 metres,*" says Unterhuber. "*We have demonstrated proof of concept – the feasibility of our concept in practice. Now we are continuing to evaluate the data collected so that we can make further statements about the precision and reliability of the DLR system.*"

The Next-Generation Train TAXI (NGT-TAXI) concept, developed as part of DLR's rail transport research, also relies on virtually coupled train sections. NGT-TAXI is designed to enable automated train operation on branch lines, making these routes more attractive again. It will operate on demand, virtually coupling multiple train carriages depending on the number of passengers.

https://youtu.be/T424LpuiC9U

www.dlr.de



The R2DATO system passed its first real-world test on a technical track area belonging to the Dutch national railway operator Nederlandse Spoorwegen (NS) in Amersfoort. Over a 350-metre stretch, two regional trains equipped with DLR's system travelled one behind the other at intervals of 15 to 80 metres – extremely close distances by railway standards.

For the first real-world tests, the system developed by DLR was mounted in two compact boxes on the mechanical couplings at the front of the trains.

HOW TO CHOOSE YOUR RAILWAY FUSES?

Railway fuses are a key safety component in the electrical systems of trains.

Mersen's railway fuses are designed to protect against overcurrents and short circuits, ensuring the safety of both the electrical systems and the passengers. Their fuses are known for their fast-acting characteristics and reliability in demanding railway environments.

Determine the Application
Identifying the specific application within the railway system is the first step in selecting the appropriate railway fuse. Different applications, such as traction motor protection, signaling systems, or onboard electronics, have distinct electrical requirements. The chosen fuse must be compatible with the electrical demands and operational conditions of its intended application.

Considering Voltage Rating
Voltage rating of railway fuse should be equal to or exceed the maximum voltage present in the circuit it is intended to protect. In railway systems, voltage requirements can vary, especially between high-voltage lines and lower voltage onboard systems. Ensuring the correct voltage rating is essential for effective protection.

Measuring Current Rating
Selecting a fuse with the appropriate current rating is vital. This rating should slightly exceed the normal operating current of the circuit to avoid nuisance tripping, yet be low enough to safeguard against overcurrent situations. The current rating ensures the railway fuse will operate correctly under normal conditions and respond effectively during faults.

Taking Breaking Capacity Into Account

The breaking capacity indicates the maximum current that the fuse can safely interrupt. In the high-power environment of railways, a railway fuse with a sufficient breaking capacity is essential to prevent equipment damage and ensure safety during overcurrent events.

Physical Size and Form Factor of Railway Fuses
The physical dimensions and form factor of the railway fuse must be compatible with the space available in the railway system's electrical panels or fuse boxes. The size and shape of the fuse are important for ensuring it fits properly and functions as intended.

Considering Environmental Factors
Railway fuses must be able to withstand the specific environmental conditions they will be exposed to, such as temperature variations, humidity, and vibration. Selecting railway fuses that are robust and reliable under these conditions is crucial for long-term performance and safety in railway applications.

www.mersen.com

REX-ROYAL PRESENTS THE LATEST GENERATION OF THE S2 RAILWAY AT THE RAIL INTERIORS SHOW IN PRAGUE

On 24 and 25 November 2025, the international railway industry will gather at the Rail Interiors Show in Prague, and Rex-Royal will be there.

The focus of the trade fair presentation at stand #404 will be on the enhanced version of the S2 Railway, which has been specially designed for use in rail vehicles.

The fully automatic coffee machine impresses with its high performance, low noise level and a redesigned steam system for particularly fine-pored milk foam – even under challenging operating conditions. Thanks to its vibration-resistant design, intuitive user interface and compact shape, it is ideal for use in confined galley kitchens.

Christoph Staubli, Project Manager Railway at Rex-Royal, said: "*We are very much looking forward to the Rail Interiors Show in Prague. The event brings together trade visitors, manufacturers and decision-makers. It's exactly the right environment to talk about innovations that noticeably improve the travel experience*".

The current generation of the S2 Railway is connected to the Rex-Royal Cloud as standard. This enables central monitoring of machine status, operating data and consumption in real time – a clear advantage for operators who depend on reliable processes and predictable maintenance.

Staubli said: "*Participants can look forward to a solution that not only impresses with its quality, but is also economically and technically well thought-out. Our machine delivers consistently good results, whether in peak operation or over longer distances*".

