



RAILWAY
SYSTEMS
by voestalpine

zentrak CONNECTING EVERYTHING

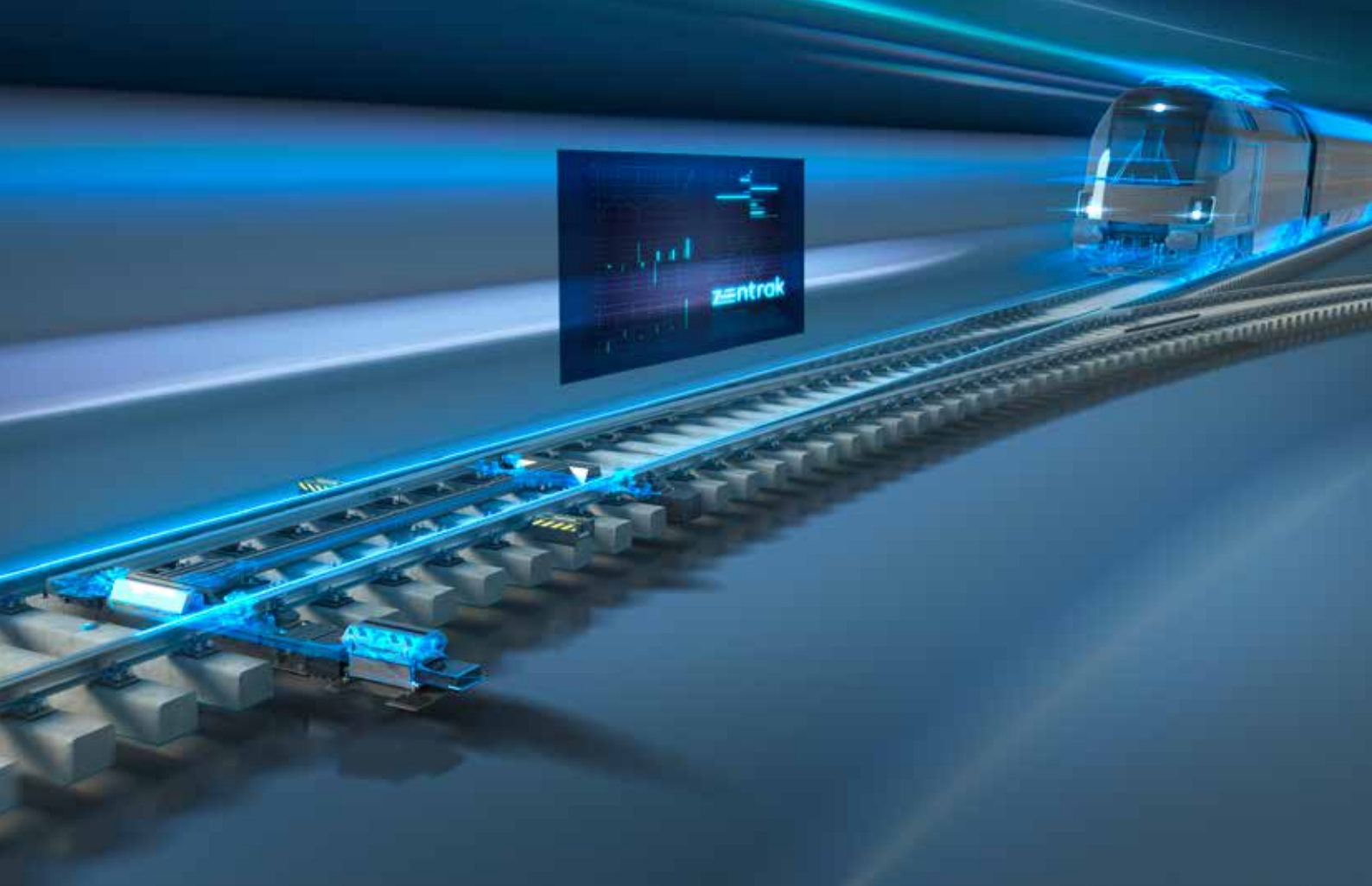
The intelligent, conscious and
living railway system

voestalpine

ONE STEP AHEAD.

voestalpine Signaling

www.voestalpine.com/railway-systems



HARNESS THE POWER OF RAILWAYS

Dynamic. Transformative. Vital. All around the globe, railway systems pave the way for growth, connecting people with the places they need to be. Tracks and trains have shaped the world we live in, and for over a century, **voestalpine Railway Systems** has been the beating heart of progress.

