

# InnoTrans 2020 Report



B2B-Magazine for the Railway Industry

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**THEME  
IN FOCUS**

**RAILWAY  
INFRASTRUCTURE**

**Rails for the future**

Environmentally friendly mobility will be the topic of the decade. Therefore, existing rail infrastructures must become more available in order to cope with the expected capacity increases.



**5** The voice of the customers  
60,000 new seats for modernised German ICE 3 and ICE 4 trains as a result of customer feedback: Passengers were strongly involved in the development of the new seats.



**8** FRMCS – new communication  
The amounts of data are ever increasing, digitisation is advancing. The path from 2G-GSM-R technology to a more powerful version is a lengthy one.



**10** Maglev rethought  
Will it be the solution to urban mobility problems? The TSB is offered as a turnkey package and aims at scoring with low construction and operating costs.

## Bus Display at InnoTrans



Exhibitors focus on low-emission transport alternatives.

Photo: Messe Berlin GmbH

At the end of November 2019, the European Parliament declared a climate emergency for Europe. The declaration of intent from Strasbourg implies an urgent need for action, also in the field of mobility. In urban areas, electric buses offer an opportunity to make city transport more sustainable. At the InnoTrans Bus Display 2020, international bus manufacturers will be presenting their emission-free vehicles in the unique exhibition area in the centrally located Summer Garden. The 500-metre long test track offers visitors the opportunity to experience the innovations of electric mobility in their element. InnoTrans Director Kerstin Schulz: “The Bus Display offers our trade visitors exciting insights into the technological progress of electromobility in buses. The development potential of alternative drive systems is clearly demonstrated by rail transport. At the Bus Display, international exhibitors will present how bus transport can also be systematically made more sustainable.

**Big rush**

Exhibitors already registered for InnoTrans 2020 include EvoBus, Ebusco, Deltabus, Ferrovie dello Stato,

Anadolu Isuzu Otomotiv, K-Bus, LLC “PC Transport Systems”, LOHR Industrie, VDL Bus & Coach and the pioneer of the first hour, Solaris Bus & Coach. The Polish company Solaris Bus & Coach has been an exhibitor at InnoTrans as early as in 2008 and has become a permanent participant in the Bus Display since its premiere in 2016. Solaris Deputy CEO Petros Spinaris confirms the growing interest of trade visitors in electric buses: “We all observe a constant increase in demand for e-mobility solutions in public transport. As a European leader in e-buses production, Solaris puts in all the efforts to develop its innovative products. By creating the Bus Display platform, InnoTrans has become one of the most important arenas for our company to promote zero-emission solutions to the market.”

The Dutch company VDL Bus & Coach is also focusing on sustainable aspects at InnoTrans 2020. “With our sustainable mobility solutions we aim to significantly contribute in making our cities more livable, now and in the future. Innovation and cooperation with our international customers, suppliers and other chain partners are the most important drivers for achieving our ambitions. The InnoTrans Bus

Display is a high-quality international showcase to meet our international stakeholders,” says Alex de Jong, Business Manager Public Transport at VDL Bus & Coach.

**InnoTrans becomes more international**

The international interest in InnoTrans 2020 has increased compared to InnoTrans 2018. For the first time a Malaysian joint booth will be presenting the technological innovations of the Southeast Asian state. Alongside Malaysia, Indonesia, Serbia and Israel are recording the strongest growth in the number of exhibitors. With their companies they offer trade visitors to InnoTrans exciting technical achievements and some groundbreaking world premieres. The Kingdom of Saudi Arabia is also experiencing a premiere. SAR is the first company from the Arab Kingdom in history that exhibits at InnoTrans. Saudi Arabia thus joins the long list of international exhibitors at InnoTrans, which impressively underlines InnoTrans’ reputation as the world’s leading trade fair for transport technology. This is also confirmed by the steadily rising number of exhibitors from foreign trans-

port companies. Most of the exhibitors at the coming InnoTrans are from China, as well as Great Britain, Spain and Russia. A detailed overview of the exhibitors already registered can be found online at [www.innotrans.com](http://www.innotrans.com). There you will also find a list of exhibitors in the new Mobility+ theme area, which has attracted a great deal of international interest. The new area focuses on transport solutions for the first and last mile as well as on combined mobility and digital support approaches.

It is not only Mobility+ that will be celebrating its premiere at InnoTrans 2020, but also the new hub27 exhibition hall, which was completed in 2019 and where exhibitors at InnoTrans 2020 will be presenting their innovations in signalling technology. From March onwards, anyone wishing to experience the innovations in mobility can purchase tickets for InnoTrans online in the Ticket Shop. At the end of November Alena Conrads was already delighted to receive her first ticket for the world’s leading Trade Fair for Transport Technology. She won the InnoTrans Career Award presented by STUVA and will be travelling to Berlin at the end of September.

**COMMENT**

**No traffic turnaround by 2030 without buses**

Martin Schmitz,  
VDV Managing  
Director  
Engineering

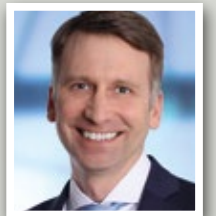


Photo: VDV

This fact is well known among professionals, but there is mainly talk about their big sisters: urban and main line railways. It goes without saying that these will play a key role in an emission-free, space-saving future mobility. However, the long lead times to design, plan and build new lines are also undeniable. Rail alone will not be able to sufficiently reduce greenhouse gas emissions in the short term. It is clear that the bus of the future must be emission-free. The technological progress is impressive: a realistic medium-term scenario shows area-wide hydrogen bus operations while e-buses operate in cities. German transport companies are currently converting primarily to battery-powered buses, despite the high additional costs per vehicle and – often forgotten – for the e-infrastructure. The conversion is expensive. Numbers would increase more quickly if the federal and state governments were to provide more support. New drives are one thing. But even a modern diesel bus is part of the solution: only a few transport politicians seem to notice that the bus is tied up in chains that limit its attractiveness since a bus in a car traffic jam makes no sense. Rapid bus systems offer fast, inexpensive solutions. They prove successful in practice, but not yet in Germany. There are shining examples in South America, Asia and in our neighbouring France, under the name ‘BHNS – Bus à haut niveau de service’. There, urban motorways are being deconstructed and separate bus routes are set up, with effective priority for buses and with a consistent brand identity. This results in bus systems with light rail quality, without traffic jams, but with a high level of acceptance. This is the path to be taken in Germany.

■ The BerlKönig has been on the streets of Berlin since September 2018. In contrast to Goethe's well-known ballad "Erlkönig", BerlKönig is a ridesharing service. The cooperation between the American company ViaVan and Berliner Verkehrsbetriebe (BVG) offers travellers the opportunity to cover the first or last mile without complications. The shared transit service books around 2,000 trips per day, with a total of more than 750,000 trips since its foundation, and is currently used by 70,000 Berliners. At InnoTrans 2020 ViaVan is one of the first exhibitors in the new Mobility+ platform. Mobility+ will be integrated into the Public Transport Segment in Hall 7.1c and will focus on the transport fields of shared mobility, combined mobility and digital mobility platforms.

Chris Snyder, CEO of ViaVan, sees great potential in Mobility+ for making new international business contacts: "We're thrilled to attend InnoTrans 2020 and showcase what's possible when you focus on transforming mobility with technology." Complementing the offer of ViaVan, Arvato Financial Solutions, Bestmile, BVG, cantamen, d-fine, Door2Door, GREMOVE, ioki, ISTMobil, Mobimeo, MotionTag, Uber Germany and



... and smart solutions for the first and last mile.

Photo: Mikko Lemola/iStock

Zeitmeilen will present their mobility concepts.

### Mobility+ exhibitor wins German Mobility Award 2019

The mobility start-up ioki brings on-demand mobility and auto-

mous driving to public transport. The subsidiary of Deutsche Bahn has set itself the goal of using flexible on-demand solutions to make public transport more individual and strengthen it sustainably through intelligent ride-pooling solutions. In this way ioki is meeting a central challenge

in public transport. The lack of offers for the first or last mile therefore leads many travellers to decide against public transport. The aim of ioki is to close this gap and to relieve traffic through mobility that meets the needs of the passengers. In both urban and rural areas, the aim is to

create comfortable, seamless connections with optimum capacity utilisation.

