



ON TIME,
EVERY TIME
COUNTS ON
CONNECTIVITY

THAT'S WHY THE WORLD'S RAILWAYS
COUNT ON TE CONNECTIVITY

RAIL

EVERY CONNECTION COUNTS



INDUSTRIAL

CONNECTING POWER AND DATA TO AND THROUGH THE TRAIN

Urbanization. Growing populations. Increasing environmental concerns. The railway industry is rapidly changing to match global demands for greener, more intelligent transportation. Railway systems must be engineered for efficiency and sustainability while delivering:

- Greater innovation and reliability
- Reduced cost and delivery lead times
- Higher performance and product standardization

TE Connectivity can help you meet these demands by efficiently connecting power and data to and through the train—anywhere in the world.



DEDICATED INDUSTRIAL ENGINEERING & MANUFACTURING SITES

- Bangalore, India
- Bideford, UK
- Bydgoszcz, Poland
- Christchurch, New Zealand
- Grenoble, France
- Hermosillo, Mexico
- Landisville, USA
- LeMans, France
- Menlo Park, USA
- Providence, USA
- Rödermark, Germany
- Swindon, UK
- Trutnov, Czech Republic

PRODUCT INFORMATION CENTERS

- Austria
- Belgium
- China
- Czech Republic
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary
- India
- Ireland
- Italy
- Latvia
- Lithuania
- Luxembourg
- Netherlands
- Norway
- Poland
- Portugal
- Slovakia
- Slovenia
- Spain
- Sweden
- Switzerland
- United Kingdom
- United States

TE RAIL: A PARTNER YOU CAN COUNT ON

TE Rail is part of the TE Industrial business of TE Connectivity. As a global company, we're uniquely suited to provide market-leading railway solutions. Our history of innovation spans decades. Our engineering expertise spans industries. And now that Deutsch has joined TE, we are well positioned to offer both rectangular *and* circular connectors. With an end-to-end technology portfolio backed by powerful insight into the day-to-day needs of rail, we understand how system-wide connectivity improves the way people and cargo are transported across countries and continents.

Yet what truly elevates TE Rail is our innovation partner: You. We work closely with customers to develop flexible connectivity solutions for high voltage, low voltage, infotainment and signaling applications. From design to delivery and through the life cycle. From Point A to Point B and beyond.

COUNT ON OUR SUPPORT HERE, THERE, EVERYWHERE

TE has manufacturing, operations and design centers around the world. With 30 global Product Information Centers (PICs) featuring dedicated technical experts who speak English and 12 other languages, there's always knowledgeable assistance within reach. Our local engineers speak your local language too and are ready to leverage their expertise for you. TE makes it easy to connect: Just call, email or chat. Our goal is to assist you as fast as possible.



TE CONNECTIVITY FAST FACTS

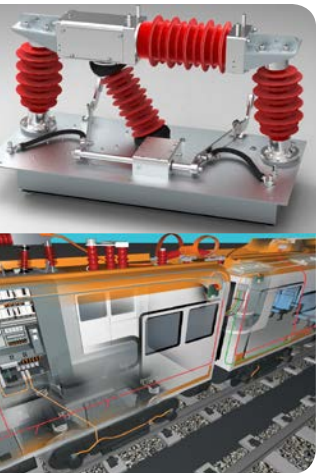
Annual Revenue:	US \$14+ billion (2011)
R&D Investment:	5% of sales per year (approx.)
Patents Issued/Pending:	20,000+
Employees:	100,000+
Engineers:	8,000+

HIGH-VOLTAGE APPLICATIONS: EFFICIENCY STARTS AT THE TOP

As emerging countries begin investing in optimized railroad infrastructure, and developed countries upgrade existing train networks, manufacturers look for efficiency savings in all areas of design. For high-voltage applications, that means everything from minimizing the top weight of the car to maximizing maintenance intervals to reducing aerodynamic noise. It also means partnering with a company that delivers solutions you can count on all across the globe.

TE Rail offers a comprehensive range of interconnection, insulation, protection and switching equipment built for 15kV and 25kV. Our complete high-voltage system comes pre-tested and ready for installation. Yet we never stop innovating: Our engineers are always working on the next high-tech solution—and bringing tomorrow's railway one step closer to today.