Rex-Royal cordially invites you to visit stand #404 – freshly brewed coffee included.

www.rex-royal.com

OBB

ÖBB AND VOESTALPINE PIONEER WORLD'S FIRST HYDROGEN-BASED RAIL

ÖBB and voestalpine deploy the world's first hydrogen-produced rail in Linz, using net-zero CO_2 technology and recycled materials to advance sustainable rail infrastructure.

ÖBB CEO Andreas Matthä and voestalpine CEO Herbert Eibensteiner, in the presence of Federal Minister Peter Hanke, Governor Thomas Stelzer, and Regional Minister Günther Steinkellner, laid a globally unique rail at Linz Central Station: the hydrogen-based material used was produced with net-zero CO_2 emissions. With this innovation, the two leading Austrian companies aim to significantly reduce railway-related CO_2 emissions in the long term – marking another milestone on the path to climate-neutral mobility.

"*Innovations 'Made in Austria' like this are a key reason why the Austrian railway industry ranks among the best in the world. In Europe, we are even the undisputed leader in per capita exports. Our clear mission is to further expand this international pioneering role and actively shape the mobility transition,*" emphasized Federal Minister Peter Hanke.

"*Every train journey starts with the first meter of rail. Today, this journey into a sustainable mobility future has gained even more momentum. One future meets another here: the hydrogen-based rail meets the critical four-track expansion,*" said ÖBB CEO Andreas Matthä.

Hydrogen instead of coal – green technology makes it possible

For the first time worldwide, a rail has been manufactured using hydrogen-based technology. Green hydrogen replaces fossil fuels in the production process. voestalpine CEO Herbert Eibensteiner stated: "*At voestalpine, we have already successfully launched our transition to green steel production and are progressing rapidly with the construction of two electric arc furnaces powered by green energy in Linz and Donawitz. At the same time, we are conducting research on various breakthrough technologies in collaboration with industry and science partners . Producing the world's first hydrogen-based rail at our Donawitz site is a historic milestone.*"

The climate-neutral rail also makes a key contribution to the circular economy – as it is made entirely from recycled materials.

High-tech from Donawitz – Quality and Sustainability 'Made in Austria'

The innovative rail was produced in Donawitz, Styria, home to one of the most modern rail rolling mills in the world. It was delivered just-in-time to Linz Central Station within a few hours – supporting regional value creation and efficient logistics. This innovation once again highlights Austria's international leadership in rail technology.

A strong signal from Upper Austria for Europe's railway future

With today's achievement, ÖBB and voestalpine are sending a powerful message – not just for innovation and climate protection, but also for the capabilities of Austria's industrial sector. "*With the world's first hydrogen-based rail, we are proving that Upper Austria's industry doesn't just have a proud history – it is actively shaping the future. Climate-neutral steel, modern railway infrastructure, and sustainable mobility – made in Upper Austria. This symbolizes what makes our region strong: smart minds, skilled hands, and innovative companies. These are the foundations of the competitive edge and locational advantages we need to stay ahead tomorrow,*" emphasized Governor Thomas Stelzer.

Linz–Wels expansion

The rail was laid as part of construction work at the west exit of Linz Central Station – a key section of the continuous four-track expansion of the Western Line between Vienna and Wels. The "*Linz Central Station West Side*" project is creating essential capacity for the rail traffic of the future.

"*Four tracks will eliminate the bottleneck between Linz and Wels. This will enable better train services in the central Upper Austria region,*" said Regional Minister for Infrastructure Günther Steinkellner. Both passenger and freight train capacity will increase. The four-track expansion from Linz toward Wels is key to achieving this. Passengers will benefit greatly: a denser S-Bahn system in the Linz-Wels area, an integrated timetable, and an overall improved offering in regional and express train services. In addition, new, modern, and barrier-free stops with park-and-ride facilities will enhance the travel experience.

www.oebb.com

INTERFACE SOLID STATE RELAYS

In addition to panel-mount or Din-Rail mount Solid State Relays, celduc relais offers compact and modular interface relays.

What Is an Interface SSRs?
Interface technology means separating, forming, processing, converting and adapting signals.

Interface relays are special types of electrical relays that ensure the safe and reliable transmission of signals to automation systems. This interfacing is crucial for the proper functioning of automated systems.

In modern automation, the control element is a computer or an automation system connected to the process by a multitude of wires leading to sensors or actuators. These high-performance processors in their domain are sensitive to interference and surges from the industrial environment. Additionally, their operating range is often limited to 24 VDC / 100 mA in voltage and current.
In order to achieve voltage/current adaptation and galvanic isolation, it is necessary to interface them with elements ensuring these functions while transmitting the logical input and output orders while protecting against industrial disturbances.