With this concept, the young company won the German Mobility Award at the end of November for the ioki Hamburg project, which was implemented together with the Hamburg Holstein Transport Authority (VHH). For InnoTrans 2020, ioki plans to present its concept to a larger international market.

Ioki Managing Director Michael Barillère-Scholz underlines the ambitious plans of his company: "With data-based mobility analyses and networked offers to strengthen public transport, we want to realise our vision of sustainable, demand-oriented mobility that is available at any time. It is our aim to show present new mobility solutions to cities, municipalities, transport associations and companies and to support them as a strong technology partner on their way to the mobility turnaround."

The Mobility+ Forum will take place for the first time on 25 September 2020 at InnoTrans. It offers a forum for the exchange of ideas on current digital and infrastructural challenges.



MES Expo 2019 – Ribbon Cutting: Dr. Christian Göke, CEO, Messe Berlin GmbH; Olaf Zinne, Managing Director, Electric Traction Systems and Vehicles Division at ZVEI e.V.; Dr. Ben Möbius, General Manager, Verband der Bahnindustrie in Deutschland (VDB); Liu Zhenqing, Deputy General Manager, General Electro-Mechanical Business Department, CRRC; Dr. Heike van Hoorn, CEO, Deutsches Verkehrsforum e.V.; Andreas Wagner, CEO Germany, Mitsubishi (l.t.r)

Photo: Messe Berlin GmbH

The progress of digitisation and electrification opens up numerous new and dynamic design options for future mobility systems. 54 exhibitors from 11 nations showed how these can be used effectively at the premiere of the MES Expo from 5 to 7 November 2019 in Berlin.

■ The trade fair concept covers all transport systems and is aimed at the electronics supply industry. For the first time it offered a platform for interdisciplinary exchange to exhibitors and trade visitors from the railway, commercial vehicle and automotive sectors.

The exhibitor portfolio of the first event offered trade visitors a wide range of products and services that

covered all sectors of the industry. In addition to world market leaders such as Knorr-Bremse or CRRC, numerous medium-sized companies such as KUKA or INOVA Semiconductors presented how their products are actively contributing to the transformation of mobility. The fair was also enriched by creative impulses from up-and-coming start-ups. For Andreas Wagner, President of the

German branch of Mitsubishi Electric Europe, MES Expo offered added value, especially with regard to intermodal transport solutions: "When we think about mobility, we believe that it should be seamless and intermodal in the future, and in particular that it must offer added value for users. The MES Expo reflects this trend very well and clearly illustrates the change in mobility".

The MES Expo project manager, Lisa Höfer, was very satisfied with the premiere: "The attendance figure of 1,315 representatives of the sector more than exceeded our expectations for the debut event. Our concept of creating a strong B2B-platform with the MES Expo has been successful. 80 percent of our visitors have an advisory influence on purchasing and procurement decisions in their company. This speaks for the high quality of the trade fair."

### Great interest in the supporting programme

A further highlight of the trade fair was the supporting programme. This was particularly supported by the three partner associations VDB, ZVEI and DVE. At the Dialog Forum and the Procurement Center, companies such as Siemens Mobility, Bombardier Transportation or Deutsche Bahn reported about their current opportunities and challenges in the mobility sector. "We have succeeded in demonstrating that the innovative strength of these industries can make a huge contribution to a more efficient mobility that is less polluting and more efficient across all modes of transport," says Olaf Zinne, who heads the Smart Mobility platform at ZVEI. "If you look at the German electrical industry alone, it represents a highly innovative sector with up to 17,000 patent applications per year – some of these patents are the basis for digitalised and smart applications, for example in the automotive sector. And the

influence of this industry is increasing from year to year – today vehicles consist of a large number of microchips or semiconductors – all of them are products of the electrical industry," continued Zinne.

The next edition of the MES Expo will take place in Berlin from 9 to 11 November 2021.

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## GUEST ARTICLE

## PHILIPPE CITROËN

UNIFE Director General



# Digitalisation, urban mobility and the future of European railways

Everything is going digital, why should railways be an exception?

Everything is going digital, why should railways be an exception? As we face growing climate change and a move towards urbanisation that has the potential to exacerbate it, the digitalisation of the rail sector will ensure the transformation of rail transport, the greenest mode of mass transportation, into the backbone of mobility, thus contributing to the 'Green Deal' which is part of the mandate of the President of the European Commission, Ursula von der Leyen.

Presented in December 2019, one of its objectives will be to shift 75 percent of freight traffic from road and aviation to rail and inland waterways by 2050. End customers, passengers and freight alike, will only begin to prefer rail when it is the most accessible and efficient option. This will require the implementation of new adaptable rail solutions and the fast deployment of payment, automation

and communication technologies that will allow them to quickly, frequently, affordably and knowledgeably use rail transport as the preferred mode of their daily travel and shipments.

This is critical as transport is the sector that currently emits second most in terms of greenhouse gas (GHG) emissions, surpassed only by energy production. It is responsible for nearly 24 percent of Europe's emissions. Transportation is also the only sector that has increased its emissions on the continent over the past 20 years. Road transport is the biggest polluter, with 40 percent of those road emissions being emitted in urban and suburban areas. However, rail does not conform to this trend.

Rail is the only mode of transport that has diminished its emissions while increasing the number of passengers. With its high capacity and

limited emissions compared to road transport, rail has the potential to get millions of cars out of the urban and suburban areas in which they create significant traffic congestion that reduces mobility and drastically increases emissions that affect the health of both citizens and our planet. This inherent value makes the rail sector a crucial ally in the effort of President Ursula von der Leyen and her Commission to make Europe carbon-neutral by 2050.

## Investment in digital systems

Building extensive digitised rail networks is an executable objective to that end. Using new technologies like automation, big data, artificial intelligence and next-generation telecommunication solutions, we can create an attractive mobility paradigm

centred on rail and its widespread infrastructure. Digital solutions will make it possible for users to easily pay for rides, routing and planning trips and find last-mile transit solutions at stops. It will also allow Europe to efficiently plan services that can optimally synchronise urban, suburban and mainline rail to make it more convenient than other more carbon-intensive alternatives like personal vehicles. This will permit increasingly inhabited municipalities to enjoy a renewed city planning in order to benefit from greater economic growth and more social cohesiveness.

To make this vision a reality, the EU will need to craft a truly interoperable Single European Rail Area and properly invest in, and deploy, the digital systems that will enable it. The widely – but not yet universally – deployed ERTMS is one solution that UNIFE has identified as a key ena-

bler to allowing greater and more seamless rail travel across Member States. Its widespread usage will be the foundation for the adoption of upcoming ERTMS game changers like ATO, ETCS Level 3, next-generation telecommunication and satellite positioning systems being developed, or already developed, through Shift2Rail projects. This private-public partnership, led by its Executive Director Carlo Borghini, has made significant strides towards these technologies and should be extended as Shift2Rail II under the EU scientific research initiative 'Horizon Europe'. Permitting the programme's continued operation would help fund essential research and innovation that will lead to new technologies that will make rail even more effective during the ongoing ecological transition.

UNIFE looks forward to partnering with the European Commission and the other EU institutions during this new mandate. Our sector has much to bring to the table as the Commission crafts an ambitious 'European Green Deal' that will also make an economy that works for people. Our association urges policy makers to work alongside the European rail supply industry to digitise the railways and bring the benefits even more into citizens' everyday lives.

UNIFE will be present at InnoTrans 2020, please join us to learn more about the digitalisation of our sector, the future of urban rail, and much more.

# Digitalisation, sustainability and citizen-friendliness

The digitalisation of transport will shape and change the mobility of both society and economy in the coming years. The aim is to harness the potential of all modes of transport in order to improve the mobile everyday life of all EU citizens, to strengthen sustainability and climate protection in transport and to secure the competitiveness of European industry by means of digital networking and the use of mobility data.

Europe's declared goal is to be a global pioneer in the digital economy. The Federal Ministry of Transport and Digital Infrastructure also wants to set priorities in the areas of digitalisation, sustainability and climate protection for the EU Council Presidency beginning in July 2020. To this end, European rail freight transport is to

be strengthened in order to promote a climate-friendly and efficient freight transport.

