

In front of the "Railbot" in the Hitachi Rail showroom in Ditzingen, near Stuttgart: In his role as Vice President Markets Germany & Global Account Manager Deutsche Bahn at Hitachi, Markus Fritz is driving forward the modernization of rail transport in Germany. ©Porsche Consulting/Jörg Eberl

Digital rail: Hitachi chooses Germany as a role model

08/10/2025 In mid-2024, Hitachi Rail took over the Ground Transportation Systems (GTS) business unit from the Thales Group. Value: 1.66 billion euros. With the acquisition of the specialist for railroad signaling systems, the Japanese company has positioned itself at the forefront of the global mobility sector as a full-range supplier. The strategy: The most difficult market has priority.

There is a long-running tradition of criticizing the German rail system. Whether in passenger or freight transport – the aim everywhere is more reliability and more customer orientation. Now the Japanese Hitachi Group has chosen Germany as a model for the ultra-modern rail transportation of the future. And Hitachi is ready to play a key role in achieving this challenging goal.

In Germany of all places. Why? "Germany's rail system is highly complex. As a European transit zone, it has long since reached the limits of its capacity. It has also been neglected for many decades, and not

just in terms of technology," says Markus Fritz, Vice President Markets Germany & Global Account Manager Deutsche Bahn at Hitachi. For the internationally experienced graduate engineer and trained power electronics technician, this is the special attraction: "If we manage to give Germany modern rail transport, then other nations will follow suit."

"If" is the key word here. And Markus Fritz also has to live with that. He is also a member of the Executive Committee of the German Railway Industry Association. And there's something he recognized long ago: Instead of unrealistic and unaffordable total modernization in one block and at high speed, there is now the need for smaller, affordable steps in the right direction. Meaning: consistent, continuous preparation for the technology of the future, target-oriented decisions, and a fair amount of patience.

Progress requires patience

It doesn't look like a quick deal. This is also clear to Hitachi's headquarters in Tokyo, where Germany has been identified as "the world's largest accessible rail market". The calculation focuses on the long term and a full range of products: Hitachi Rail currently supplies control and safety technology. But the Group also has high-performance trains in its portfolio. For example, the ETR 1000 – running at speeds up to 220 miles per hour and designed for cross-border traffic. It is already on the rails in Italy, France, and Spain. In Germany, on the other hand, Hitachi Rail is exercising patience and helping to build the railroad system with the aim of one day being able to supply customers, such as Deutsche Bahn, with technological infrastructure and rail vehicles from a single source.

Trials are already underway to show what could become reality in the future. Together with DB Cargo and partners such as Knorr-Bremse, Hitachi Rail is putting Europe's first automated freight locomotive on the rails. The Dutch Betuweroute, a 100-mile-long separate freight line built for seaport hinterland traffic and completed in 2007, serves as a test route. The Betuweroute connects the important international port of Rotterdam with the German-Dutch border town of Zevenaar – as a connection to the inner-European transport network. The corridor relieves the burden on road freight transport via highly frequented highways.

For the current pilot project, a DB Cargo locomotive was equipped with state-of-the-art ATO (Automatic Train Operation) and RTO (Remote Train Operation) technology for the first time. The aim is to test automated driving functions under real conditions and create the basis for a production-ready, marketable product in automated freight transport. Put simply: Autonomous locomotives will no longer need human drivers. This is considered a milestone on the way to automated, networked and more efficient freight transport in Europe. As a technology partner, Hitachi Rail supplies the ATO onboard system and is responsible for system integration. Markus Fritz: "This once again underlines our role as a pioneer for digital innovations in the rail sector." With this, Hitachi Rail wants to support one of Europe's most important transport policy goals: More freight on the railways.

But back to the status quo: The example of a Deutsche Bahn flagship line shows what the path to a fully

digitalized railroad will look like in small steps in reality. It is the metropolitan link between the world port of Hamburg and the capital, Berlin. A main line between important junctions in the rail network. Since the opening of the popular, approximately 170-mile high-speed line in 2004, passengers can, given optimal conditions, reach their destination in around only 100 minutes. But even a newly built high-speed line gets old quickly. Especially when long-distance traffic, regional trains, and freight transport have to share the same rail line day and night, exposing the route to a high permanent load. Currently, this means: General refurbishment! And to achieve this, the important, highly frequented traffic axis will be completely closed. Nine months, from August 2025 to the end of April 2026. Meaning: Time-consuming detours of long-distance trains, inconvenient bus replacement services in regional service.