This is possible thanks to our range of interface relays. The relay is placed between your control system and your equipment to ensure safe switching.

What Are the Main Benefits of Interface Relays?
Interface Solid State Relays are used in demanding industrial applications:

- Safe and reliable galvanic isolation, voltage conversion & circuit multiplication
- Highest contact ratings
- PCB or socket mounting
- Compatible with electromechanical relays
- AC or DC outputs
- Suitable for all load types
- High I/O isolation (≥4000V)

Typical Applications
This line of interface relays is designed to fit a wide range of industrial applications. We have solutions for almost all application needs.

Here are some examples of applications:

- Reduced PLC outputs to meet energy consumption goals
- Switching currents or voltage too high for PLC outputs to handle
- Interfacing two or more system voltages – for example, 24V to 120V
- Controlling multiple loads from safety and interlock commands
- Reduced PLC outputs by using relays to turn many devices on and off simultaneously

celduc relais Interface Solid State Relays
celduc relais offers a wide range of interface relays tailored to your specific needs.

Compact interface relays with a 5 mm pitch, fully compatible with electromechanical relays **(SL series).**

Standard AC or DC interface relays, from 1 to 5A, with integrated protection (VDR or transil), available in heights of 15.7 mm (ST series) and 25.4 mm **(SP series)**.

Rail DIN mountable interface relays **(XK series).**

With celduc relais, choose a complete, innovative, and compact solution for all industrial applications.

Need more information? Contact us today to discover the complete range of celduc interface relays tailored to your specific needs.

www.celduc-relais.com

→ XKA

→ SLA with base ESD01000

WESTERMO

WESTERMO DEBUTS OPEN-STANDARD RAILWAY COMPUTING PLATFORM

Westermo's Hyrax-1000 modular BoxPC meets EN 50155 railway standards, offering 7 expansion slots, GNSS, and -40°C to +70°C operation under the open ModBlox7 architecture.

Westermo has introduced the Hyrax-1000, a robust, modular computing platform that offers flexible performance scaling through various CPU options. Developed according to the open ModBlox7 standard, the Hyrax-1000 is an individually configurable BoxPC with mass storage capacity, ideally suited for railway applications. Despite its compact design, it features a comprehensive set of interfaces in the basic version, including Gigabit Ethernet, RS232/422/485, DisplayPort and USB 3.0.

Thanks to its modular architecture, the system can be expanded with up to seven interface or communication modules, enabling highly tailored configurations. The versatile housing design allows for DIN rail, wall, and 19" rack mounting, ensuring easy integration across a wide range of industrial environments.

Developed in compliance with the railway standard EN 50155, the Hyrax-1000 is maintenance-free and can be deployed in an operating temperature range from -40°C to +70°C. It provides a flexible, future-ready solution for train manufacturers, railway operators, and system integrators seeking alternatives to proprietary BoxPC systems.

Driving Modular Innovation in Industrial Computing

Today's industrial computing market is largely dominated by rigid, proprietary systems that struggle to meet modern requirements for compactness, low weight, and cost-efficiency, performance and interface flexibility.

Addressing these limitations, the ModBlox7 standard - developed by PICMG, a non-profit consortium of over 130 member companies - introduces an open, modular platform architecture optimized for scalable embedded systems.

By eliminating the need for complex components such as backplanes or shelf controllers, ModBlox7 significantly reduces system costs while maintaining flexibility and performance. This allows manufacturers to create cost-effective and adaptable computing solutions that can evolve with changing application needs.

Westermo Helps Shape the ModBlox7 Standard

Today, more than ever, an open standard is essential for modern embedded systems – one that combines the advantages of traditional system designs with those of BoxPCs. This requires a standardized form factor, including suitable mounting options as well as clearly defined interfaces between the functional units within the BoxPC.

This approach is supported by PICMG and its member companies. The consortium continues to drive the development of embedded computing specifications, including the new ModBlox7 form factor, and promotes the adoption of open standards across a wide range of embedded computing applications. Westermo played a leading role in defining the new specification, collaborating with 18 industry partners through a dedicated task force within PICMG.

For industrial users, the key advantages of an open BoxPC standard are cost-optimized system design and easy component interchangeability, enabling tailored solutions for specific applications. Manufacturers also benefit by focusing on their core technologies without the need to develop every embedded component themselves.