"I want modern, environmentally friendly and clean mobility – in the countryside as well as in the cities. For this we need a close exchange. Taking people's concerns and habits seriously – that is our duty. We will only succeed in protecting the climate if we take the issues to everyone," said Federal Minister Andreas Scheuer.

The framework for the German EU Presidency is set by the Federal Government's programme, which is currently being drawn up under the auspices of the Federal Foreign Office. It is closely linked to the work programme of the new EU Commission.

One of the Federal Ministry of Transport's key objectives for 2020

will be to modernise the Rotterdam (2016) and Vienna (2018) declarations at a ministerial conference in Berlin on 21 September 2020 and to achieve progress in rail freight transport in the form of a 'Berlin Declaration 2020'. After all, rail freight transport and modern corridors are still essential today for competitiveness and for the implementation of transport goals, especially those regarding modal shift.

A further focus of the ministerial conference will be to anchor the topic of "innovative freight transport" more firmly at European level. The aim is to take concrete measures to make the logistics sector more future-proof throughout the EU by means of innovation.

Following the ministerial conference on Tuesday, 22 September, the EU



Andreas Scheuer – Federal Minister of Transport and Digital Infrastructure

Photo: BMVI

ministers are invited to the Opening Ceremony, the Rail Leaders' Summit and a political network meeting hosted by Federal Minister Andreas Scheuer at InnoTrans. The aim of the network meeting is the exchange between

EU ministers and their international colleagues on European approaches and global transport issues. The ministers will take part in the VDB reception on the eve of the fair that will be held on Monday evening, 21 September.



By means of an app, passengers can consciously opt for an electric vehicle for a ride.

## ViaVan and Shell launch shared ride in Amsterdam

Photo: Miguel Gonzalez

ViaVan Technologies B.V., Europe's market leader for public mobility, and Shell are launching an innovative electromobility project in Amsterdam, combining ViaVan's expertise in on-demand mobility technology with Shell's capabilities in charging solutions. The aim is to demonstrate the feasibility of deploying electric vehicle fleets in urban environments.

■ The programme will integrate the on-demand technology and operation of ViaVan, Shell's rapid charging technology and the associated charging

stations into a single system. ViaVan and Shell will demonstrate that high performance electric fleets can improve their performance by optimising

the transfer to available charging stations. ViaVan's electric vehicle operating system includes a powerful routing algorithm that maximises the range

and battery performance of electric vehicles. In Amsterdam, the system will monitor the real-time battery status of all vehicles in the fleet, calculate upcoming charging tasks and route vehicles intelligently to one of Shell's rapid charging stations. This will make the electric vehicles an efficient part of the public transport network. Passengers can book their ride in an electric vehicle in the ViaVan mobile app via an eVia request.

### Electric mobility complementing public transport

The use of such an operating system for electric vehicles offers municipalities considerable potential for a better overview of the electricity network in the urban area. ViaVan works closely with cities and public transport companies and offers ride-sharing and electric mobility services that complement the existing transport infrastructure.

In Berlin, ViaVan supports and operates a fleet of on-demand shuttles, most of which are electrically powered, in partnership with Berliner Verkehrsbetriebe (BVG) – the largest public use of shared shuttles worldwide. In Milton Keynes, UK, ViaVan's on-demand service will be fully electric by 2020. ViaVan's comprehensive solution offers its partners the opportunity to introduce zero-emission public transport using e-shuttles.

### Experienced project partners

ViaVan is a joint venture between Via and Mercedes-Benz Vans. There are already more than 90 implementations of Via technology in 20 countries worldwide, with more than 70 million journeys made to date. Shell is committed to the future of electromobility in the Netherlands and announced that it will accelerate the expansion of the 'Shell Recharge' fast-charging infrastructure. In the coming years, the Shell Recharge network will be expanded to 200 charging stations throughout the Netherlands.

ViaVan Technologies | Hall 7.1c | Mobility+



Photo: ViaVan B.V.

# Information displays: A single product for all applications

Displays for customer information and entertainment are indispensable for transport providers, not only to display current operational events, but also as advertising and entertainment platforms.

■ The Finnish Teleste Corporation offers a broad portfolio of product and service solutions for this purpose, including RGB LED information displays. They are suitable for outdoor applications, including central, platform, hall and even timetable displays.

### Technology for high expectations

These Teleste RGB LED displays are designed for permanent use: around the clock and all year round; their IP65 protection protects the displays against dust, rain and even snow. The integrated thermal management system ensures that the operating temperature is within the range of -35 degrees Celsius to +55 degrees Celsius. In addition to low energy consumption and a

service life of 100,000 hours, the information displays offer a wide

range of pixel pitch options from 2.5 millimetres to 10 millimetres

and a luminance of up to 6000 candelas per square metre. This ensures

an excellent full colour readability from all viewing angles for symbols, scrolling texts and even videos. The brightness is automatically adjusted according to ambient light. The RGB LED displays are equipped with an industrial quad-core PC, there is a front access for maintenance. They can be operated with either 115 or 230 volts alternating current. Together with iqu Systems, its German subsidiary, Teleste will supply 462 RGB LED information displays to Kölner Verkehrs-Betriebe AG (KVB) this year. They will be used throughout the city of Cologne's light rail network; the installation of the displays at KVB's stations and platforms will be carried out by teams from the German Teleste service company Cableway.



In Canada, the displays have already proven themselves on Vancouver's Millennium Line

Photo: Teleste Corporation

## Seat rebuild for ICE 4 and ICE 3 trains to start in March



These new seats are the result of customer feedback.

Photo: DB AG / O. Lang

Comfort plays an important role when travelling, complementing punctuality and reliability. The findings of customer feedback on the seats in the German ICE 4 and the modernised ICE 3 high-speed trains were all the more thought-provoking: too hard, seating surfaces too short, insufficient freedom of movement in the head and shoulder areas.

## A passion for beautiful design and functionality



WC cabin in the Luxon special coach of RailAdventure

Photo: RailAdventure GmbH

With its products from Switzerland, Systemtech Schneider AG proves that convenience and beautiful design can belong together.

With a devotion to details, shapes and materials, the company develops and implements overall concepts for railway rolling stock. With the various wall, floor and ceiling elements made of composite panels, entire family or sleeping compartments up to dining cars are designed and implemented to satisfy customer requirements.

The interior fittings are an essential part of the product range, but the most famous product is the Toilino®.

### Modular system

Toilino® is a modular WC system in various versions – from simple to luxurious, with or without urinal. Special designs such as (family) cabins with

shower are also possible. All cabins are comfortable and designed for passengers with reduced mobility. The complete project development, including engineering, prototyping, production, assembly and service, is completely carried out from a single source and without any external service providers. Customer-specific developments not only take into account the wishes with respect to design, colours, illumination and technical specifications, but they also include the aspects of functionality and aesthetics in addition to weight optimisation through lightweight construction. Systemtech produces full-size railway car and compartment models upon customer request. These mock-ups are used to present technical solutions,

design and functionality in a realistic way for illustration purposes.

### All requirements are met

In order to fulfil customer requirements, it is essential to comply with the respective country-specific standards, as well as the TSI specifications. The certification according to the valid standards of the railway industry (fire protection, bonding, welding, etc.) are fulfilled and constantly supervised by the compliance department. The full scope of supply of the Toilino® modules includes a complete set of documentations as well as the corresponding training offers.

Systemtech Schneider | Hall 1.1 | 640

This made it clear that further development is needed to take into account the main criticisms of the users, in order to improve passenger comfort. A new approach was chosen for this: The seat manufacturer Clerprem Deutschland GmbH, the German subsidiary of the Italian Clerprem SpA, cooperated with the Ergonomics Institute Munich and developed three prototypes and had 600 test persons try them out in the seat laboratory. The result: all three prototypes were rated better than the original seats.

Subsequently, new seats were installed in two ICE trains in regular service and 5,800 passengers were interviewed – one of the prototype alternatives won the race.

