SERVING SAFETY

Mors Smitt Railway Technology

MORS SMITT

Mors Smitt
A Wabtec Company

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Mors Smitt **Railway Technology**

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Vision

Worldleader in railway relay technology and energy measuring systems

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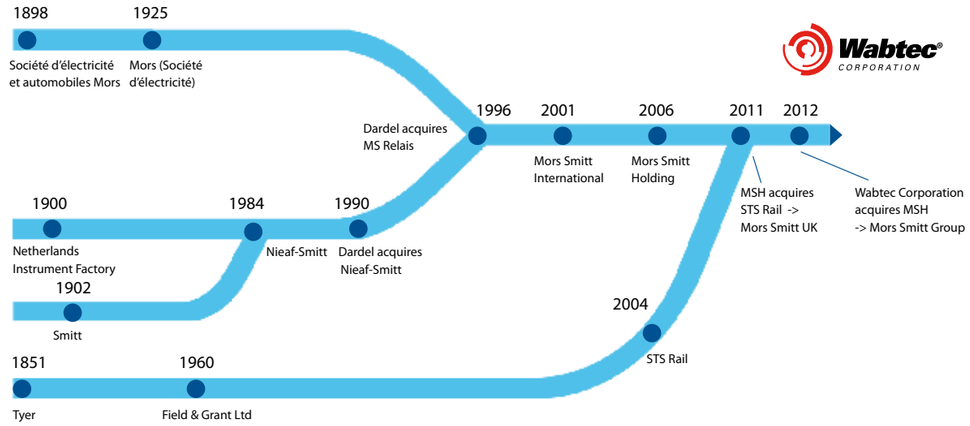
Mors Smitt

Mission

We highly value our customers and put service first. We are committed to quality excellence to create reliable products and services, serving the stringest reliability, availability, maintainability, safety, health and environmental demands from our customers. This commitment will result in lower life cycle cost.

History



Markets

Mors Smitt is serving both the railway rolling stock and signalling / infrastructure markets. The railway market demands compliance to the strictest standards. Today Mors Smitt has an installed base of 6 million relays in operation worldwide.

Global supplier

Mors Smitt is a trusted partner in your supply chain. Worldwide availability of company products is assured by a network of professional, trained and dedicated subsidiaries, distributors and agents offering local service and support.

Mors Smitt is a total supplier for onboard and trackside safety-critical solutions. Combining electro-mechanical ultra-high dependability relays with safety-critical electronics. All is manufactured to the strictest standards.

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Designers, manufacturers & suppliers of **ultra-high dependability** electro-mechanical components and solutions for the **railway industry**

Rolling stock

- World's widest relay range
- Protection components
  - Protection relays
  - Hall effect sensors
  - Minature circuit breakers
- Traction energy measuring solutions
- Integrated electrical solutions
- Speedometers and panel indicators
- Electronic door control units

Rolling stock and signalling / infrastructure - the two main sectors

Signalling / infrastructure

- Safety critical relays
- Signalling relays
- Protection components
- Retrofit & replacement solutions
- Maintenance & test equipment

Many of the world's largest rolling stock manufacturing enterprises, the main railway operators and network companies rely on our products

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Rolling stock

Market characteristics

The railway world is characterized by a tough and uncompromising working environment. Constant shock & vibration, dust, temperature and humidity variations and electric disturbances mean that components must work under harsh conditions. This puts heavy demands on their reliability. This is the world in which Mors Smitt has invested best efforts, parts and components that work unquestioningly, offer a long effective life and result in low lifecycle cost.

Railway directives

Our products are designed and compliant to the strictest railway directives, such as EN 50155 Electronic equipment used on rolling stock for railway applications, IEC 60571 Electronic equipment used on railway vehicles, and EN 50463 Energy measurement on board trains.

Relays

Mors Smitt has the world's widest relay range fit for all railway rolling stock applications. This reliable technology was developed in the 1960's and has proven itself over time and is still the most reliable and economic solution for electrical control applications today. Innovation continues and Mors Smitt is a true relay specialist with deep know-how of applications inside rolling stock.

Protection components

Mors Smitt offers a wide range of protection components used in e.g. traction systems or for electric circuit protection; hall effect sensors, high voltage / current and differential protection relays and state-of-the-art miniature circuit breakers based on hydraulic magnetic technology.

Traction energy measuring

Mors Smitt has designed a highly innovative sensor technology enabling operators to measure the voltage and current used accurately, or generated, by rolling stock equipment achieving accurate data energy savings.

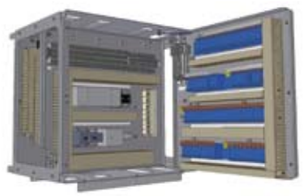
Also key control functions like catenary detection are integrated in our MSAV solution. The MSAV can be integrated in the train management or information system and works with all energy measurement systems. Our unique solution is patented.

