intech
an Infosys company

Innovating Rail Industry Together

Your Trusted Partner in Engineering & Digitalisation for a Connected Future

Your Trusted Partner in Engineering & Digitalisation

Rail transport is one of the central pillars of the mobility revolution. In Germany in particular, rail-based transport has a great need to modernize and catch up. Digitalisation and interconnection, CO2 reduction through new drive concepts, automated trains and ETCS are some of the current challenges and opportunities that affect new developments and existing vehicles alike.

With the increasing conversion to digital interlockings and the implementation of communication standards such as Eulynx, the railroad infrastructure is increasingly facing new challenges. In addition to a multitude of technical aspects, development and modernization are characterized by a wealth of rules, laws and industry standards. The complexity is increasing and presents railroad companies, manufacturers and system suppliers with special challenges.

"With us, you pick up speed. As equal partners, we are able to implement customized solutions with you throughout the entire development cycle."

Rainer Grimm, Director Rail

We are member

Cluster Bahntechnik

GfSE

DIE BAHNINDUSTRIE. VDB VERBAND DER BAHNINDUSTRIE IN DEUTSCHLAND E.V.

DMG gegründet 1881

VDB Verband der Bahnindustrie

Our rail competence centers: EUREF Campus Berlin, Munich (headquarters), Wolfsburg / Braunschweig, Vienna, Erlangen, Barcelona

About in-tech

We are an innovative solution provider for digitalisation in mobility and industry.

Automotive

Railway

Smart Industry

>20 Project locations

8 Countries

Picture: EUREF Campus Berlin

Our range of services

Systems Engineering

- Requirements management
- Concepts & Architecture
- Integration & Test
- Safety Engineering
- Safety Critical Software
- Electrical Engineering

Digitalisation

- Software development
- UX / UI
- Cloud & IoT
- Mobile Solutions
- Communication & Backend
- Digitalisation consulting

Processes & Methods

- Validation
- Homologation
- Safety Management
- Product Security
- Model-based Systems Engineering

Project examples

We work interdisciplinary on future-oriented topics, such as:

- **ETCS Retrofit**
- **Software & Communication for digital interlockings**
- **ATO for streettram & mainline**
- **Systems engineering and train IT for passenger coaches**

Systems Engineering

With our extensive know-how, we support you from the concept to approval in the development and integration of systems, control technology and new functions in multiple unit trains, locomotives, passenger coaches, streettrams, light rail vehicles and metros. You would like to realize new approaches? You can count on our support!

Concepts, Architecture & Specification

- Technical project management
- Preparation of concepts
- Preparation and evaluation of specifications
- Requirements management
- Function and system architecture
- Interface specification
- System, software and hardware specifications

Integration & Test

- Test strategies and methods
- System and software test specifications
- Test bench concepts and support
- Simulation and modeling
- Test execution in the laboratory and on the vehicle

"From our experience with customer projects and a overall view of the project goal, we will support you on your way in implementing complex systems for rail transport efficiently and reliably"

André Brückmann, Technical Director Systems Engineering

Safety Critical Software

- Industry standard compliant development
- Project management and quality management
- TCMS software, vehicle controls
- Specification and implementation
- Module tests
- Software validation

Safety Engineering

- Hazard and risk analyses
- Definition of safety functions and architectures
- Evaluation of construction documents
- Safety analysis, such as FTA, FMEA and HAZOP

Electrical Engineering

- System design and component selection
- Functional circuit diagrams and schematics
- Supplier support and technical contact
- Design of cable diagrams and cable harnesses

"Thanks to our independent and transparent way of working, you can rely on us for support and still keep the overview at all times."

Florian Rath,
Team Leader Systems Engineering

Digitalisation

Railway industry is going digital. Automated driving, higher driving frequencies thanks to modern train control systems and digital infrastructure are bringing more capacity to the rails. The collection and monitoring of vehicle data create opportunities for new maintenance models and thus greater reliability and potential for cost savings.

We support you from the concept to the final product and later in operation.

"With our extensive experience in software development accross many different industries, we design your solutions for vehicles, infrastructure or classic software. Whether vehicle, infrastructure or classic software solution."

Mandy Poetzsch,
Head of Software Engineering

Software development

- Agile development for products, MVPs, prototyping
- Usability / UX design, architecture, DevOps and support
- Mobile applications and apps
- Cloud and IoT solutions
- Communication and Back End Technologies
- Data Science, Data Analytics, Data Engineering

Digitalisation consulting

- Development and operation of digital services
- Architecture and technologies
- Organizational and process development
- Change Management

Processes and methods

The rail system is complex, but it remains one of the safest transport systems in the world. With our experience in functional safety, we support you in safety management. By applying the methods of product security, we increase the resilience of the railroad system.

"The best systems develop their full potential through continuous use. In the context of rail, this requires compliance to processes and approval of the systems. Through validation, we ensure that the development conforms to industry standards, and we also accompany the approval processes."