### The changes in detail

The most fundamental change to the new seats is a significantly softer seat foam including a new 'memory foam' support in the seat and backrest upholstery. In addition, optimised cushions have been provided for a better resting position in the neck area and overall

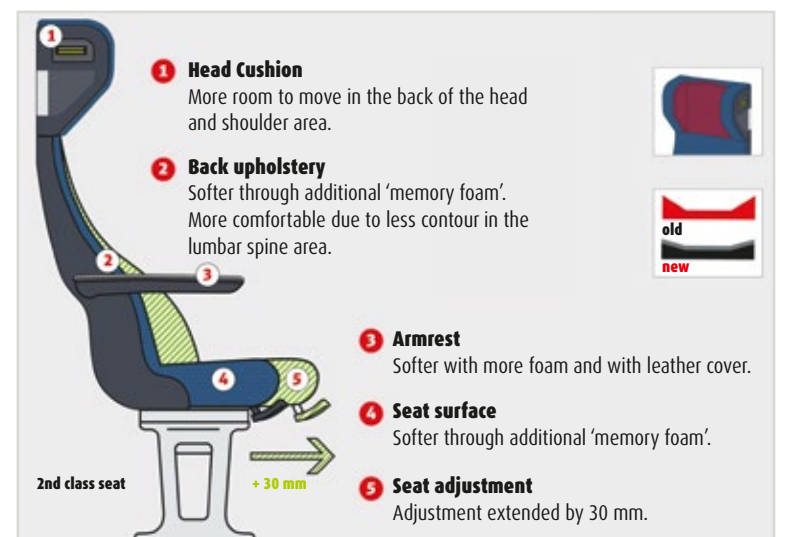
more freedom of movement in the lower back due to fewer contours in the lumbar region was given. Further feedback from customer surveys: In the case of the 2nd class seats, a further three centimetres were added to the adjustment system compared to the criticised seats. In 1st class, the effective seat surface was increased by three centimetres.

The armrests of the seats in both classes were given a genuine leather cover and better upholstery. Pillows have also been improved and newly designed pillowcases that have been tested with customers will also be installed.

### From domestic production

The seats will be manufactured at the Clerprem Deutschland GmbH plant in Neustadt, Saxony, and a total of just under 60,000 seats will be installed in the modernised ICE 3 and ICE 4 trains from March 2020 onwards. The order has a volume of around 40 million Euros and should be completed by the end of 2021. Then nothing will stand in the way of comfortable seating on rail journeys.

Clerprem | Hall 1.1 | 440



All improvements at a glance.

Graphic: DB AG

Ad

## CLARIANT

### Innovative rail solutions FIRE, SMOKE, AND TOXICITY COMPLIANT 3D PRINTING MATERIALS

PA6/66-GF20 FR LS is a newly developed flame retardant 3D printer filament that complies with EN 45545-2, NFPA 130 (ASTM E162, ASTM E662), and SMP 800-C. Rail customers can now economically and efficiently 3D print numerous part types including replacement, small batch, and complex parts.

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what is precious to you?

THEME  
IN FOCUSRAILWAY  
INFRASTRUCTURE

## A closely timed future

Existing rail networks must be future-proof, and therefore everything currently revolves around IoT, AI and Industry 4.0: better availability through condition-based maintenance of tracks or turnouts, sensors for comprehensive data collection and automated production.

IoT and artificial intelligence  
for predictive maintenance

Small component - big effect

Photo: Konux GmbH

At InnoTrans 2018, KONUX GmbH presented the Predictive Maintenance System for turnouts - an end-to-end solution that uses IoT sensors and artificial intelligence (AI) to improve network availability, extend plant life and reduce costs.

The KONUX system continuously monitors and analyses the condition of key turnout components and de-

livers practicable findings. It thus enables better maintenance planning by helping infrastructure operators to

detect failures at an early stage and plan the optimum time and type of maintenance required. Since then, further important milestones have been achieved.

## New components

The switch frog has been added to the system as a new monitored component. Due to its characteristics, the frog is the component with the highest

wear and tear. The KONUX Predictive Maintenance System now detects anomalies of the vibration data in the area of the frog, so that measures can be planned in time to avoid more serious and costly damages. The market launch of the solution for monitoring the condition of the turnout drive is planned for summer 2020. This will address 58 percent of the delays caused by this switch component.

## New functionalities

Thanks to advanced algorithms in machine learning, a prediction can be made of how the condition of the track bed will develop over a period of 90 days; the hit rate is 90 percent. This allows the actual effect of maintenance measures such as tamping, grinding/planing or welding to be validated. 100 percent of the trains running over the points around the clock are detected. This allows infrastructure operators to optimise maintenance planning, avoid downtime and extend the service life of their equipment - without sending anyone to the track or disrupting normal operations.

## Next generation IoT sensor

The battery life of the IoT sensor in the field has been doubled from two to

over four years and the range of acceleration measurement has been quadrupled without compromising the measurement resolution. In addition, it becomes possible to optimise the device management system, the process of device activation, the setup and firmware deployment Over The Air. All this helps to make major rollouts fast and efficient.

Konux | Hall 23 | 470

## NEWS

Know today what will  
happen tomorrow

The future of rail operations and maintenance of the rail network lies in the use of the huge amounts of data generated in a network. Strukton Rail BV from the Netherlands therefore takes a preventive approach to rail asset management, in which network data is collected, secured, analysed and interpreted. For rail infrastructure operators, this means maintenance efficiency and extended facility life, an overview of future requirements for the renewal of equipment, real-time data, cost-effective and safe execution of maintenance work, operational flexibility and adaptation to changing market conditions. This results in safer and more reliable rail networks. Strukton's smart maintenance approach is based on 100 years of experience in the construction, renewal and maintenance of rail infrastructure, power supply, catenary systems and signalling. Customers can also draw on the expertise in the field of vehicle electronics when infrastructure and rolling stock are to be increasingly networked with automatic train operation, ERTMS, CBTC or energy integration.

Strukton Rail Nederland | Hall 26 | 570

## ENGIE acquires Powerlines Group

The Powerlines Group with its subsidiaries is one of Europe's leading system providers of railway electrification for local and long-distance networks. ENGIE is a global provider of low-CO<sub>2</sub> energy and services.

In response to the urgent challenge of climate change, ENGIE aims to be a global pioneer in CO<sub>2</sub> reduction and a leading force in shaping the energy revolution. Since it was founded, the Powerlines Group has enjoyed an extremely dynamic growth thanks to its clear strategic focus on internationalisation, diversification and professionalisation. In October 2019 the Austrian Powerlines Group announced the takeover of the group by the French ENGIE Group. In the past financial year the Powerlines Group generated

revenue of over 300 million Euro with over 1,100 employees.

The acquisition combines two companies with a common vision: climate-friendly and reliable turnkey solutions for future mobility. The railway sector is a crucial lever for achieving the European climate goals. The electrification of rail networks is one of the main pillars in the decarbonisation of public transport. With their joint expertise, ENGIE and Powerlines will accompany and support their customers in solving their energy challenges by implementing complex turnkey projects and integrated solutions for future mobility. Based on the 'as a service' model - financing, design, implementation and maintenance - customers will

The Powerlines Group, system supplier for railway electrification is now part of the French ENGIE Group.



Photo: Powerlines Group GmbH

receive a comprehensive range of services. At InnoTrans 2020, the newly created ENGIE Solutions unit within the Group will be presenting itself as a system provider at a joint

booth with Powerlines, Icomera, Ineo Rail, Ineo Systrans, Ineo UTS, ENGIE Axima and Ineo SCL, all of which are active in the transport sector.

Powerlines Group / ENGIE | Hall 22 | 340



Maintenance work during the night - thanks to preventive maintenance.

Photo: Bonifotografie

The new plant in Schwandorf



## Turnout sleeper production with Industry 4.0

RAIL.ONE Schwandorf GmbH, a subsidiary of the internationally operating PCM RAIL ONE AG, has opted consistently for Industry 4.0 in its new plant in Schwandorf, Germany: a highly automated manufacturing plant technology, in conjunction with digitalised order processing, enables a continuous production of even small batch sizes, while at the same time offering very short retooling times.