The success of our past is driven by our belief in the future: we believe in the power of railways to drive development at the intersection of technology and the limitless capacity of the human mind. That's why, with zentrak, we pull the levers that drive growth for railway systems around the world: **digitalization, software engineering, and data management.**

We're harnessing data to create networks that combine maximum profitability with the highest safety standards. Driving digitalization to create ultra-modern assets with a distinct human feel. Utilizing the latest technology to replace reactive legacy systems with predictive, prescriptive superintelligence.

Why? To help you create the most efficient, reliable, and high-performing railways that the world has ever seen.

WELCOME TO THE FUTURE.
WELCOME TO zentrak.

zentrak

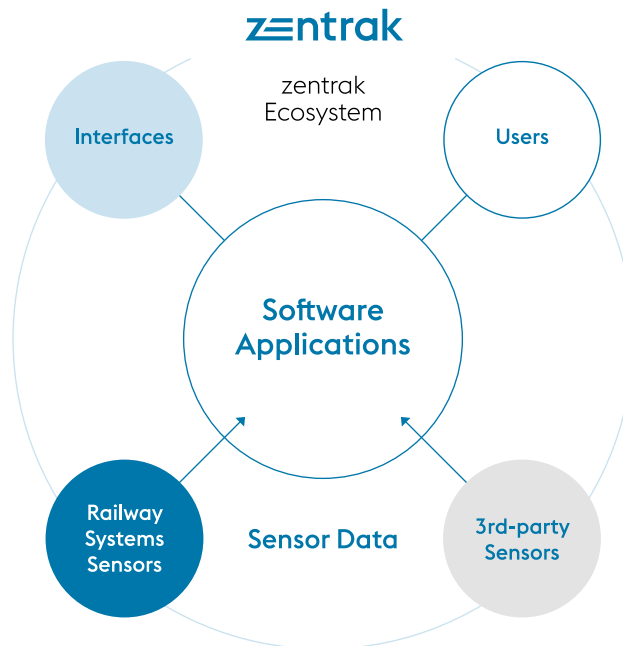
CONNECTING EVERYTHING

THE INTELLIGENT, CONSCIOUS AND LIVING RAILWAY ECOSYSTEM

Your railway network keeps the world moving forward: but your infrastructure is only as strong as the technology that holds it together. That's where zentrak comes in: our intelligent, living railway ecosystem enables you to create and manage the most efficient, reliable, and high performing railway track assets in the world.

zentrak's three modules **Rolling Stock Monitoring, Infrastructure Monitoring and Asset & Maintenance Management** combine as a catalyst for cost effective digitalization and sustainable, long term growth: building a future in which your railway network thrives intelligently.

zentrak ECOSYSTEM





RAILWAYS ARE CHANGING

zentrak CHANGES THEM FOR GOOD.

Our solutions address the industry's biggest challenges to drive sustainable, scalable change. zentrak combines human innovation with the technology that leverages it: achieving significant resource optimization.

We prioritize the secure collection, processing, and analysis of data to enable our customers to make the right decisions and overcome the challenges in front of them.



CAPACITY DEMAND

As railway traffic continues to grow, the demand for efficient and reliable operations becomes increasingly critical. With increasing levels of data, as well as missing data, from new data sources and data types, simply processing traffic can throw your operations off track. With zentrak technology, our next-generation systems transform your measurement data into valuable information for your operation. With features including structured storage functionality for life-cycle data and historical data, we drive the adoption of cost-effective systems that drive efficiency.



ASSET AVAILABILITY

With rising rail utilization worldwide, customers expect availability. However, increased use means shorter inspection intervals, and with little lifetime-based analysis of complete railway systems available, keeping the overview is key. zentrak drives the holistic digitalization of critical assets, creating Digital Asset Files in a secure hub for storing and retrieving system data. This end-to-end approach makes data a central part of your profitable, flexible railway ecosystem.