Advancing standardization with new modules

Together with its partners, Westermo is driving standardization within the PICMG, with the goal to enable cross-vendor compatibility and interoperability. The Hyrax-1000 is the first commercial realisation of the ModBlox7 vison – a modular, scalable and individually configurable system with integrated GNSS support, ideal for customized embedded edge computing in many challenging areas, such as the railway sector. Typical use cases include telematics, diagnostic systems, passenger infotainment, IoT gateways, edge computing, and data-based cloud services.

The fanless, maintenance-free design of the Hyrax-1000 allows flexible mounting, including DIN rail, wall or 19" rack or sub-rack, for seamless integration into vehicles or control cabinets, even in space-constrained environments. Thanks to its modular concept, a wide range of extension modules can be implemented to meet customer-specific requirements and functions. The extension modules are pre-assembled units, enabling flexible configurations and short delivery times for custom systems.

Available wireless extension modules include options such as Wi-Fi 3x3 MIMO (802.11ac) and LTE, with support for up to four SIM cards per module for maximum network coverage and operational flexibility. The Wi-Fi interfaces support client operation, e.g. for train-to-ground communication, as well as access point mode for connecting onboard clients.

Designed for Growth

In the future, additional modules will be introduced, expanding the system further as an open modular platform. This will allow additional configuration of computing solutions for specific applications and make it easier to adapt systems to evolving needs.

To expand the storage capabilities of the Hyrax-1000, dedicated mounting space for an internal M.2 solid-state drive (SSD) is provided. Connected via the CPU's dedicated SATA 3.0 port, the SSD enables local data storage in a wide range of applications, such as multimedia streaming, operational logging, and sensor data analytics.

With its modular design, the Hyrax-1000 provides a future-proof platform, allowing customers to scale, customize, and adapt their systems as requirements change – delivering long-term value with minimal complexity or cost.

www.westermo.com

A NEW ERA IN RAILWAY INFRASTRUCTURE MANAGEMENT

Safety, Automation, and Efficiency – The Pillars of Modern Railways.

In the age of digital transformation and intelligent infrastructure, railway line managers and operators face increasing demands regarding safety, efficiency, and regulatory compliance. Meeting these requirements is not only a matter of well-trained personnel but above all, appropriate digital tools. A key role in this process is played by the modern Asset Management System (AMS).

Comprehensive Support Throughout the Entire Infrastructure Lifecycle
AMS is a web-based platform designed for managing railway infrastructure. It covers the full lifecycle of infrastructure components – from registration and inspections, through repair scheduling, control of technical documentation, to long-term maintenance planning. The system is particularly well-suited for managing complex linear assets such as turnouts, tracks, signals, or axle counters, covering both sidings and national networks.

Registration and Passportization of Infrastructure Components
In AMS, every infrastructure element – from tracks and platforms to sensors and safety devices – can be registered and assigned to a specific type. The system allows the input of technical parameters, inspection history, and operational status. Passportization ensures full traceability and compliance with technical and legal standards.

Automation of Inspections and Preventive Maintenance
The system enables fully automated inspection planning – considering inspection types, locations, inspection teams, and defined maintenance rules. Its intuitive interface provides quick access to inspection status, last check date, and forecast of upcoming tasks.

Real-Time Monitoring of Technical Condition
AMS allows real-time monitoring of resource conditions – based on both manually entered data and IoT sensor readings. Color-coded technical status (e.g., green – safe, orange – warning) allows instant assessment of the situation. All data is saved in the Electronic Maintenance Book.

Incident and Failure Management
The system supports rapid response to unplanned events, failures, or interventions by field technicians. The process includes event registration, assignment of repair tasks, monitoring progress, and confirming restoration. Reports and alerts allow tracking response time and action effectiveness.

Document Registry and Compliance Control
Each infrastructure component can have assigned documents – from technical protocols to certificates and audit lists. The system automatically monitors document expiration dates and sends notifications, minimizing the risk of key data becoming invalid. It also supports versioning, archiving, and access policies.

Integration With GIS Systems – Infrastructure on the Map
One of AMS's greatest strengths is its integration with GIS systems like ESRI ArcGIS. Users can view infrastructure on dynamic maps, mark operational areas, analyze events in a geographical context, and plan work with specific locations in mind. This is invaluable for managing linear assets.

Process Automation and Action Coordination
AMS significantly reduces manual work by automatically generating inspection plans, using ready-made maintenance templates, and intelligently assigning tasks to appropriate departments or personnel. The result is lower costs, reduced downtime, and higher infrastructure reliability.