■ A completely new production process was developed for the new plant. Many processes that were still carried out manually in traditionally oriented production methods have been replaced by state-of-the-art joint-

ed-arm robots and automated portal and transport systems. The machines and moulds that are used in production communicate continuously with a master computer that provides all the information for production. The mas-

ter computer, in turn, is in constant communication with the company ERP system. The customer benefits at the same time from the great flexibility of the contractor and the highest quality. Even short-term orders or

changes can be put through to production within minutes. The result is impressive: The productivity is almost twice as high as with conventional production methods. But also accompanying processes, such as the acquisition of data for quality assurance or for the control of maintenance, are significantly more efficient due to the high degree of digitalisation. The production plant will mainly supply the South and South-East Regional Areas of DB Netz AG with concrete turnout sleepers and, with an annual production capacity of up to 180,000 metres, will also offer storage facilities of more than 20,000 metres.

The basis for the construction of the plant was a tender issued by DB Netz AG for the production of up to 180,000 running metres of pre-

stressed concrete turnout sleepers per year over a total period of 15 years.

### Ideal location for improved track construction site logistics

The contract was awarded in autumn 2017 and construction of the new plant began one year later. It is located on the premises of Deutsche Bahn AG in Schwandorf, a railway location with a long history. The production of concrete turnout sleepers is thus an ideal complement to the site where turnouts have been manufactured for many years. Furthermore, the close proximity to the DB switch factory enables a better logistical supply of track construction sites.

PCM RAIL.ONE | Hall 26 | 790



Modern jointed-arm robots for higher productivity

## From planning to maintenance: infrastructure from one source

Too many cooks spoil the broth, this time-honoured saying also applies to the operation of railway infrastructures. Too many enterprises and partners often make processes and work confusing and, on balance, expensive. Amberg Technologies AG remedies this situation and offers a customised total package with its solutions, products and services: from planning to maintenance.

■ Right from the start, during the planning phase, geological surveys, 3D images of the entire area using mobile mapping as well as geo-mechanical and structural calculations provide an overall picture of the general conditions and challenges of a project. These are transferred into a Building Information Model (BIM) of the infrastructure.

This form of visualisation plays a decisive role not only in the planning, but also in the construction, operation and maintenance of an infrastructure. In the first phase, it ensures a better understanding of the complex processes of a construction project. For example, in a tunnel construction project, project participants can see both the alignment of the tunnel and the surrounding geology.

During construction, the data from geological monitoring and from the track monitoring system Track Control continuously flow back to the Amberg cloud solutions. In the constant interaction of information, for example

from seismic pre-exploration, tunnel driving control, profile control as well as current scan data or monitoring data in real time, the model grows into a digital image of the building. The

transfer of design data from the BIM for railway surveying equipment as well as the optimisation of construction site logistics, the so-called lean management, can also be integrated.

The data flow back from the construction site – that is, 'field to BIM' – and thus keep the model up to date.

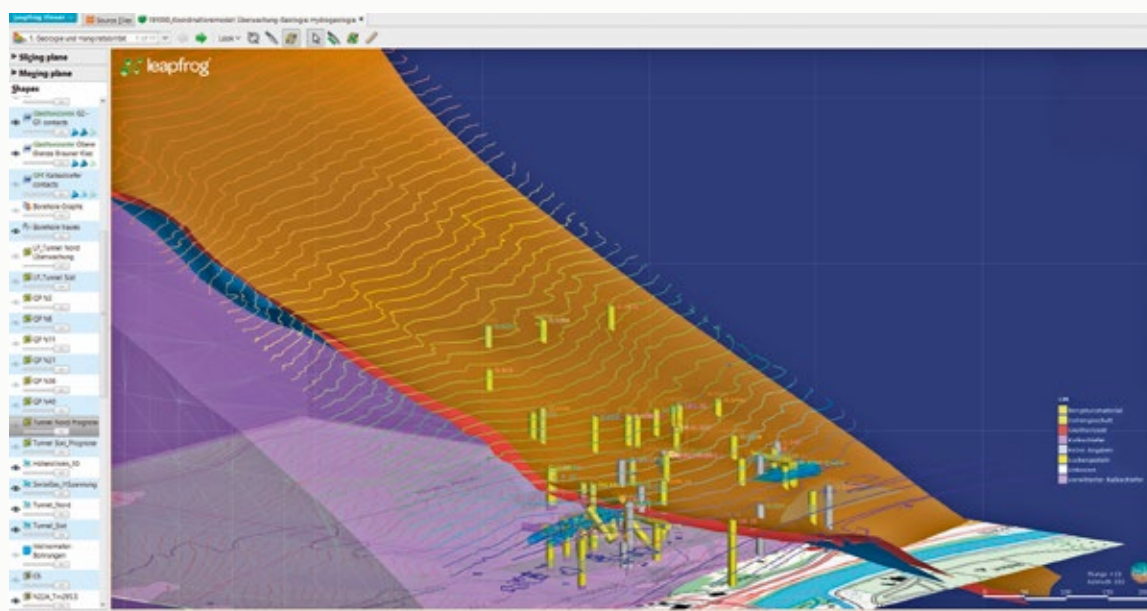
During the operating phase, comprehensive monitoring and inspec-

tions guarantee the long life of the infrastructure. By identifying and measuring changes, interventions can be planned early and in a targeted manner.

### Artificial intelligence to predict damage

This sustainable way of thinking is the inspiration for new ideas at Amberg. In future, older tunnels will be recorded in 3D, modelled, provided with further relevant information and made available as digital twins. Artificial intelligence will soon enable automated, rapid and predictive detection and prediction of possible damages.

The digital twin is the building documentation of the future. All data and models are available anywhere and around the clock. Amberg has the experience and expertise to successfully plan and implement infrastructure projects in all life cycle phases.



Representation of the geology integrated in the BIM model

Graphic representation: Amberg Group AG

Amberg Technologies | Halle25 | 455

# Railway communications of the future – FRMCS



The new digital world of railways needs an efficient system for railway communications.

Photo: Siemens Mobility GmbH

About 30 years ago, GSM-R became the standard for railway communications on the basis of the 2G-technology GSM, and hardly anyone could anticipate how breathtakingly fast the technology would change.

■ In our days, some of the 2G-functionalities appear to be almost archaic and for several diverse reasons the time has come to adapt railway communications to the changes in realities. One of them is that suppliers intend to cease their support of the 2G-technology by 2030 or in some exceptional cases by 2035. But a quickly progressing digitisation also takes place in the railway world and beyond, boosting the demands on supporting telecommunication technologies, particularly in terms of the required broadband networks.

The multitude of modern applications requires reliable, fast and undisturbed communication platforms with great bandwidths and short latencies – or response times – for the transmission of signals, that the 2G technology is unable to supply. Although the supporting systems and applications are

being adapted to the current state-of-the-art, they are nevertheless limited by the basic technology that is being used. The Internet with its functionalities has become an everyday companion for users, and particularly so for applications beyond the private use, like social media, email retrieval, route planning et cetera. First and foremost, the industry needs broadband networks in order to handle the data volumes of the technologies that are commonly known as industry 4.0.

With regard to railways, more than the current communication of a train driver with the operations centre must be possible. Railway communication technology must be able to reliably process the data volumes that are incurred by interconnected infrastructure assets and trains, the ERTMS/ETCS signalling system or the automatic operation of trains.

## FRMCS: the challenge

Future Railway Mobile Communication System, short FRMCS, was the name of the project that was initiated in 2014 by the International Union of Railways UIC, with the aim of developing a system that meets the challenges of an interconnected world of railways. The GSM network – and therefore also the GSM-R-technology was standardised under the responsibility of the European Telecommunications Standards Institute (ETSI), an institution that was created by the European Union. With the third generation of mobile phone networks UMTS, the standardisation institutes of the USA, Japan, Korea and China joined in, and for this reason, it is also called the Third Generation Partnership Project (3GPP). Meanwhile, 4G (LTE) and 5G have also been standardised by 3GPP

and the GSM specifications have also been transferred to 3GPP. For this reason, standardisation is meanwhile applied around the world.

