Wabtec
CORPORATION

Prioritizing safety in protection & control

Mors Smitt Products & Services

Mors Smitt
A Wabtec Company

Onboard & trackside components & solutions

Mors Smitt is serving both the railway rolling stock and signalling / infrastructure markets.

The railway market demands compliance to the strictest standards.

Our added value:

- All products are qualified for the most severe conditions
- Minimum life-cycle cost
- Unique all-in-one modular and reliable solutions
- Enhancement or condition based maintenance

Serving Safety

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.

Mors Smitt is a trusted partner in your supply chain. World wide availability of 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 dependable relays with safety critical electronics.

All is manufactured to the strictest railway standards.

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Mors Smitt is part of Wabtec Corporation. A global provider of value-added, technology-based products and services for railway, transit, freight and other industrial markets, with facilities world wide.

- Railway relays
- Miniature circuit breakers
- Protection relays
- Hall effect sensors
- Signalling relays
- Train protection warning system
- Neutral zone detection
- Engineered solutions
- Retrofit & replacement solutions
- Relay life services
- CATenergy management solutions
- Panel indicators

> 10
million in use in rolling stock applications world wide

Railway relays

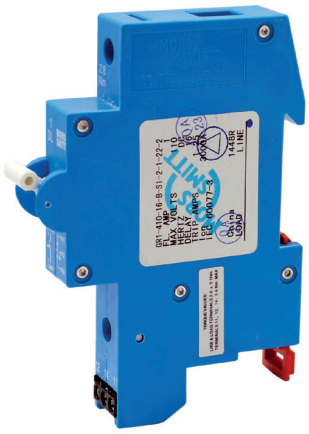
World's widest range, compliant to the strictest international railway standards

- Instantaneous, latching, timing, monitoring, safety critical, 2 - 40 contacts
- Wide range of panel or surface mount sockets/bases
- Proven safety validation in critical applications
- Galvanic separation of control and power circuit(s)
- Insensitive to electromagnetic disturbances (EMI/EMP)
- Proven reliable and low life-cycle cost (LCC)
- Fail-safe hard-wired relay logic (cyber attack proof)
- Fulfilling RAMS (HEC) requirements

Miniature circuit breakers

Mors Smitt offers a wide range of hydraulic-magnetic miniature circuit breakers.

- Current up to 700 A, voltage up to 160 VDC and 625 VAC
- Temperature-independent, selectable trip time/curve -50 %
- Options such as mid-trip, auxiliary contacts, different terminals
- Various mounting styles; rail, panel
- Complete range of accessories (such as bus-bars) are available to significantly reduce installation time



Protection relays

ST relays cover a wide range of functions in railway applications providing current or voltage detection and carry out main protection of train equipment:

- AC and DC voltage detection relay, including catenary voltage detection
- Insulation fault detection, including differential current detection
- Ground fault detection, incl. short circuit detection
- AC and DC current detection relay (traction current, motor current, overcurrent)
- 3-phases voltage detection, including phase loss detection
- No auxiliary supply needed

Hall effect sensors

Voltage and current sensors/ transducers, based on the Hall Effect principal. Available in the following ranges

- MSV: Voltage sensor, 0-5000 VAC/DC
- MSA: Current sensor, 0-2000 AAC/DC

Signalling relays

Mors Smitt is an authority when it comes to signalling relays. We offer in-house expertise and manufacturing of various national signalling relay standards used in rail interlocking systems world wide;

- Q-style / BR930 relays
- N.S1 relays
- GRS type B1 & B2 range

Mors Smitt can either manufacture new relays or provide a comprehensive refurbishment & repair service for existing units with re-certification.

Repair, retrofit, maintaining, testing and re-calibration of signalling relays according original factory specifications.