Summary – One Solution, Full Control
Asset Management System is a comprehensive solution for any railway infrastructure manager looking to modernise operations and increase asset control. By integrating data on resources, inspections, compliance, and geolocation in one place, AMS supports fast and accurate decision-making. Whether you manage a regional siding or a national network – this system helps ensure safety, efficiency, regulatory compliance, and long-term infrastructure durability.

www.petrosoft.pl

PETROSOFT

DB CARGO

TRANSFESA LOGISTICS LAUNCHES SUSTAINABLE INTERMODAL SERVICE MED EXPRESS

With this innovative concept, the DB Cargo subsidiary is creating a sustainable and flexible transport solution that significantly improves cross-border logistics in Europe.

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www.petrosoft.pl

WABTEC AND IMT SIGN EXCLUSIVE AGREEMENT TO DISTRIBUTE RAILCAR TELEMATICS IN EUROPEAN MARKETS

The partnership combines Wabtec's rail expertise with IMT's cutting-edge telematics to deliver smart, connected solutions enhancing safety, efficiency, and customer experience across Europe.

Wabtec Corporation and Intermodal Telematics B.V. (IMT), the Dutch leader in rail telematics technology, today announced an agreement expanding the exclusive distribution rights to include the European market. This agreement makes Wabtec the exclusive distributor of IMT's telematics solutions for railcars in the major European freight markets. It also leverages IMT's advanced technology and Wabtec's market presence to deliver smart, connected railcar solutions across Europe.

This partnership is a step forward in Wabtec's digital transformation strategy, aimed at providing fully integrated, data-driven solutions that optimize rail operations. By combining IMT's telematics expertise with Wabtec's in-depth knowledge of braking systems and rail technology, the two companies will offer their customers smarter maintenance, enhanced safety and improved operational efficiency.

"*This agreement aligns two strong players in the rail industry and opens the door for large-scale telematics deployment in Europe and sets the basis for continuous developments of digital-based solutions to enhance efficiency, performance, service reliability, and safety,*" said Dethmer Drenth, Managing Director of IMT. "*Our proven technology will be supported by Wabtec's extensive network and customer relationships, enabling rail operators to benefit from real-time data and increased visibility across their fleets.*"

Wabtec's European telematics offering will include IMT's full suite of sensors, gateways, and connectivity solutions, enabling real-time monitoring of location, load status, and critical components such as brake system. The agreement includes dedicated support, performance targets, and long-term service continuity commitments.

"*This emerging technology in the rail industry unlocks powerful, real-time information for customers regarding location, condition, and health,*" said Evan Sevel, Wabtec Vice President of Growth and Innovation.

According to Cédric Lebrat, Vice President UIC Freight Components Product Line: "*The opportunity to turn the European fleet of railcars into smart, connected assets by using this technology is a game changer, one capable of tilting the customer-experience balance back in favor of rail and, with it, driving a major modal shift.*"

The collaboration builds on IMT's track record in tank container monitoring and extends its innovation to freight rail under the Wabtec brand, creating new efficiencies and value for the European rail sector.

www.wabteccorp.com

WABTEC

HITACHI RAIL, DB CARGO AND PARTNERS LAUNCH EUROPE'S FIRST AUTOMATED FREIGHT LOCOMOTIVE

Pioneering ATO and RTO technology for smarter, greener, and more efficient rail freight across Europe.

Together with DB Cargo and other partners, Hitachi Rail is setting a new benchmark for the future of European rail freight: for the first time, a DB Cargo locomotive has been equipped with state-of-the-art ATO (Automatic Train Operation) and RTO (Remote Train Operation) technology — a milestone on the path toward an automated, connected, and high-performing freight rail system in Europe.

As the technology partner, Hitachi Rail is supplying the onboard ATO system and overseeing system integration. This underlines the company's role as a pioneer of digital innovation in the rail sector. The aim is to test automated driving functions under real-world conditions and lay the foundation for a production-ready, marketable solution for automated freight transport — ultimately supporting one of Europe's key transportation policy goals: shifting more freight to rail.

Trials are scheduled to begin in October 2025 on the Dutch Betuweroute, one of Europe's most important freight corridors.