For FRMCS, this means that now many institutions have to cooperate in this project, in order to reach an optimum. While some partners must define the requirements of the railways (UIC), others (ETSI) must describe them in Use Cases and submit them as so-called Change Requests to 3GPP. 3GPP is in charge of verifying if these Use Cases can already be fulfilled with existing standardised functionalities. 3GPP and the connected framework MCX for safety-critical applications is therefore an ideal entry point for FRMCS to enable the use of existing safety-critical services. This means a significant gain in standardisation and provides more flexibility for the future digital applications. If hitherto things seemed complicated to read, they will not become simpler: it must furthermore be exactly defined which transmission technologies and which application layers shall be used. As a special challenge, the railway sector will be

facing the coexistence of GSM-R and FRMCS as it is not possible to implement such a fundamental transition from one day to the next. The community will have to solve the special task of developing the best migration path.

## FRMCS: the future

Last year, the 5G licenses were auctioned. 5G will allow for an ultra-high-speed and reliable data transmission: the latency of the 5G technology is anticipated to be as short as a mere millisecond (for comparison: 3G-network have a latency of about a hundred milliseconds). This means that data can be transmitted almost in real time. Nevertheless, for the time being it has not been clarified yet which bandwidths and frequency ranges will be available for railways. The decision is expected during this year and national regulation bodies will then be able to implement them. It is only on this basis that the final configuration of FRMCS as the future communications system for the European railways will be possible.



## LED lighting solutions for the Swiss Ceneri Base Tunnel



Emergency and safety lights in the Ceneri Base Tunnel

Photo: BöSha Technische Produkte GmbH & Co. KG

Competence in emergency and safety luminaires with high demands on durability and quality was sought for the development of special lighting systems for the Ceneri Base Tunnel in the canton of Ticino.

At BöSha Technische Produkte GmbH & Co. KG these criteria were fulfilled. The 15.4-kilometer-long, third-

largest tunnel construction project in Switzerland consists of two single-track tubes, which are about 40

metres apart and which are connected to each other by a total of 46 cross-galleries. BöSha developed special

LED cross-gallery luminaires for Cabelx AG, a wholly owned subsidiary of Swisscom. 550 of them were installed and in future they will illuminate not only the galleries but also the technical rooms in the Ceneri Base Tunnel.

### Special requirements in the tunnel

In addition to a high efficiency, special requirements are imposed on the luminaires for use in tunnels: A uniformity of G1: 1:40, a luminaire mounting height of 250 centimetres and illuminance levels of 50 lux on average at banquets were required.

The LED cross-gallery luminaires are equipped with through-wiring via plug connectors with IP 69 screw connection, an impact-resistant Class IK 10 housing with high IP protection and special vibration-inhibiting luminaire brackets. The required shock and vibration test has been carried out in accordance with EN 60068-2 with a five-fold tolerance at frequencies of 1 to 5 Hertz. The frequency was 1 to 5 Hertz. The first oscillation reached an amplitude of 1 kilonewton per square metre, caused by a pressure shock, the further oscillations reached amplitudes of 0.1 to 0.2 kilonewton per square metre. The

cycle was completed with an amplitude of 0.4 kilonewtons per square metre, that started at negative value, caused by the suction effect. A pressure cycle test with 200,000 cycles was also carried out.

### High standards and easy maintenance

With a service life of 50,000 hours in the temperature range from -25 to +50 degrees Celsius, the requirements of other general tunnel safety lighting standards have been doubled. In accordance with the specifications, a central closing mechanism with a patented double-sided locking system allows the LED cross-gallery luminaire to be opened without tools, thus facilitating maintenance work.

BöSha prismatic escape route luminaires were also installed at 96 points in the Ceneri base tunnel. These luminaires have also withstood the pressure and suction load of 200,000 cycles. Each of them is furthermore redundantly equipped with two lighting circuits. Developed according to the latest LED technology, the luminaires have a high savings potential compared to those with conventional technology.

BöSha | Exhibitor InnoTrans 2020

## Brenner Base Tunnel: Construction progress on schedule

The largest infrastructure project in Europe and at the same time the world's longest underground rail link is on schedule: 115 kilometres, or 50 percent of the gigantic project, have been excavated. Around 1900 employees in Austria and Italy are working on the construction progress of the Brenner Base Tunnel.

So far, around 115 kilometres of tunnel have been excavated, including 34 kilometres of railway tunnel, 43 kilometres of exploratory tunnel and 38 kilometres of other tunnel structures such as emergency stations, logistics and access tunnels. At the four construction lots Tulfes-Pfons, Pfons-Brenner, Mauis and Eisack underpass, the weekly advance rate averages around 500 metres – both mechanically and conventionally. Three tunnel boring machines are capable of driving eleven tunnels simultaneously. The number of drives will soon increase even further with the start of the work on the Siltschlucht gorge section near Innsbruck.

The Brenner Base Tunnel will connect North and South Europe as the heart of the longest core network corridor that the EU has defined with the Trans-European Transport Network (TEN). Between 40 and 50 percent of this construction project of the century will be co-financed by the EU, since the most important measure is to counteract the constantly increasing traffic volume over the Brenner Pass. Last year, 2.4 million lorries

crossed the Alps there, more than the four Swiss and the two French Alpine passes combined recorded in the same period.

### Contribution to climate protection

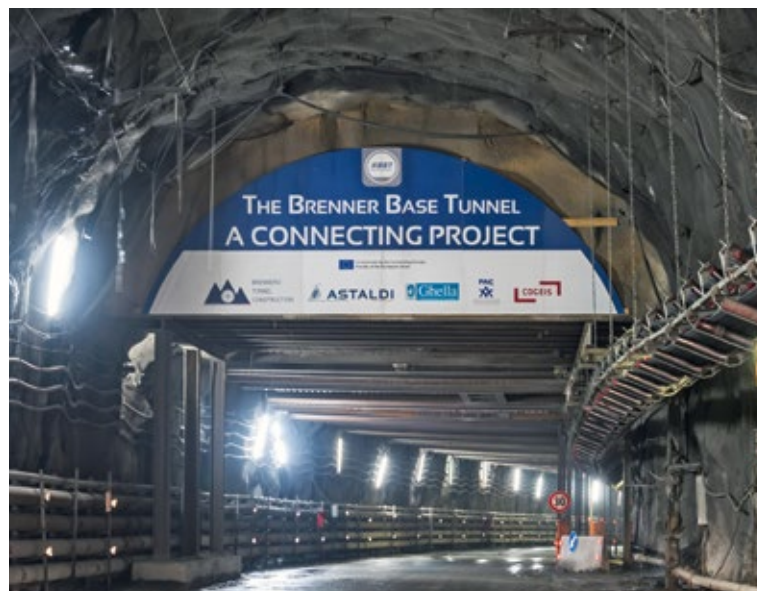
The Brenner base tunnel is scheduled to go into operation in 2028 and

will herald a new era of mobility in the Brenner corridor with a significant reduction in travel time of almost 70 percent. In addition, the tunnel is considered to be one of the most important environmental protection projects in Europe, since climate targets cannot be achieved without shifting traffic to rail: One tonne of goods transported by rail generates 21 times

less CO<sub>2</sub> than transported by road. The construction of the Brenner base tunnel will pay for itself in terms of the emissions it generates after around 18 years of operation – with a project life of around 200 years. The construction is also accompanied by numerous ecological compensation measures.

### Special feature: the exploratory tunnel

A special feature of the Brenner base tunnel is its third tunnel tube, the so-called exploratory tunnel. This is primarily used for geological preliminary exploration in order to make driving smoother. Half of the work is carried out by blasting and half by tunnel boring machines. The exploratory tunnel saves time and money: as a service and logistics tunnel during the construction phase and as a maintenance and drainage tunnel during operation.



Tunnel construction site in Mauis (Italy)

Photo: BBT SE

## NEWS

### ■ Semmering Base Tunnel behind schedule

Austrian Federal Railways ÖBB have announced that the completion of the Semmering Base Tunnel between Lower Austria and Styria will be delayed by one year. This means that the tunnel can only be opened for traffic as late as 2027. This delay is due to unforeseen geological difficulties which have led to a massive water penetration in the Lower Austrian section and subsequent flooding of the construction site. Furthermore, settlements on the surface above the tunnel have been discovered. The stabilisation of this problematic area requires more time than initially expected. At present, work is being carried out on the tunnel at 14 locations. According to ÖBB, 45 percent of the tunnel system has already been built successfully and without major incidents. In Styria, all construction lots are on schedule. After completion of the Euro 3.3 billion project, the travel time between Vienna and Graz will be cut by 30 minutes.