DOMAIN KNOWLEDGE

Combining domain knowledge and structured systems is a challenge for railway operators: inconsistent documentation and non-unified frameworks stop knowledge being shared. By streamlining data collection from on-track personnel, zentrak turns fragmented data into actionable intelligence: blending real-world experience with sensor-collected data on track condition. This trust in documentation and asset health enables your assets to meet higher performance expectations.



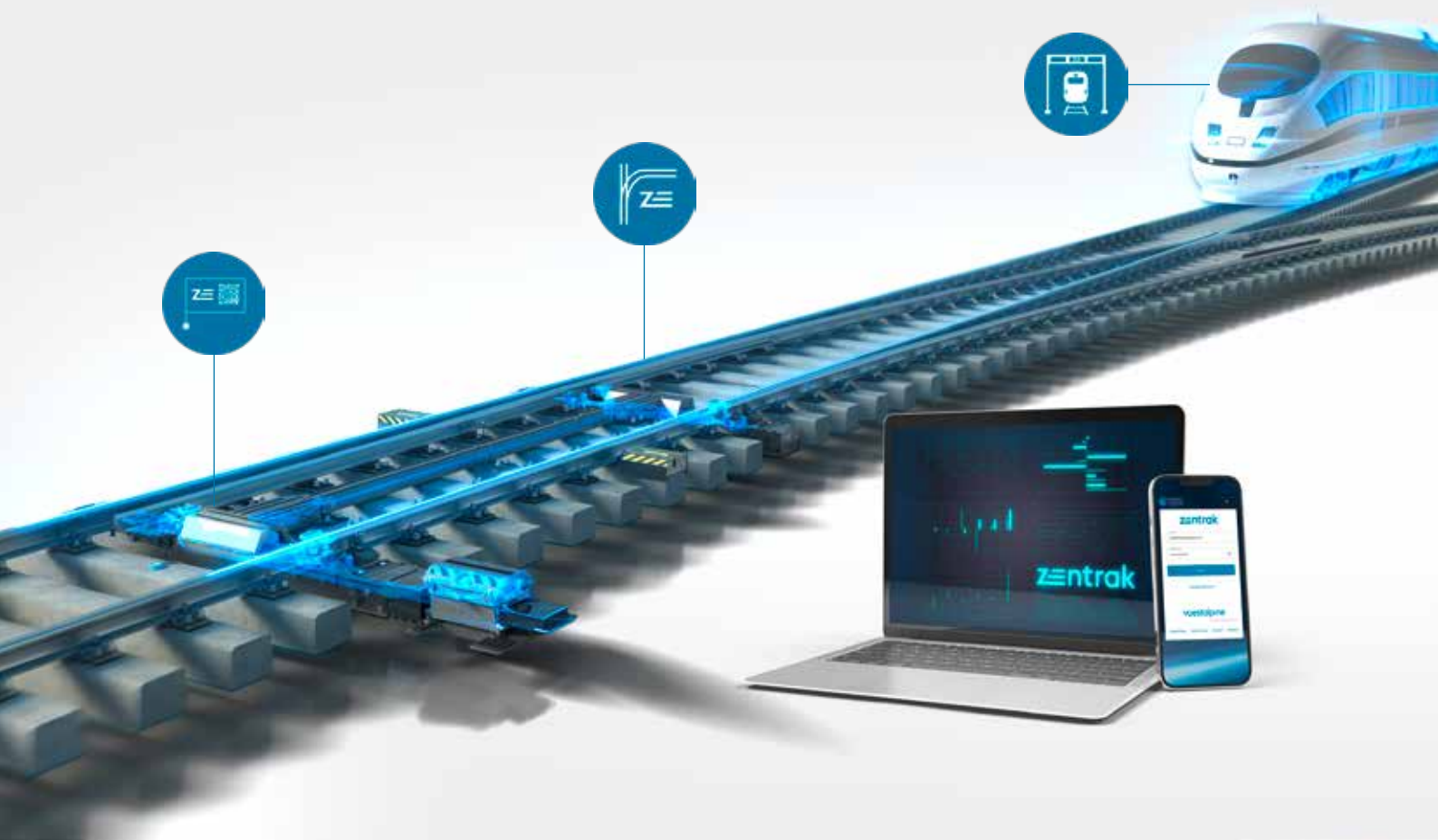
MAINTENANCE OPTIMIZATION

Complex network expansions demand a rethink of traditional maintenance: reactive approaches cause unplanned downtime and higher costs worldwide. With zentrak, you get access to data-driven predictive and prescriptive maintenance methodologies, future-proofing your ecosystem with low costs and more reliability. We use our own data and external sources for analysis, prediction, recommendations, and suggestions – helping you make better decisions.