Neutral zone detection

The Automatic Power Control system (APC) opens the main circuit breaker when approaching an overhead line neutral-zone to prevent arcing and sudden deceleration

- Receiver installed on the under- carriage of the train (bogie) traction car
- Control unit (CPU) mounted inside the traction car
- Receiver continuously measures trackside magnetic field strength (to detect track-side sector magnets in accordance with Railway Group Standard GL/RT1210)
- Trackside magnets provide accurate & repeatable location determination
- Solid-state receiver with hall effect technology has no moving parts

Train protection and warning system

The TPWS+STM product range includes all the equipment required to deploy the UK Automatic Train Protection (ATP) controls for Automatic Warning System (AWS) and Train Protection Wearing System (TPWS) as a 'Stand-alone' system fully compliant with GE/RT8075 Issue 2:

- AWS/TPWS control unit
- AWS receiver
- TPWS antenna
- AWS sunflower
- TPWS DMI
- AWS/TPWS speech and sound unit

The AWS/TPWS control unit also includes discrete I/O interfaces and an integrated Specific Transmission Module (STM) fully compliant with UNISIG Subset-35 for operation in "ETCS Integrated" mode via any of three implementations specified by the National Onboard Subsystem Requirements Specification (NOSS):

- As a stand-alone system with rudimentary interfaces to the ETCS for suppression
- Partially or fully integrated into the ETCS DMI
- As a fully-compliant specific transmission module

Engineered solutions

Relay panels, circuit breaker panels, EDB electrical distribution boards, power distribution boards, relay modules / PCB's.

- Perfect solutions
- Optimizing rolling stock LCC & RAMS
- Experience

New built, retrofit or replacement of obsolete parts, Mors Smitt delivers a perfect, competitive and on-time solution for any onboard challenge of space limitations and technical requirements. We understand the need for integrated, specialised and optimised electrical solutions when (spare) parts are no longer available or improvement in e.g. energy efficiency or reduction of weight and space is required.

We offer standard, customised, and build-to-print solutions.

Our experienced engineers have thorough knowledge of train components & technologies, and we design, develop, test and deliver your solutions to the latest railway standards and directives.

All research & development, engineering, manufacturing, assembly and testing will be done in-house in one of our own factories.

Retrofit & replacement solutions

Extending life expectancy by up-grading obsolete and outdated rail network installations is mandating the replacement and retrofit of obsolete components.

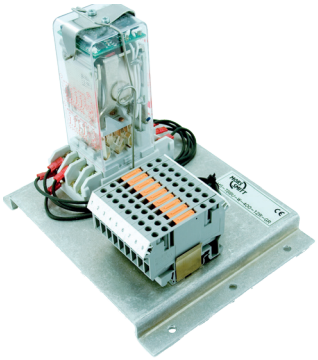
- Inhouse design and prototyping of new solutions
- Customer specific type testing and validation
- On site implementation and commissioning
- After sales support

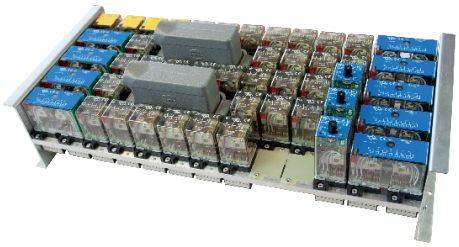
Mors Smitt delivers perfect and competitive on time solutions for any challenge of space limitations and technical requirements.

Relay life services

Products, tools and services to help our customers optimizing train system performances. Like easy fault-finding & commissioning.

- Train system analyses
- Relay testers
- Relay performance monitoring
- Maintenance consulting
- Training
- Application support





Panel indicators

Wide range of panel indicators based on the reliable and economic moving coil technology.

Mounting is usually in the driver desk to give direct independent and safe reading of key values such as speed, volts, Amps, bar, etc.

- High reliability and no maintenance
- High precision stepper motor (0.1° degrees)
- Solid technology making the pointer frame better resistant against shock and vibration
- Self calibrating, every start-up phase

Focus on RAMSHE

Reliability, Availability, Maintainability, Safety, Health, Environment.

CATenergy - energy & traction control

CATenergy is range of solution for energy measurement and traction control management, both new built and retrofit railway applications.

With accurate global measurement and energy calculation, integrated solution for train functions, detail consumption measurement and communication and added value ground server for data management, Mors Smitt gives a complete solution to car builders, operators and infrastructure managers.

- From global to detailed energy consumption on rolling stock
- Outstanding accuracy
- Interoperability with all railway rolling stock and network
- Weight and space saving with a all-in-one equipment device for all train functions (EMS, sensing device, catenary detection, short circuit & overcurrent detection)
- Modular and scalable interface (Train network, analog signal, logic output, GSM, GPS, etc.)
- Easy integration on any existing and new built train
- Ground server for data storage, processing and consumption analysis
- Energy Measurement System (EMS) compliant with EN 50463, GM/RT2132, IEC62888 and TSI

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CORPORATION

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