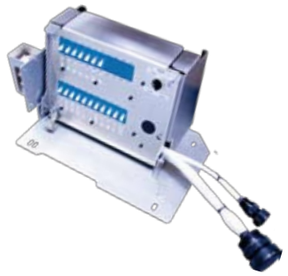


Integrated electrical solutions

Whether new built or retrofit, Mors Smitt delivers perfect and competitive on time solutions for any onboard challenge of space limitations and/ or technical requirements. No matter the size or quantities. We offer a full service from engineering, prototyping, testing, manufacturing, documentation, training and commissioning to local after sales support.

Extending train life expectancy by upgrading obsolete and outdated rolling stock is mandating replacement and retrofit of obsolete components. Many authorities recognize Mors Smitt's expertise in this field, especially for retrofit and replacement with form, fit and function compliant systems. It is an area of increasing significance.





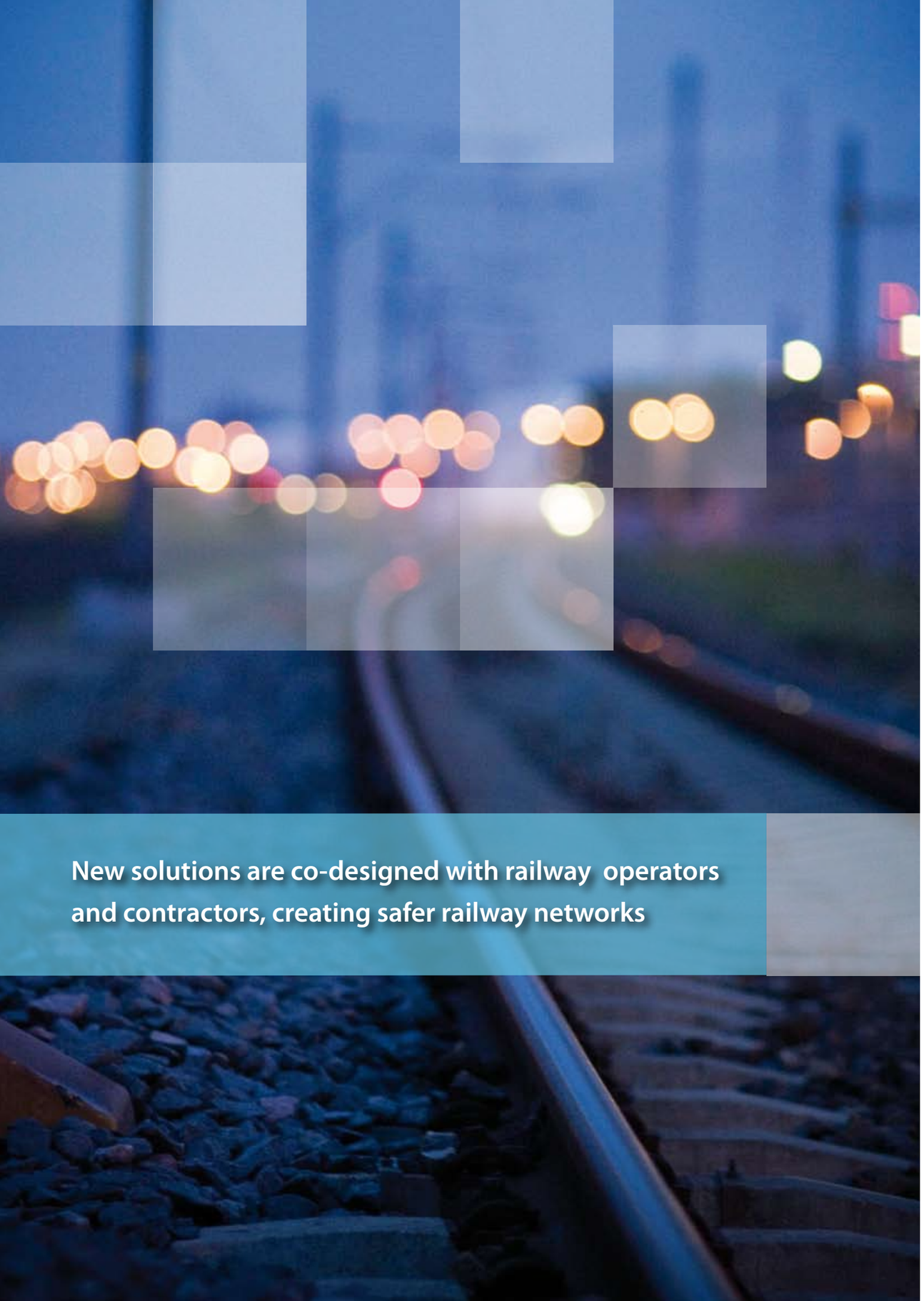
Speedometers and panel indicators

Mors Smitt offers a wide range of panel indicators based on the ultra reliable and economic moving-coil technology. Mounting is usually in the driverdesk to give direct computer independent reading of key values such as speed, volts, amps, bar, etc.