"*This project exemplifies our ambition to deliver real solutions for the mobility of tomorrow through technological excellence,*" says Daniel Stoll, Project Manager at Hitachi Rail in Germany. "*Automation is the key to using capacity more efficiently, reducing energy consumption, and making rail freight more attractive, more powerful, and more future-ready overall.*"

Launched in November 2022, the project is supported by Germany's Federal Ministry for Digital and Transport. It forms a core part of Hitachi's commitment to sustainable, digitally connected rail mobility in Europe — and stands as a prime example of how collaborative innovation can drive real change on the rails.

www.hitachirail.com

HITACHI RAIL

OVERALL IMPRESSION AND OUTLOOK INNOTRANS 2024

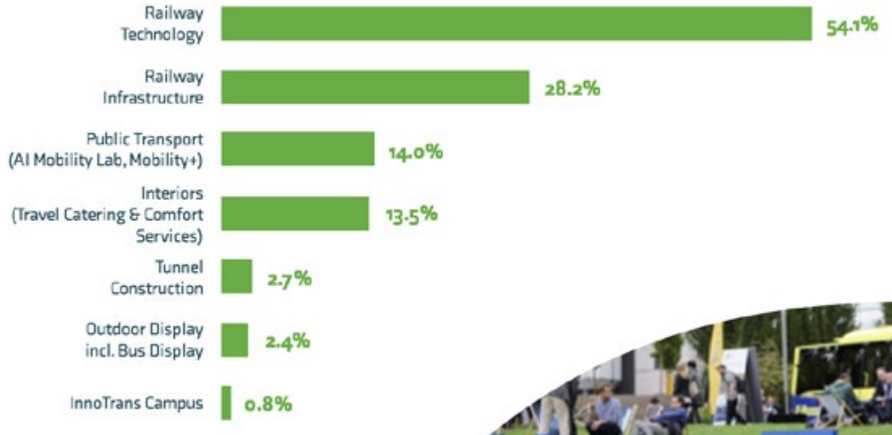
InnoTrans, the world's largest trade fair for transport technology, set several records at its 14th edition from 24 to 27 September 2024.

It occupied all the exhibition halls and the entire outdoor and track area of the Exhibition Grounds of Messe Berlin and offered the largest exhibition space since InnoTrans was founded in 1996. 'InnoTrans 2024 was a real record-breaking trade fair - both in terms of exhibition space and visitor numbers. Around 170,000 visitors from 133 countries came to the Exhibition Grounds of Messe Berlin this year - so we were once again able to increase the pre-corona level in terms of visitor numbers and internationality. InnoTrans has impressively demonstrated that it is the world's leading trade fair for transport technology and mobility,' says Dirk Hoffmann, Chief Operating Officer of Messe Berlin.

'InnoTrans was once again the event of the global railway industry,' said InnoTrans Director Kerstin Schulz. 'With a firework display of innovations and 226 world premieres, the trade fair attracted visitors from all over the world.' The 2,940 exhibitors from 59 countries presented their latest products and services in the five trade fair segments Railway Technology, Railway Infrastructure, Public Transport, Interiors and Tunnel Construction. The trade fair became even more international this year. Around 600 new exhibitors took part - and with them new countries such as Morocco, Malaysia, Indonesia and South Africa. Exhibitors from all over the world presented 133 vehicles on the 3,500 metres of track. In the Bus Display in the Summer Garden, trade visitors were able to experience eleven buses in live operation on a 500 metre long circuit.

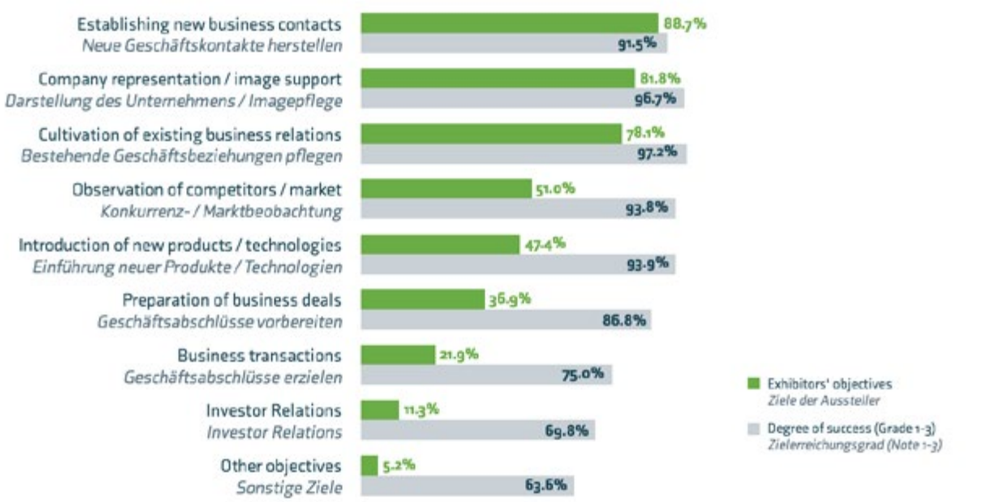
The main topics at this year's trade fair were sustainability, electrification, digitalisation and, above all, artificial intelligence. 'AI is also becoming increasingly important in the transport industry,' says InnoTrans Director Kerstin Schulz. InnoTrans took this development into account with the new exhibition area,