Tunnelling at the intermediate heading at Grautschenhof

Foto: ÖBB/Ebner

## Tailor-made for the urban space



The TSB should become the future of urban mobility.

Graphic: Max Bögl Group of Companies

The Transport System Bögl (TSB) travels at speeds of up to 150 kilometres per hour, is extremely quiet, independent of weather conditions and more economical than conventional rail-bound transport systems. It thus solves numerous challenges in urban public transport. The system will be presented at InnoTrans 2020.

As the developer and manufacturer of the track system, the construction company Max Bögl has already been involved in earlier maglev rail projects. On the basis of this experience, the company has developed its own Transport System Bögl (TSB) for local transport. After more than 125,000 journeys and 83,000 kilometres on the

specially built test track near Nuremberg, it will be presented to the trade public at InnoTrans.

### The future of local transport?

It offers efficient and emission-free passenger transport in urban conurbations on routes of less than 3 to over

50 kilometres. At up to 150 kilometres per hour, the TSB is twice as fast as trams and 50 percent faster than underground trains. The particular advantage for urban areas is that the rides can be flexibly adapted to traffic demands with very short headways, if necessary. The up to six-vehicle sections offer space for up to 762 passen-

gers and are not only independent of weather conditions, but also extremely quiet due to the running gear enclosed by the track. The TSB thereby requires comparatively little urban space. It tilts comfortably into curves at up to eight degrees and can cope with gradients of up to ten percent. It can therefore be well integrated into the urban land-

scape and can be built at ground level, on stilts or in tunnels.

### Cost-effective and low-maintenance

Max Bögl calculates with a price of 30 to 50 million Euro per kilometre with a double-track elevated guideway. This is about one sixth of the cost of an underground railway line. In addition, the construction time is comparatively short because the track is made up of industrially manufactured segments. An important advantage are the low operating costs, as the railway is wear-free and fully automatic.

The first customer is already convinced: The Chinese company Chengdu Xinzhu Road & Bridge Machinery Co. Ltd. is currently building a demonstration line in Chengdu and will market the TSB in China – a country with many rapidly growing mega-cities and a high demand for innovative transport solutions.

### All-round carefree package

Max Bögl offers the system consisting of vehicle, track and control technology as a package and is responsible for both planning and implementation. The company, founded in 1929, has decades of experience in railway line construction.

Max Bögl | Hall 4.2 | 120

## Cooperation: ZF in the 'advanced TrainLab'

ZF Friedrichshafen AG is cooperating with Deutsche Bahn AG in testing new technologies in the rail sector in the 'advanced TrainLab' – a test vehicle of Deutsche Bahn AG based on an ICE-TD train, which is currently being used for testing purposes on the tracks of the Federal Republic of Germany.

Connect@rail is an advanced system for condition monitoring, which allows comprehensive status recognition of components of the test train. Furthermore, connect@rail enables the rail infrastructure to be checked for potential dangerous points. In this way, safety and efficiency in rail traffic can be increased. In Germany alone, 18.4 million people commute to work every day – that is 59.4 percent of all employees. And the trend is rising.

The car is still the first choice for employees. But traffic jams, the lack of parking space and increasing emissions require a rethink. If rail transport is to play a greater role in the mobility mix of the society, trains must be able to withstand peaks in capacity utilisation and higher frequencies, and operate more efficiently. It is also important to avoid downtimes. Deutsche Bahn is therefore researching the use of new, innovative technologies with the 'advanced TrainLab' – a rolling test



The ZF sensors are located on the bogie of the test train.

Photo: ZF Friedrichshafen AG

laboratory based on a class 605 (ICE-TD) multiple unit train – in order to achieve these goals. ZF cooperates with DB AG and has installed its connect@

rail system in the diesel-electric train set. For use in the 'advanced TrainLab', ZF is installing wireless acceleration sensors on the unsprung parts of the

train's bogie, which can also record the temperature behaviour, the vibrations and oscillations as well as the inclination of the train. The wheel-rail contact can also be monitored. In this way, connect@rail enables not only the monitoring of the vehicle, but also of the track condition.

### Everything at a glance

The measurement and route data are transmitted to the ZF IoT Cloud and can be read out via computer or mobile device for evaluation and visualisation. The operator thus receives real-time analyses that help him to recognise the condition of the vehicle and the infrastructure and to plan maintenance cycles based on their condition. This ensures a smooth and cost-optimised operation of the entire fleet. Passengers benefit from more efficient rail transport and increased vehicle availability. The DB AG test train offers a unique opportunity to test the advanced condition monitoring system under real conditions, commented Dr. Klaus Geißdörfer, head of ZF's Industrial Technology Division, on the cooperation. Under the motto Mobility-Life-Balance, ZF is working towards the goal of clean and safe mobility across all business units.

ZF Friedrichshafen | Hall 20 | 580  
Deutsche Bahn | Hall B CityCube | 410

## NEWS

### New temperature sensors TE2 and TCR6

The two temperature sensors TE2 and TCR6 are the two new ones in the railway portfolio of the Swiss Baumer Group. Both measure the temperature in power electronics, in diesel engines or in cooling systems of locomotives and trains with an accuracy of +/-0.1 Kelvin. For both sensors, there is also a measuring tip for accelerated response times; TE2, delivers the correct temperature value after only 1.3 seconds. They are tested according to the important standard EN 50155, which regulates the properties of electronic equipment on rail vehicles, making sure that the sensors reliably withstand shocks, vibration, dirt and moisture and that they robustly resist against electromagnetic interference. Furthermore, the railway industry increasingly requires a clear identification of each individual component in a vehicle. For this reason, each Baumer sensor for railway applications has a designation according to the GS1 standard (GIAI serial number and GTIN). It therefore becomes possible to trace back each individual sensor over its entire life cycle in order to know when and how it was manufactured.

Baumer | Hall 27 | 130

# Power electronics from Medcom for the Impuls

The new Impuls 36Weh from the Polish vehicle manufacturer Newag SA is a three-car articulated trainset that can be driven both electrically – with pantograph under catenary – and with diesel.

■ This means that the diesel-electric hybrid can also run on sections of line without overhead lines. The multiple unit has a capacity of approx. 330 passengers and is designed for a speed of up to 160 kilometres per hour. Poland's first hybrid train has been equipped with traction inverters, auxiliary converters, battery chargers, a train control and monitoring system (TCMS) and low-voltage distributors from Medcom Sp. z o.o. in Warsaw, Poland.

## Future-proof system

The modern drive system consists of two traction housings to control the operation of the asynchronous traction motors, each with a power output of 400 kilowatts, and for generating the voltage to supply the vehicle's on-board systems. Each housing contains the FT-800-3000 traction inverter, the PSM-82 auxiliary converter and a Medcom converter cooling system.

Medcom has thus developed a modern traction system that achieves high performance and reliability parameters. The braking energy can be recuperated into the overhead line, thus saving energy. Together with the developed vehicle control system, the overall solution contributes to a lower energy consumption and ultimately to lower vehicle operating costs.

Medcom has the technology to offer completely emission-free and envi-

ronmentally friendly public transport vehicles in Poland, said Piotr Wroński, Member of the Board of Directors at Medcom. The new Impuls is also the first major step towards the creation of an electric-hydrogen hybrid train.

Thanks to the hydrogen fuel cell propulsion system, trolleybuses in Riga can already cover a distance of up to 100 kilometres without a power supply network; a similar solution is also used in the Solaris Urbino 12 hydrogen bus.

Medcom | Hall 17 | 255



The power electronics in the Impuls 36Weh are from Medcom.

Photo: Medcom Sp. z o.o.

# Future-proof power supply

The construction of new lines as well as the electrification and modernisation of existing lines will lead to more complex protection and control systems for the energy supply.