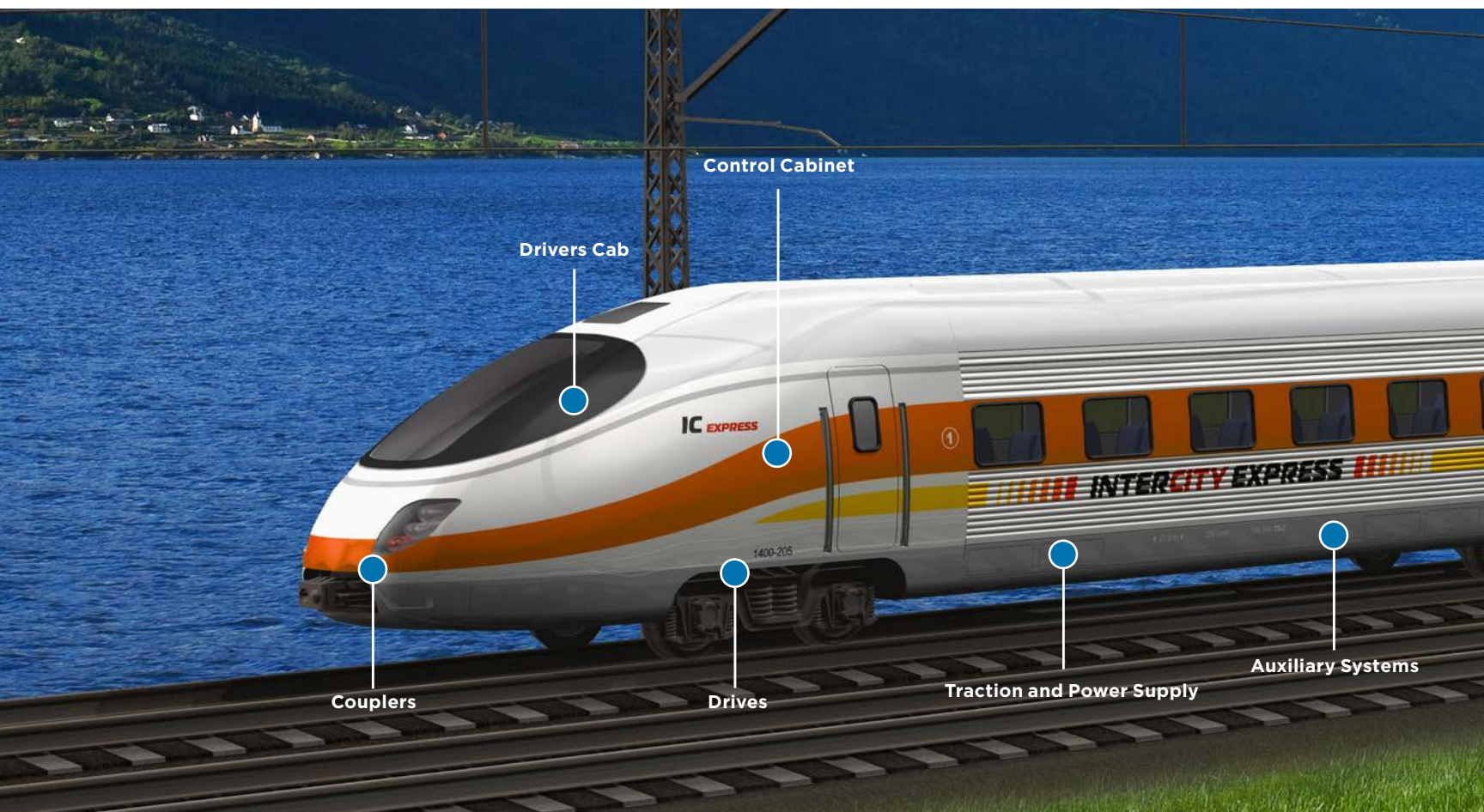
APPLICATIONS: • HIGH-SPEED TRAINS • METRO • LOCOMOTIVES



TE VESA: THE FUTURE IS ELECTRIC

The TE VESA roofline solution is the first completely electromagnetically operated system for high-voltage vehicles. The energy-efficient TE VESA system is performance-qualified on both high- and medium-speed trains and built to handle any climate. At the heart of this innovative system is the TE VESA Vacuum Circuit Breaker (VCB). Designed to replace inefficient pneumatic actuation systems, our VCB offers:

- Electromagnetic actuation to reduce energy consumption and maintenance costs
- Instant-on capabilities even in the harshest environment
- An industry standard footprint, making it suitable for new and retrofit builds



LOW-VOLTAGE APPLICATIONS: CONTROL AND POWER THROUGHOUT

Safely and efficiently stepping down from high to low voltage requires seamless connectivity between the control, power, monitoring and signaling systems throughout the train. With the addition of Deutsch, TE Rail now offers customers an unmatched range of low-voltage applications, including innovations for the propulsion system, intervehicle system and train control. We also provide unrivaled testing capabilities—from railway standards to electrical, mechanical and environmental tests—to ready every product for high-stress environments.

By delivering industry-leading optical performance with low-power consumption, our customized solutions are built to evolve with changing safety and security standards.

