FRAUSCHER
SENSOR TECHNOLOGY

WHEEL DETECTION

EN

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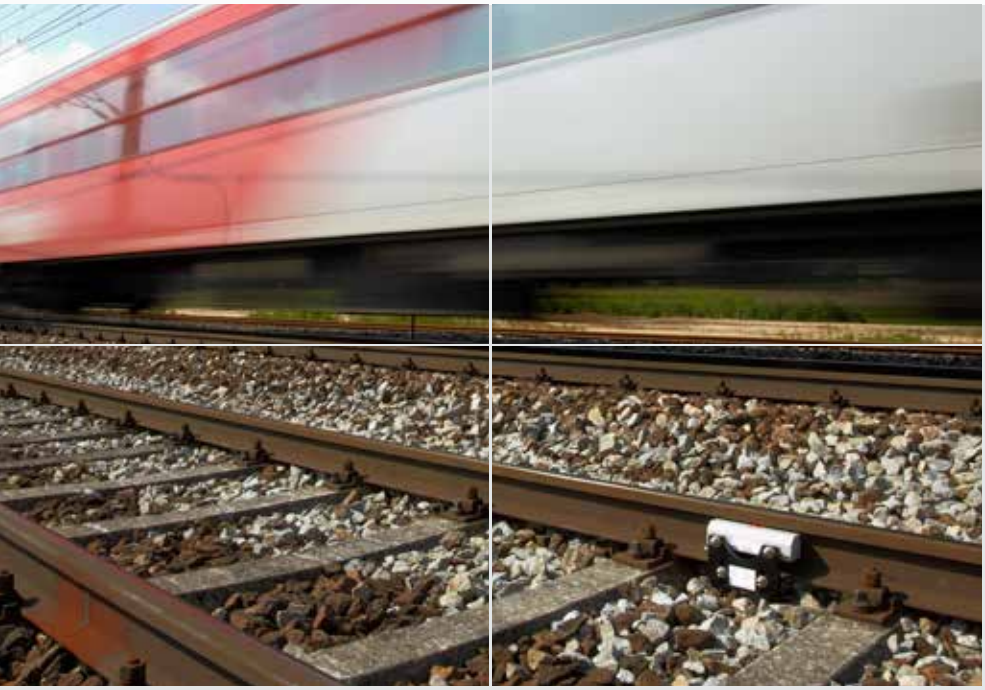
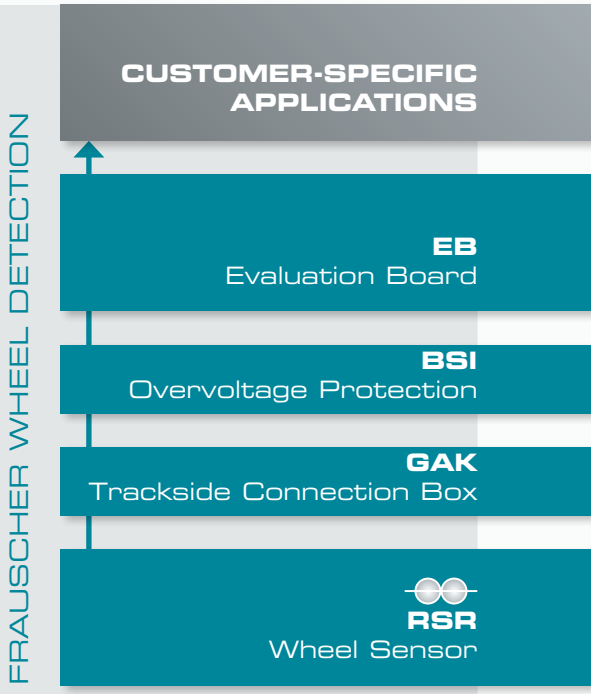
System Description





Frauscher Wheel Detection FWD is an integral part of many diverse, safe and highly available applications in railway technology and as core element of FWD responsible for the reliable detection of rolling wheels under any climatic, technical or operating conditions. The range comprises pure switching tasks, level-crossing control up to fail-safe track vacancy detection. Modularity and flexibility of hardware and software components always ensure optimal implementation of customer requirements. More and more companies rely on Frauscher Wheel Detection components for their own systems “Frauscher Inside”.

The aim and task of FWD is to provide optionally safe or non-vital digital signals, which signal the presence, speed or running direction of axles. Upon request the interface with the customer application may be implemented using electronic switching contacts (optocouplers), relay contacts (at zero potential) or be software based using a serial data protocol.