Focal points of the exhibition
Ausstellungsschwerpunkt



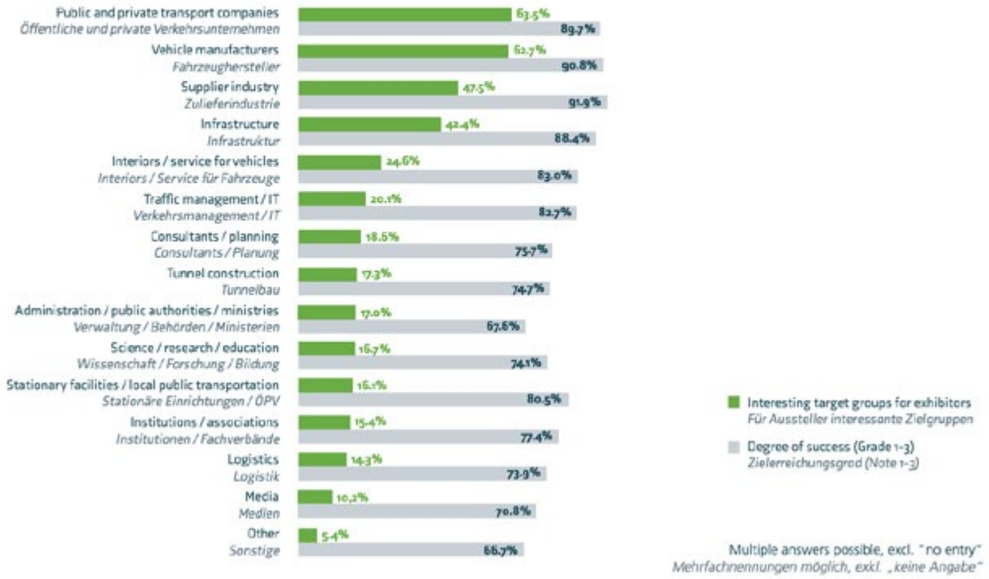
Multiple answers possible, excl. "no entry"
Mehrfachnennungen möglich, exkl. „keine Angabe"

Objectives of the exhibitors and achievement of these objectives
Ziele der Aussteller und Erreichung der Ziele



Multiple answers possible, excl. "no entry"
Mehrfachnennungen möglich, exkl. „keine Angabe"

Visitor target group and target group achievement
Besucher:innen-Zielgruppen und Zielgruppenerreichung



the AI Mobility Lab. 'This was exactly the right decision. The demand for AI-based solutions and cybersecurity was enormous,' reports Schulz. 42 exhibitors from 17 countries presented their expertise in AI, robotics, data protection and cybersecurity. The next InnoTrans will take place at the Exhibition Grounds of Messe Berlin from 22 to 25 September 2026.

What exhibitors had to say about InnoTrans 2024:

Michael Peter, CEO of Siemens Mobility: 'We are delighted with this year's InnoTrans in Berlin - the trade fair was a great success. We were able to show thousands of visitors and customers how Siemens Xcelerator uses standardised interfaces to digitally connect data from our products, operators and ecosystem partners in new ways. In this way, we are promoting ground-breaking innovations that make rail transport the most sustainable, convenient and cost-efficient transport solution. InnoTrans offers us the perfect setting for personal dialogue and joint progress.'

Henri Poupart-Lafarge, CEO of Alstom: "*This InnoTrans 2024, we saw how the industry is actively responding to the rapidly evolving transportation needs of the world. I am grateful for the many visitors from around the globe, particularly Alstom's customers and partners, who took the time to exchange with us. We were proud to showcase the innovation from our 84,000 talented employees, working together to make transportation clean, efficient, smart, reliable, enjoyable and accessible for all. The challenges we face – climate change, rapid urbanisation, and a changing technological landscape – need a united approach and we are well are on the way. InnoTrans 2024 has confirmed my optimism about the future.*"