AUTONOMOUS TRACK

Railways augment human resources with the power of machines. A shortage of trained personnel, a focus on safety, and budget pressures have led to intense competition, but zentrak is committed to autonomous solutions that conform to the highest standards of data security. For on-track staff, relevant information is always clearly visualized, drawing attention to alerts and prognoses. By reducing reliance on manual labor and enhancing safety by minimizing hazardous exposure, zentrak streamlines operations while keeping long-term costs down.



MODULAR APPROACH. TOTAL CONTROL.

In today's fast-paced railway industry, the data-driven monitoring of your entire operation is essential to its success. With zentrak, our modular approach integrates, data-secure software and hardware solutions, delivering unparalleled performance, scalability, and reliability over every centimeter of your network.

zentrak modules provide full control over the most critical elements of your future-facing railway network. In addition to technical and functional requirements, our solutions ensure regulatory and norm-conformity too. It's the on-time arrival of intelligent, conscious, and interconnected railway operations.

zentrak

THREE, POWERFUL SYSTEM MODULES

- » Infrastructure Monitoring
- » Rolling Stock Monitoring
- » Asset & Maintenance Management



zentrak INFRASTRUCTURE MONITORING

You've built a railway infrastructure with the goal of transporting millions of people and tons of freight, quickly, safely, and efficiently. The challenge: remaining profitable and safe with rising demands on infrastructure and the need for round-the-clock availability. From a customizable user interface, featuring a reporting function and possibility to set KPIs, zentrak Infrastructure Monitoring helps you ensure maximum route availability, all the while optimizing lifecycle costs and enhancing profitability.

Through real-time condition monitoring for your infrastructure, the system enables the early detection of future fault sources and proactive, condition-based maintenance: helping you break free from reactive models. Likewise, with features such as Switch Condition Monitoring, Train Detection Monitoring, Rail Crossing Monitoring and Signaling Power Monitoring – in addition to Track and Rail Monitoring – every part of your infrastructure is covered.



zentrak ROLLING STOCK MONITORING

Railways operators face immense challenges in balancing efficiency and safety. Comprehensive digitalization, diagnostic systems, data analytics, and preventive maintenance are essential to addressing these challenges and preventing asset failure. zentrak Rolling Stock Monitoring is the innovative solution that empowers rail operators with the tools needed for smarter maintenance practices. We provide turnkey supply and implementation services globally, with customizable solutions that help our customers achieve their goals: preventing failures while optimizing operational efficiency.

In addition to wayside diagnostic and monitoring functions, zentrak Rolling Stock Monitoring includes software applications for real-time diagnosis and asset management. Likewise, with Fleet Condition Monitoring, System Supervision, plus Alarming and Intervention services, you can perform critical maintenance planning effectively. Our interconnected hardware and software also enable cost-efficient installation of additional sensor functionalities at existing monitoring sites



zentrak ASSET & MAINTENANCE MANAGEMENT

zentrak Asset & Maintenance Management is key to a future-proof, interconnected ecosystem: harmonizing unstructured maintenance data, upgrading asset management processes, and supporting on-track personnel. Our cost-effective solution works best in combination with both Rolling Stock and Infrastructure Monitoring to provide you with a 360° view of railway assets and enable prescriptive maintenance. With our customer portal, we provide yet another disruptive technology: enabling “digital twin” storage that drives transparency and increased information quality on assets. We've also got an eye on data security, ensuring the safe exchange of data from your system to ours and back again.

On a cost-effective basis, zentrak Asset & Maintenance Management brings vital product information to where you need it most. With monitoring and analysis of fixed asset and rolling stock data, it enables data-driven decision-making for investments, improvements, and the implementation of a dynamic, paperless maintenance strategy. The result: a minimization of operation costs, maximum availability, fewer failures, and a continual increase in maintenance efficiency. In short, zentrak Asset & Maintenance Management turns asset data into genuine value for your railway network.

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