Of course, the full closure allows unhindered and therefore faster construction. The route could also be fully equipped with the latest technology. Could being the operative word here. The most important module would be the European Train Control System (ETCS). ETCS is a digital signaling technology that replaces conventional track signals. For example, it transmits signals and speed limits directly to the driver's cab so that the train driver can drive more precisely. Thanks to real-time communication between trains and infrastructure, ETCS improves safety, increases reliability and boosts the capacity of the existing rail network.

But even between Hamburg and Berlin, this progress will have to wait a few more years before it becomes usable. The background: In another major project, the Riedbahn, Deutsche Bahn recently experienced how complex and time-consuming the installation and acceptance of ETCS technology is as a dual system with conventional safety systems. Therefore, during the general renovation of the Hamburg-Berlin line, Deutsche Bahn will "only" prepare the interlockings and the safety-relevant axle counting technology (sensors that report whether a track section is free) for the future use of ETCS. That means: The conventional train control systems PTC (Positive Train Control) and LTC (Line-based Train Control) will remain in operation for the time being. The ETCS technology will not be installed until the early 2030s.

About Markus Fritz

Strategy of small steps

After all, the strategy of smaller steps is the technological way forward. At a slower pace, but with the right preparations. By the time all the conditions are in place in the 2030s, Deutsche Bahn and other railroad companies will be able to better plan their orders and configurations of new trains. ETCS-capable vehicles will then be required. If the switch to ETCS were made today, many of the existing vehicles would have to be fitted with cost-intensive double equipment – with ETCS in addition to the conventional safety and control systems.

Railroad companies operating in Germany have to pay for the digital upgrade of their fleets themselves.

The state finances the infrastructure, meaning the technology along the tracks. However, with increasing digitalization, costs are shifting more and more to the vehicles. But as a transit country, it is not just about German fleets. The routes must be ETCS-capable because, for example, trains traveling through from France or the Czech Republic are already designed for modern technology. And the Italian state-owned company Trenitalia wants to run the sleek red Hitachi flagship ETR 1000 to Munich as early as 2026 and to Berlin from 2027.

This complex scenario is the perfect use case for Hitachi Rail: The company is currently primarily supporting the transformation towards digital signaling technology. But this is only the first step. Hitachi Rail can and wants to supply complete systems from the large corporation's portfolio, including power supply for rail electrification and ultra-modern trains. A full range! One of the first important preparatory steps is the Hamburg-Berlin project: The network operator, the railroad subsidiary DB InfraGO AG, has concluded a contract with Hitachi Rail. This includes the modernization of the control and safety technology (CST) on a 200-kilometer section between the towns of Paulinenaue and Schwanheide. Sub-centers of large interlocking areas are being renewed and interlocking technology modernized. The route will then allow maximum speeds of up to 230 kilometers per hour. The project is part of the "Digital Rail Germany" program. It aims to improve the safety, efficiency, and sustainability of rail transport and contribute to achieving the objectives of the Trans-European Transport Network (TEN-T).

TEN-T is financed by the European Union and its Member States. The aim is to develop an interconnected network of roads, railroads, inland waterways, seaports, airports, and train stations within the European Union. The aims are to strengthen the internal market, promote economic growth, and improve networking between the regions.

From the cycle time to the connection conflict

With a view to the huge German rail network, which is around 20,000 miles long, the central question for Markus Fritz is: "How do I achieve maximum capacity on the existing infrastructure?" The expert knows: "No more tracks are being built. We need higher and reliable cycle times on the existing infrastructure." In other words, the number of departures per hour must increase. And the timetable should be kept as smooth as possible. "We can achieve this with ETCS, digital interlockings, and an integrated control and operating system as an interface between people and machines," says Markus Fritz. In addition, timetables could be significantly optimized through the use of artificial intelligence. This also includes the so-called "connection conflicts" – an ongoing issue: Due to delays or disruptions, transfer passengers are unable to catch the next train. Here, too, Markus Fritz sees passenger-friendly solutions with the help of artificial intelligence.