During traversing the wheel flange of the axle dampens the RSR wheel sensor mounted by means of a rail claw to the wheel flange side of the rail. This wheel sensor comprising two independent systems and based on inductive sensor technology generates the analogue signal. The signal is proportional to the damping and is transmitted as a DC signal from the trackside connection box via outdoor cable and overvoltage protection board BSI to the EB evaluation board. The respective EB evaluation board evaluates these signals and provides digital control patterns at the interface in compliance with the requirements of the customer application. CENELEC-compliant standard outputs are available for all for all levels (SIL1 up to SIL4).

WHEEL DETECTION

Applications





Axle Counting Systems

Track vacancy detection based on axle counting systems is gaining increasing importance worldwide. The FWD systems are not only found in our own axle counting systems AZF, ACS2000 and Frauscher Advanced Counter FAdC, but more and more railway operators worldwide rely on safe and reliable FWD wheel detection for their axle counting systems.

Level Crossings

There are numerous options to switch level crossings on and off using signalling systems – track vacancy detection and / or switching pulses carrying system or running direction information from FWD. All models of Frauscher Wheel Detection are being integrated by system manufacturers in level crossing systems all over the world.

Switching Tasks

Diverse applications such as points monitoring, points release or cancellation of interference signals require accurately defined trigger pulses to trigger a wide range of functions. FWD provides the respective signals using a simple method, in compact form and under any possible conditions.

FRAUSCHER WHEEL DETECTION

CUSTOMER-SPECIFIC APPLICATIONS

EB
Evaluation Board

BSI
Overvoltage Protection

GAK
Trackside Connection Box

RSR
Wheel Sensor

Measuring Systems

Measuring systems such as hot spot detection devices, flat wheel detection systems and others require reliable trigger pulses for high speed ranges and occasionally under extreme environmental conditions. Here, too, you can rely on Frauscher's long years of experience of FWD integration into such systems.

Diameter and Speed Measurement

Centralised evaluation of the analogue wheel sensor signal is the basis for reliable detection and calculation of diameter and speed of the traversing wheels. The capability of reliable real-time local detection of these parameters is a major advantage of the FWD system architecture. FWD provides the values determined using a software protocol. This affords simple and direct processing of the data in the customer application.

Customer-specific Applications

The systematic modularity and flexibility of FWD hardware and software components provides further versatile possibilities. Extensive customisation is therefore no problem - functionalities, rolling stock specifics, timing, software protocols, signal behaviour, pin assignments - Frauscher is always at the customers' disposal to develop optimal solutions.

WHEEL DETECTION

Wheel Sensors

RSR wheel sensors are the core element of FWD. They comprise two independent systems, are based on inductive sensor technology and generate the analogue signal. This signal is proportional to the damping and is transmitted as DC signal from the trackside connection box, via outdoor cable and overvoltage protection board BSI to the EB evaluation board.

The compact system design of the RSR wheel sensors inside a single housing affords simple and easy mounting. High availability and the rail claw mounting method (no drilling of rail) are distinctive features. Low maintenance cycles and low overall maintenance ensure low life cycle costs.

In compliance with Frauscher's philosophy to avoid, where possible, the mounting of electronic equipment at the rail or close to the rail, all evaluation electronics are housed indoors or in a switching cabinet off the track. Within the system the trackside connection box is only the link between the wheel sensor cables of flexible lengths and the outdoor cable.

For many years now, wheel sensors by Frauscher stand for safe and reliable operation even under extreme temperatures, huge vibrations and diverse electromagnetic interferences. Customers appreciate the easy installation, commissioning and minimal maintenance costs.

RSR121

RSR181

RSR122

FRAUSCHER WHEEL DETECTION

CUSTOMER-SPECIFIC APPLICATIONS

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Trackside Connection Box

RSR
Wheel Sensor

RSR180 / RSR181

Long lasting proven technology and continuous enhancements distinguish this wheel sensor family. Outstanding features include the suppression of electronic board adjustments at the rail and easy and fast mounting. The adjustment procedure of the evaluation boards is carried out indoors. The connection cable of RSR181 has been fitted with an easy to use connector.

RSR122 / RSR123

The RSR122/RSR123 wheel sensor family was originally designed on the basis of requirements of Deutsche Bahn DB. Meanwhile, wheel sensors of this series are in operation all over Europe and across the world. Highlights of wheel sensor RSR123 include the plug-in connector for the cable set, the automated adjustment procedure outside the danger zone. Application of our patented V.Mix technology® has significantly increased resistance against electromagnetic interferences (electromagnetic fields, linear eddy current brakes, electro-magnetic rail brakes etc).