The RER670 Intelligent Electronic Device as a building block for digitalisation  
Photo: ABB

■ Digitalisation is the future, so there must be a device that bridges the gap between traditional and digital substations: ABB's RER670 Intelligent Electronic Device (IED) from the Relion® family of protection and control products. Designed to protect and control two-phase railway applications at 16.7 and 50 or 60 Hertz, the IED protects transmission lines or power transformers in isolated, compensated and

high impedance earthed network solutions. To ensure interoperable, reliable and future-proof solutions, the products meet the requirements of the IEC 61850 standard.

## Flexible application

Relion® protection and control products offer future-proof application and support different substation topologies, providing functional inte-

gration and multi-object protection. At the same time, the device supports traditional station topologies.

Functions such as precision time protocol (PTP), process bus and station bus can be easily used with today's installations and can be combined and tuned within the same IED. With IEDs as a gateway to a wide range of process data, substation automation becomes future-proof.

ABB | Hall 9 | 615

## NEWS

### ■ Proven technology for the Gotthard Base Tunnel

Components from Lütze Transportation GmbH are installed on board the currently most modern rail maintenance vehicles used in the Gotthard Base Tunnel. The 31 vehicles were delivered to Swiss Federal Railways (SBB) by HARSCO Rail Europe GmbH from Düsseldorf, part of the globally active HARSCO Rail with headquarters in the USA. Various proven Lütze components are in use on board, including analogue-to-analogue converters, analogue limit switches, various positively driven relay modules, diode modules and a USB charging system. This consists of a DC/DC converter and the corresponding USB charging sockets and is certified in accordance with EN 50155. This means that mobile phones and tablet PCs can be charged conveniently and safely in the driver's cab of the maintenance vehicles, and operational plans and timetables can be updated in real time. An analogue-to-analogue converter and an analogue limit switch were combined to monitor the current of 230-Volt alternating current power consumers. The components from Lütze Transportation GmbH are characterised in particular by their compactness and modularity and their wiring advantages. The maintenance vehicles are equipped with an advanced control technology and automatic train couplers. All train formation work and brake tests can be carried out from the manned driver's cab. No employee has to work outside on the vehicles or between them, thus increasing work safety.

Lütze Transportation | Hall 27 | 630



On the move in the Gotthard base tunnel with Lütze technology

Photo: Lütze Transportation GmbH

**Eurailpress Career Boost**  
A dream job in 90 seconds at InnoTrans

**InnoTrans Campus**  
Your Future.

*InnoTrans and Eurailpress present a new application platform.*

At the beginning of November 2019, the German Federal Government increased the funds for local public transport by rail by a total of 5.2 billion euros by 2031.

■ These funds are needed to expand digitisation in the course of the change in mobility. In order to successfully achieve this change, the industry is dependent on thousands of well-trained specialists. The current shortage of skilled workers in the transport sector is not only a German problem. In other EU countries, too, there is an acute shortage of engineers, IT experts, train drivers, controllers or mechanics. To-

gether with Eurailpress, InnoTrans intends to address this problem of the sector and is presenting the Eurailpress Career Boost for the first time at InnoTrans 2020 on the Talent Stage in the RecruitingLAB. The new recruiting concept offers five applicants from each of five categories (technical professions, engineers, IT experts, industrial and commercial professions) the opportunity to introduce themselves

to potential future employers in 90 seconds.

After the pitch presentation, they are given the opportunity to ask the applicant three questions. Manuel Bosch, publishing director of dvvmedia's Traffic and Technology division, was convinced of the new concept from the outset: "The Eurailpress Career Boost turns the game around: Companies do not present their job offers, but young talents present themselves to companies. This is how we make the next generation visible to the railway industry!" This is also confirmed by the Director of InnoTrans, Kerstin Schulz: "For the first time the

innovative Eurailpress Career Boost will give applicants the chance to become the centre of the event by proactively presenting themselves to the industry. This way of attracting the attention of recruiters from the mobility sector has never been provided before. Applicants can seize this opportunity to stand out persuasively at the InnoTrans Campus."

**Application start from March 2020**

Starting next month, it will be possible to apply for participation in the Eurailpress Career Boost via a contact form at [www.eurailpress.de/careerboost](http://www.eurailpress.de/careerboost). Once the application deadline will have expired, the applications will be reviewed by an internal Eurailpress jury and five applicants per professional category will be selected. The 25 selected candidates will receive a confirmation and an invitation to InnoTrans in Berlin by the end of August, where free admission to InnoTrans on Wednesday 23 September and a performance on the Talent Stage will be awaiting them. Company talent scouts in search of suitable young professionals at the Eurailpress Career Boost do not have to register separately. They will be able to make direct contact with the candidates on 23 September at the Recruiting LAB at the InnoTrans Campus in Hall 21e.

## Online Ticket Shop – easy and inexpensive

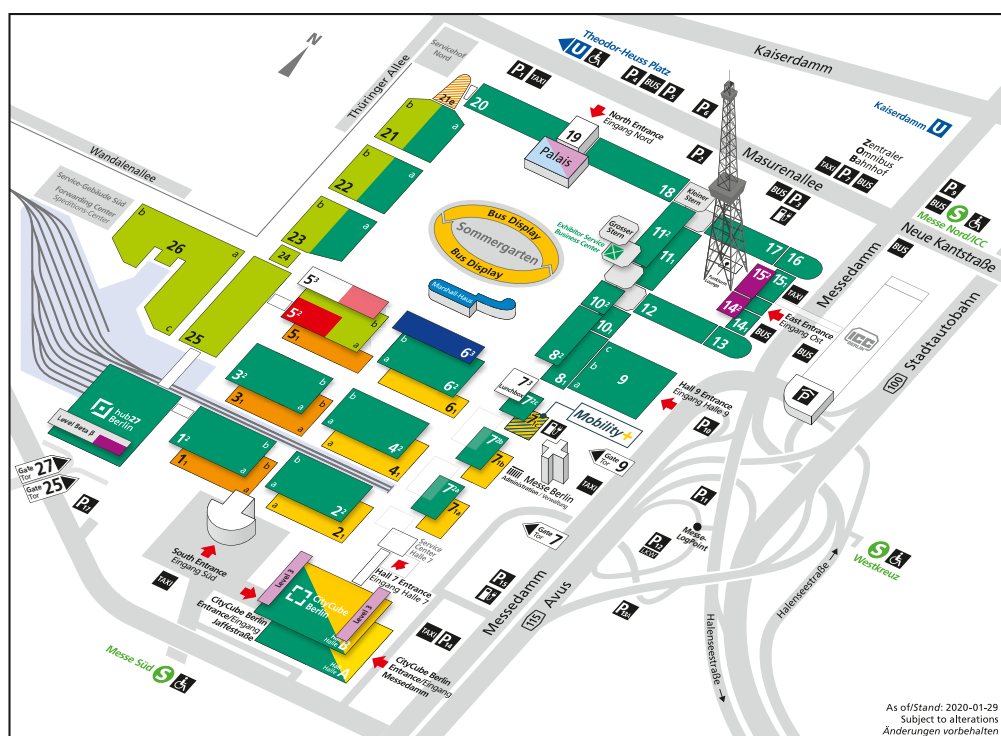
■ The ticket shop for day/permanent tickets and student tickets will be open as of March 2020 under [www.innotrans.com/ticketshop](http://www.innotrans.com/ticketshop). Trade

visitors save time and money with their online ticket, and have the right to free use of Public Transport in Berlin (ABC) during its validity.

Trade visitor pass	Online	On-site
Day ticket	50 Euro	95 Euro
Permanent ticket	75 Euro	130 Euro
Day ticket for students	13 Euro	13 Euro



The on-site registration for trade visitors without online ticket will only be possible at the Hall 9 entrance and the East entrance.



## Exhibition grounds InnoTrans 2020



- Railway Technology
- Interiors incl. Travel Catering & Comfort Services
- Railway Infrastructure
- Tunnel Construction
- Public Transport
- incl. Mobility+
- Outdoor Display
- Bus Display
- Opening Ceremony
- InnoTrans Convention
- Speakers' Corner
- InnoTrans Campus
- Business Lounge (Marshall-Haus)
- Press Centre
- Restaurant "Meet'n'Eat"

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