With all the patience and understanding for complexity and complications: Markus Fritz does not want to wait any longer than absolutely necessary for the train to the future. Hitachi Rail's commitment should have a noticeable effect and the full range will soon be visible in the focus market of Germany. "We are working to ensure that Hitachi vehicles will be used by German rail operators tomorrow, of

course. And tomorrow will hopefully be sooner than we can all imagine," says Markus Fritz.

Info

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Image Sublines

Path: Digital rail: Hitachi chooses Germany as a role model/Images/img_1.jpg
Title: Markus Fritz, Vice President Markets Germany & Global Account Manager Deutsche Bahn at Hitachi, 2025, Porsche Consulting GmbH
Subline: "If we manage to give Germany modern rail transport, then other nations will follow suit," says Markus Fritz, Vice President Markets Germany & Global Account Manager Deutsche Bahn at Hitachi. © Porsche Consulting/Jörg Eberl

Path: Digital rail: Hitachi chooses Germany as a role model/Images/img_2.jpg
Title: Markus Fritz, Vice President Markets Germany & Global Account Manager Deutsche Bahn at Hitachi, 2025, Porsche Consulting GmbH
Subline: Markus Fritz at the helm of the "Railbot" simulator. Things could look different in the future: With the modern ATO and RTO technology, trains can operate completely autonomously and no longer require a driver. © Porsche Consulting/Jörg Eberl

Path: Digital rail: Hitachi chooses Germany as a role model/Images/img_3.jpg
Title: Markus Fritz, Vice President Markets Germany & Global Account Manager Deutsche Bahn at Hitachi, 2025, Porsche Consulting GmbH
Subline: Markus Fritz presents a model of an axle counter in the Hitachi Rail showroom. It is highly significant for safety: The technology uses the attached sensors to report whether a section of track is clear. © Porsche Consulting/Jörg Eberl

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Title: Markus Fritz, Vice President Markets Germany & Global Account Manager Deutsche Bahn at Hitachi, 2025, Porsche Consulting GmbH
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Path: Digital rail: Hitachi chooses Germany as a role model/Images/img_5.jpg
Title: Hitachi Rail ETR 1000, 2025, Porsche Consulting GmbH
Subline: In addition to control and safety technology, the Hitachi Rail portfolio includes high-performance trains such as the ETR 1000. It is already in use in Italy, France and Spain. The Italian company Trenitalia plans to run the ETR 1000 to Munich in 2026 and to Berlin from 2027. © Hitachi Rail, Trenitalia

Path: Digital rail: Hitachi chooses Germany as a role model/Images/img_6.jpg
Title: Markus Fritz, Vice President Markets Germany & Global Account Manager Deutsche Bahn at Hitachi, 2025, Porsche Consulting GmbH
Subline: How can the capacity of the rail network be maximized? “We can achieve this with ETCS, digital interlockings, and an integrated control and operating system as an interface between people and machines,” says Markus Fritz. © Porsche Consulting/Jörg Eberl

Path: Digital rail: Hitachi chooses Germany as a role model/Images/img_7.jpg
Title: Markus Fritz, Vice President Markets Germany & Global Account Manager Deutsche Bahn at Hitachi, 2025, Porsche Consulting GmbH
Subline: Markus Fritz has a clear vision: In the future, Hitachi Rail vehicles will also be used by German rail operators – and Hitachi Rail will be perceived as a full-service provider in the focus market of Germany. © Porsche Consulting/Jörg Eberl

Path: Digital rail: Hitachi chooses Germany as a role model/Images/img_8.jpg
Title: Simon Braun, Partner at Porsche Consulting, Markus Fritz, Vice President Markets Germany & Global Account Manager Deutsche Bahn at Hitachi (l-r), 2025, Porsche Consulting GmbH
Subline: Markus Fritz in conversation with Simon Braun, Partner at Porsche Consulting. To secure the future of rail in Germany, the right competencies, responsiveness, a high degree of standardization, and the efficient use of digital solutions are required. © Porsche Consulting/Jörg Eberl

Path: Digital rail: Hitachi chooses Germany as a role model/Images/img_9.jpg
Title: Simon Braun, partner at Porsche Consulting, 2025, Porsche Consulting GmbH
Subline: Simon Braun, Partner at the Porsche Consulting management consultancy. © Porsche Consulting/Jörg Eberl

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