Alexander Zistler, Team Leader Systems Engineering

Validation

- Process consulting and industry standard compliance
- Validation of vehicle software
- Creation of validation plans
- Review and evaluation of qualification and validation documents

Assessment and approval Support

- Development of an assessment and approval concept
- Approval and commissioning support
- Requirements Capture
- Scope Split
- Process consulting and training

Safety Management

- Process consulting and training
- Safety Audits
- Documentation for verification
- Interface management with specialist departments, assessors, suppliers and customers

Product Security

- Product Security Management and Process Consulting
- Preparation of documentation for verification
- Hazard and risk analyses
- Threat Analysis & Risk Assessment
- Attack Tree Analysis

Modelbased Systems Engineering

Model-based approaches in development create structure, transparency and consistency in the interdisciplinary development of complex products and product lines completely independent from document-based approaches. We support you in the targeted introduction and implementation for collaboration at a new level.

Process, methodology and tooling

- Development of pragmatic MBSE solutions from process to methodology
- Gap analysis, concept and business case
- Conformity to industry standards, including safety and security domains
- Integration of product line development and variant management
- Tool selection, customization and integration into your tool chain
- Training and coaching of users, roll-out support

Modelbased System development

- Active support in the creation of models in the projects
- Modeling of functional, logical and physical architectures, chains of action and system behavior
- Linking requirements and architecture at model level

Beaten down by complexity?
Modelbased Systems Engineering helps!

We accompany your ETCS retrofit

Engineering and integration

- Analysis of existing vehicles, integration concept
- System and component selection, installation concept
- Electrical and mechanical design
- Software Engineering, System integration, Systems Engineering
- Necessary individual developments, e.g.: Relay boxes, displays

Test and acceptance

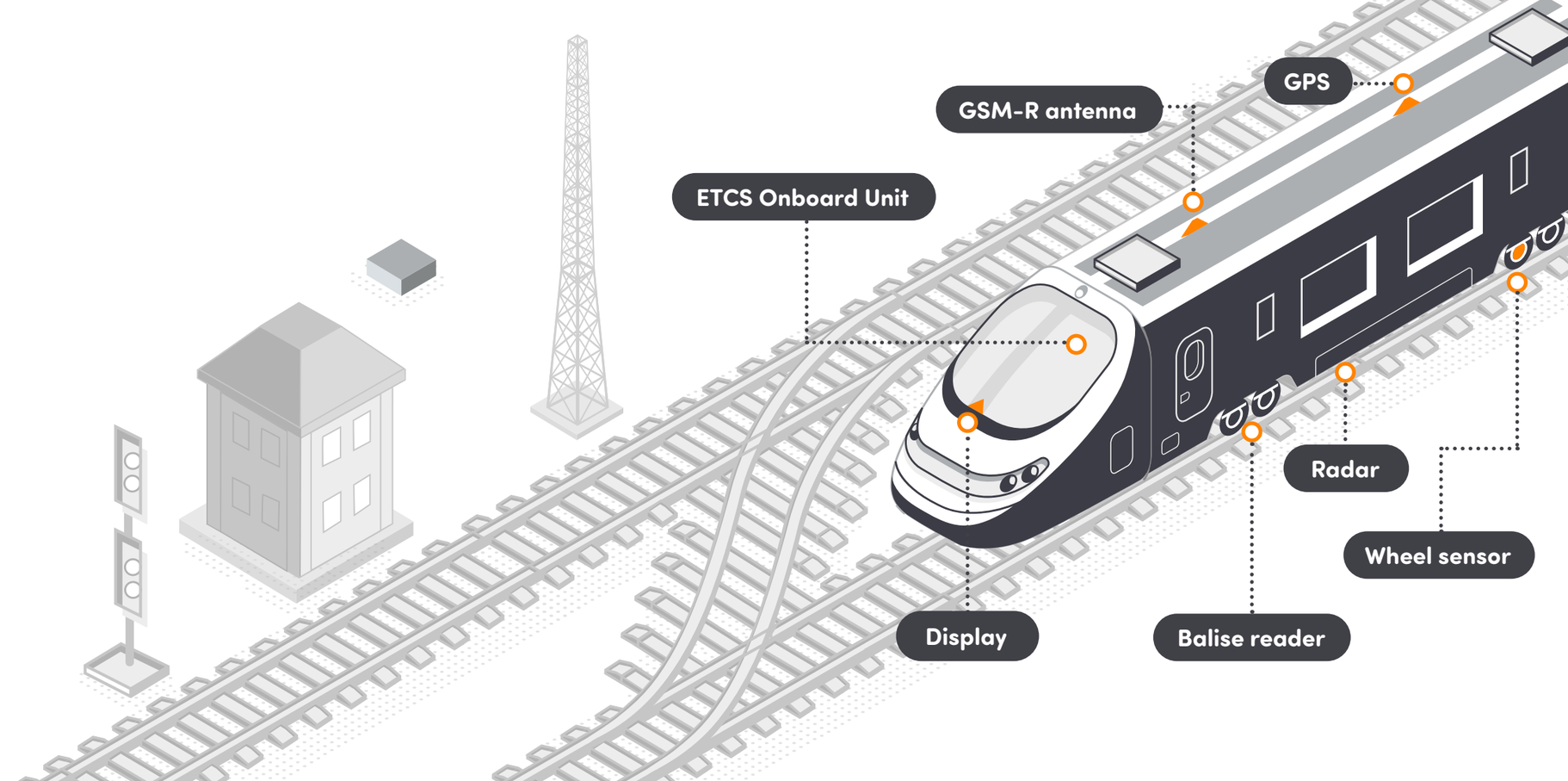
- Test and acceptance concept
- Test planning and implementation
- Commissioning and support during trial operation