APPLICATIONS: • HIGH-SPEED TRAINS • LIGHT RAIL VEHICLES • SIGNALING SWITCHING EQUIPMENT
• METRO • LOCOMOTIVES

EKO SERIES: SAVE SPACE, TIME & WEIGHT

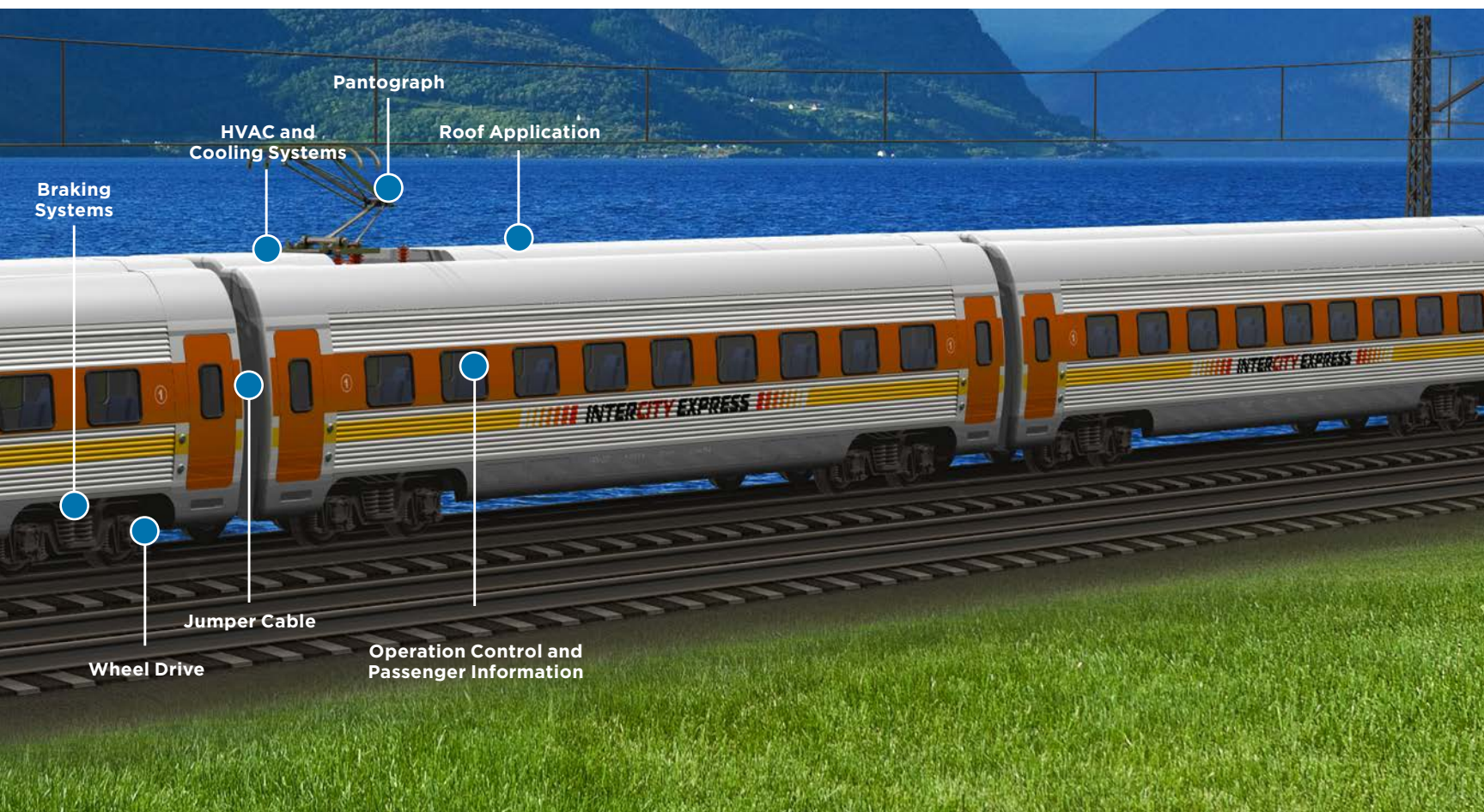
Integrated from the Deutsch portfolio, TE Rail's field-proven EKO family of connectors is equipped to handle all power applications of any train, whether static or dynamic. Built to save space, cut assembly time and reduce weight, the series features:

- **EKO:** Power Composite Connectors are unshielded, compact and light
- **EKO-S:** Power Shielded Connectors meet high mechanical constraints
- **EKO-D:** Power Derivation Connectors with multi-pole derivation to split the power signal
- **EKO-A:** Power Modular Connectors for dynamic applications, designed according to the rolling stock standard