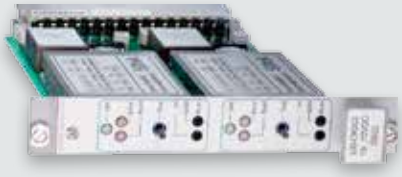
RSR121

The RSR121 wheel sensor family is the cost-efficient solution for applications without or with low safety responsibility such as shunting and marshalling, train formation or simple switching tasks. Output signals based on a standard interface (standard NAMUR) provide a universal customer interface.

WHEEL DETECTION

Evaluation Boards

Frauscher evaluation boards power Frauscher wheel sensors and evaluate the wheel sensor signals. The output of these boards acts as interface for numerous customer applications. Also available are electronic switching contacts (optocouplers), relay contacts (at zero potential) or a software interface (protocol). In addition to safety-oriented and highly available functionalities these boards also offer comprehensive diagnostic capabilities (measurement of sensor current and interface to a superordinate diagnostics system).



EIB

IMC

AEB

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RSR
Wheel Sensor

EIB

The EIB is used in combination with wheel sensors RSR122 and RSR123. Wheel sensor systems separated by galvanic coupling and operation with no need of adjustments are the features of this universal evaluation board. The customer interface can be implemented either using electronic switching contacts or relay contacts.

IMC

The IMC board can be used for all wheel sensors by Frauscher. A simple key combination will adjust the board. The output of traversing direction, detection of small wheels, suppression of an electro-magnetic rail brake, diameter and speed measurement are only a few of the options offered by the IMC board in addition to standard output of system data. The customer interface can be implemented either using electronic switching contacts or relay contacts.

AEB

In addition to the IMC board the AEB board can also be used for all of Frauscher's wheel sensors. The prominent feature of the AEB is that it provides the data using a software interface, e.g. an CAN-based protocol. This interface is adapted and integrated into superordinate systems in compliance with customer requirements.

WHEEL DETECTION

Rail Claws

With the clear purpose of making the handling of the wheel sensors more flexible and cost-efficient, Frauscher early on introduced and consistently maintained the mounting of the rail wheel sensors using rail claws. Years of practical deployment under all environmental conditions imaginable prove the validity of this concept.

Rail Claw SK140 / SK150

Frauscher offers a wide range of rail claws for flat-bottom rails, which cover practically all rail profiles worldwide. No drilling at rail, flexible positioning, easy and quick mounting or dismounting are only a few of the features of these products. These rail claws for flat-bottom rails can be used both for ballasted tracks and ballastless tracks.

Rail Claw SK420 for grooved rails

The accurate mounting of wheel sensors represents a particular challenge when grooved rails are used for trams and subways. Meanwhile, there is a proven and efficient solution for every possible requirement. These rail claws allow traversing of the wheel sensors in road areas or embedding of the wheel sensors into the pavement. Depending on customer requirements the rail claws can be clamped, welded or bolted.

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Frauscher Wheel Detection systems can be mounted, commissioned and maintained without need of special tools. Easy configuration options such as DIP switches or plug-ins provide easy handling in every respect.

Overvoltage Protection Board BSI

This board is placed in the cable termination frame in the indoor installation and protects the indoor installation, free of maintenance and with little space requirements, against undesirable induced overvoltages such as lighting or short-circuits in the overhead line.

Testing Plate PB

During the entire commissioning period it is necessary to monitor and check the correct operation of the FWD system. The testing plate PB allows easy simulation of wheel sensor traversing.

Trackside Connection Box GAK

The wheel sensor cable can be connected to the outdoor cable installation by means of a trackside connection box. As such connection requires only a clamping point and no electronics whatsoever, the connection box design is equally very simple. The standard version of the trackside connection box allows connection of up to four wheel sensors.

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Frauscher Sensortechnik GmbH
Gewerbestraße 1 | 4774 St. Marienkirchen | AUSTRIA | T: +43 7711 2920-0 | F: +43 7711 2920-25
www.frauscher.com E: office@frauscher.com

Frauscher Sensor Technology India Private Limited
Level 1, Nitesh Timesquare No. 8, M.G. Road | Bangalore-560 001 | INDIA
www.frauscher.in E: office@in.frauscher.com

Frauscher Polska Sp. z o.o.
ul. Przemysłowa 10 | 40-020 Katowice | POLAND
E: office@pl.frauscher.com

Frauscher UK Ltd.
Quatro House | Frimley Road | Camberley | Surrey | GU16 7ER | UNITED KINGDOM
E: office@uk.frauscher.com

Frauscher Sensor Technology (Beijing) Co. Ltd.
2610 Full Tower | No. 9 Dongsanhuanzhonglu | Chaoyang District | Beijing 100020 | CHINA
E: office@cn.frauscher.com

www.frauscher.com