Retrofit

- Conversion and retrofitting with workshops and partners
- Series retrofit

Approval and Safety

- Planning and implementation of the approval
- Safety Management and Engineering



Software & Communication for digital interlockings

Software development

- Extension and maintenance of inventory software
- Development of new software components
- Software Engineering
- Use of different programming languages and communication protocols

Test

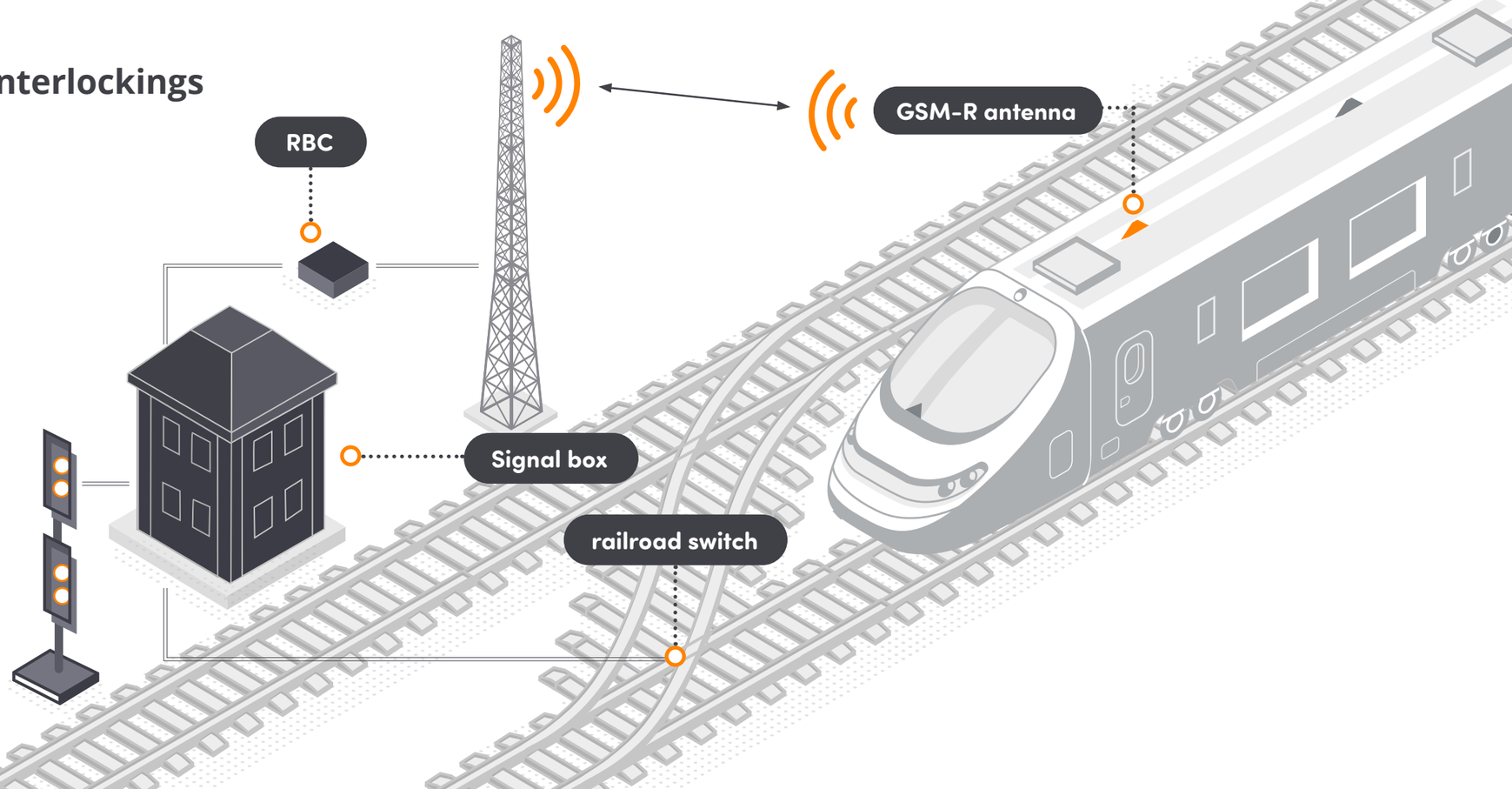
- Testing of existing software and new software components
- Creation of test documentation

Verification

- Verification of software components
- Evaluation of traceability and code coverage

Approval and Safety

- Planning and support for the assessment process
- Safety Management and Engineering



Welcome to the
#nextlevel

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