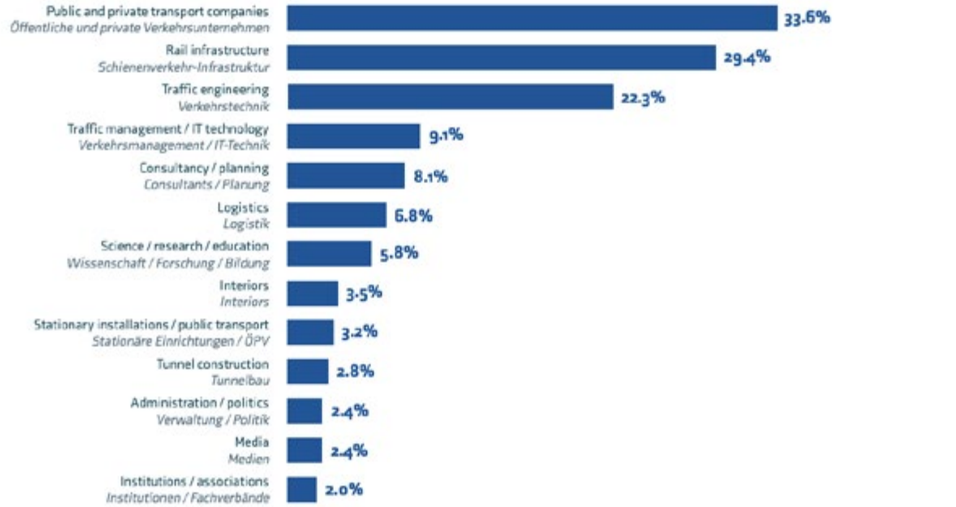
Dr Richard Lutz, CEO of Deutsche Bahn AG: 'More rail in Germany and Europe and therefore more climate protection can only be achieved together. That's why the dialogue within the industry at InnoTrans is so important. With innovative approaches and digital technologies and with tangible improvements for our passengers in terms of trains, connections and integrated public transport services, we at DB are taking responsibility for a strong railway.'

Markus Bernsteiner, Group CEO of Stadler: 'InnoTrans 2024 was a great success for Stadler. At our stand, we were able to present our innovative strength for modern rail vehicles and customised signalling and service solutions to our guests and customers. With eight vehicle concepts, we once again demonstrated our commitment to sustainable, safe and reliable mobility. We look forward to the upcoming projects and partnerships that will emerge from this successful week at the trade fair.'

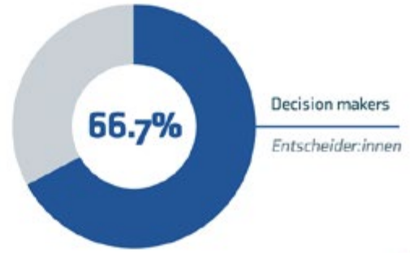
Enno Wiebe, General Director, UNIFE (European railway industry): "*The largest ever InnoTrans has impressively demonstrated the capabilities of the rail supply industry, and the role it will play in delivering the railway system of the future. With fair international competition and a level playing field with other modes - alongside ensuring the necessary financial means and migration paths - we can continue to successfully deploy what has been presented here in Berlin, the capital of the Future of Mobility.*"

Dr Heike van Hoorn, Managing Director of the German Transport Forum (DVF): 'InnoTrans is always an impressive showcase, a class reunion for the industry and a source of encouragement in difficult times. The latter was particularly important this time because we were once again able to realise how much is in motion and how modern the railways are. If we finally unleash the industry politically in this country, then it will be able to fulfil our mobility dreams. The road is not easy, but we can do it!'

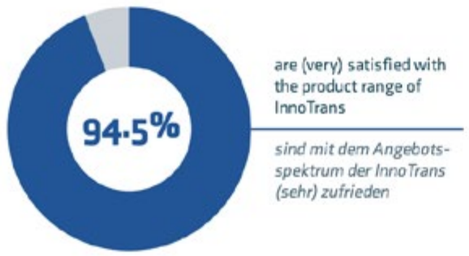
Industry affiliation
Branchenzugehörigkeit



Decision-making authority
Einkaufs- / Beschaffungs-kompetenzen



Spectrum of offers | Angebotsspektrum



Top 3 on a scale of 6 excl. "no entry"
Top 3 auf 6er Skala exkl. „keine Angabe"

Malte Hofmann, Industry Segment Manager at HARTING: 'We are very satisfied with the high number of high-quality customer meetings at InnoTrans 2024, which not only gave us the opportunity to present innovative new products, but also to discuss future topics such as the circular economy and generative AI. With its growing international audience, it is the most important trade fair in the rail industry.'

www.innotrans.com