Door control units

Door control units are required for every modern railvehicle intended to move passengers. Safe operation of any passengerdoor is guarded by the DCU, translating the latest safety standards into safe door control functionalities, without compromising availability and maintainability of the vehicle. A full electronic DCU like the SDC-series monitors the 'health' of a door system and reports (dormant) failures and anomalities. When connected to a Train management system, this info will be presented user friendly.

With over 50.000 units in service worldwide our DCU's are proven reliable and are suitable for SIL2 environment and a.o. compliant to EN 50155 and IEEE 730. Design is based on 'no-single-point-failure'.

New solutions are co-designed with railway operators and contractors, creating safer railway networks

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Signalling / infrastructure

Safety critical relays

The safety critical signalling relay portfolio comes from rolling stock applications such as automatic braking units or train operating systems. There is an increasing interest to use this proven technology in trackside signalling applications because it is space saving and very economic. There are four groups; general purpose relays, semi-vital relays, safety-critical relays and vital relays. Unique relay features such as spring enchanced gravity function in combination with 'non-weldable' double make - double break contacts and weld-no-transfer function ensures compliance with the highest safety demands.

Signalling relays

Mors Smitt is an authority when it comes to signalling relays. We have in-house expertise of various standards in several networks:

- B-style relays (Netherlands, US)
- N.S1 relays (for French SNCF)
- Q-style relays (BR930/960)

Retrofitting, maintaining and re-calibration of signalling relays according to original factory specifications is part of our activity.

Protection components

Mors Smitt offers a variety of protection components, which guarantee the highest reliability and safety performances. Our product range include:

- High voltage / current protection relays (e.g. catenary voltage detection relays; third rail voltage detection relays; substation ground fault detection relays)
- Hydraulic / magnetic circuit breakers
- Hall effect sensors
- Surge protection devices (SPD)

Retrofit and replacement solutions

There is an increasing demand to replace relays or accessories in installations, which have become obsolete. Replacement solutions have to be form, fit and function compliant (FFF). Mors Smitt is an expert in this field.

Maintenance & test equipment

Today trackside maintenance demands sophisticated test and measuring equipment to ensure required system safety and reliability, and electrial circuit calibration. The company's B2 vane torque meter, selective voltage tester, rail insulation tester, notch filter, self detecting shunt bar and non voltage testers are examples of systems offering failsafe design, instant alarm and self-checking capabilities. With them at hand, railway networks are a safer place.

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Core competence

R&D - always listening carefully

After listening carefully to clients and understanding their needs, research, development and design are the critical trilogy in the Mors Smitt creative services package. Close cooperation with clients identifies all performance and safety factors important to reliable component and system operations. Experienced staff, driven by pride and commitment, think proactive and are versatile in approach.

No compromises

No compromises are made to deliver high quality MTBF components that serve clients beyond the promised lifetime. Ease of installation and replacement, elegance in appearence, intuitive operation, complete management control system and 100 % testing with unique test protocols lead to unquestioned reliability and certification to the very highest industry standards.

Proactive project management

Proactive project management mandates close teamwork, precise flow charts, the acceptance of responsibilities, open communication and smooth implementation. Type testing and commissioning are undertaken by the same committed engineers who have signed off on design and product integrity.

Minimum lifecycle cost

Over the longer term the best components are generally the most economic. Real quality inevitably has its price, but the price of a component is of minor weight when it saves a breakdown. Such components are worth many times their weight in gold. Mors Smitt strives to ensure its clients receive components and solutions offering lowest lifecycle cost.

Commitment to quality

For more than half a century, Mors Smitt has been widely acknowledged as a leader in the railway industry supply chain. Quality is the degree to which the company and its products respond to the ever growing demands made upon them. Mors Smitt understands that constant investments in the quality of its people, product innovation and quality assurance are essential to properly comply to industries' request. Mors Smitt lives by the quality of its thinking, its work and the reliability of its products.

Certification to strictest standards

For those who rightly harbour doubts, Mors Smitt has been verified to ISO 9001/2008, ISO 14001, and as one of few companies in the world, to the stricter IRIS standard.

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All equipment is **designed, tested and manufactured**
in compliance with the **strictest international standards**
and always with **reliability and safety in front of our mind**

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