DEUTSCH

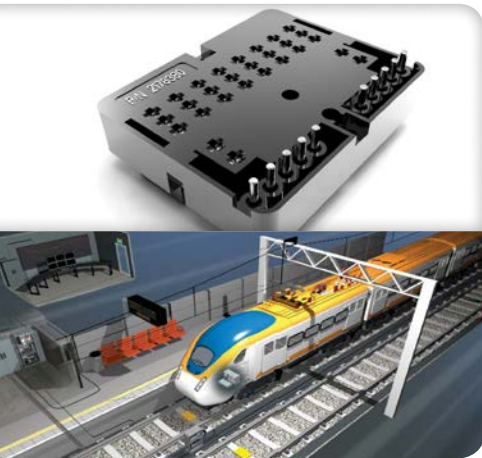
is now



SIGNALING: SMARTER DESIGN LEADS TO SAFER SYSTEMS

While the world's network of railways grows ever more complex, signal systems must grow ever more intelligent. They must be designed for modularity and plug-and-play installation. Built for safety and reliability—without increasing cost. As a global manufacturing company, TE Rail produces signaling solutions in a controlled environment, limiting risky track-side installation and maintenance. We're able to leverage expertise from industries like aerospace and military to develop cost-effective applications and provide a complete range of digital signaling solutions. Integrating not just connectivity but the whole system into a production area.

Operational efficiency and safety are the primary goals for every signal system. That's why we develop harsh connectivity solutions and fail-safe mechanisms between relays. Durable components that offer the highest level of anti-corrosion and vibration-, dust- and water-proof capabilities. Plus, Ethernet and fiber optic technologies that provide safer wireless communication from train to signal to train.



INFOTAINMENT: MOVING THE PASSENGER'S OFFICE ON BOARD

Passenger trains have become all about the passenger. The commuter who needs instant Internet connectivity to access their office. The traveler who wants more network bandwidth for streaming and downloading. The rider looking for real-time data feeds of the train's location. All of which demands WiFi or even WiMAX that never skips a beat. Yet these demands also create an opportunity: In-train communication systems provide a way to reach and market to passengers like never before, adding a new stream of revenue for rail operators.

TE Rail is uniquely equipped to help you meet these challenges with an extensive range of efficient, reliable connectivity solutions and broad engineering capabilities. We bring in deep expertise from fiber optics and high-speed data communications while leveraging design solutions from aerospace (in-flight entertainment) and automotive (intuitive touchscreen controls) to create a seamless communications experience for every passenger, every ride.

- APPLICATIONS:**
- HIGH-SPEED TRAINS
 - METRO
 - LIGHT RAIL VEHICLES
 - SIGNALING SWITCHING EQUIPMENT



SERVICE AND SUPPORT FOR THE ENTIRE LIFE CYCLE

Intelligent rail systems require service that keeps pace with innovation. TE Rail delivers with a support program centered on the product life cycle. Our maintenance solutions are designed to be predictive—not just reactive—offering reliable service when and where customers need it.

- **Simulation:** We are leading the simulation of railway product performance to predict how your system will behave—and address a problem before it becomes one
- **Testing:** Enhanced by the Deutsch acquisition, TE's in-house testing capabilities include railway standards, mechanical, electrical, environmental testing and ANSYS analysis for qualification and validation
- **Service:** TE provides industry-leading maintenance on top of and next to the train, track-side and at the train depot
- **Accountability:** If something goes wrong with your system, TE has the experts and specialists in place to take care of it
- **Commissioning:** Our team of engineers are ready to design and perform upgrades to meet the rail industry's ever-changing challenges
- **Training:** We provide exceptional product training for companies who want to keep maintenance personnel in-house



ON TIME, EVERY TIME COUNTS ON CONNECTIVITY

TE Rail works with you every step of the way to engineer innovative, efficient railway solutions and help solve your toughest connectivity challenges. From the high-voltage power line and throughout the entire train, we deliver the broadest product portfolio and systems expertise to connect power and data safely and reliably—anywhere in the world.

Let TE Connectivity help you meet the growing demands of rail. By talking to our experts early in the design cycle, you can achieve a sustainable competitive advantage. **To learn more, visit te.com/railway.**

TE CONNECTIVITY IS

- ISO-9001 CERTIFIED
- ISO-14001 CERTIFIED
- IRIS CERTIFIED

ISO
9001
QUALITY
ASSURANCE

IRIS
Certification



LET'S CONNECT

We make it easy to connect with our experts and are ready to provide all the support you need.

Just call your local support number or visit te.com/railway to chat with a Product Information Specialist.

TE Technical Support Center

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INDUSTRIAL