

ultimate rail

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magazine for wheel detection & axle counting



Technological revolution

Public transportation concepts require flexible solutions

Modern Times in Rheims

Champagne metropolis takes to the tram – with Frauscher

New trade fair appearance

Innovative developments at InnoTrans 2012

FRAUSCHER

SENSOR TECHNOLOGY



Frauscher supplies wheel detection and axle counting systems for the Vienna-Salzburg line

INSIDE

MASTHEAD

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Dear Reader,

Inductive wheel detection and axle counting is generally associated with safe, highly available applications, primarily in main line operations. However the rapidly growing market of public transportation is increasingly demanding similar solutions.

Surprisingly - although less surprising for the experts - the use of these technologies in the field of tram networks presents a particular challenge. This not only applies to the infrastructure (e.g. grooved rails), but also very much to the truck geometries of the new vehicle generations of all established manufacturers.

By focusing on public transport in this issue we will show you why and how the Frauscher system philosophy works particularly effectively here. Modular systems, extreme interference immunity and the use of extensive measurement and analytical tools and methods are guaranteed even in this environment by safe, reliable wheel detection and axle counting, made by Frauscher. Nevertheless, success is always the result of a combined effort - between operators, system integrators and suppliers of the wheel detection system.

Scheduled for mid-September, InnoTrans as ever towers above the opposition. In this issue we are giving you something of a preview of our exhibition focal point under the motto "Global markets, customized solutions". Attractive technologies, a new trade fair stand and a motivated Frauscher team should spark your interest. This time our exhibit will be bigger and more modern. We have a new location in Hall 25 and we extend a warm invitation to you to come and see us there!

For free entry tickets, information about our exhibits and personal appointments please visit us at our new website: www.frauscher.com/innotrans

We look forward to seeing you,

Michael Thiel

What counts in public tr

Growing conurbations, increasing car-park prices and not least rising fuel prices are pushing trams and underground railways increasingly to the forefront of public transport infrastructures. When examined in detail, meeting the desire for maximum operational safety and efficiency is a job for absolute specialists. For years, extensive expertise and wide-ranging services (advice, laboratory tests, trials and training) and specifically adapted hard- and software versions have made Frauscher synonymous with highly efficient solutions even in this segment.



Compact arrangement and simple calibration of the wheel sensor thanks to Frauscher grooved rail claws

Railborne public transport is currently undergoing a major technological revolution, from track circuits or inductive loops to wheel detection and axle counting, since the benefits are huge in terms of functionality and operating costs. Numerous application options and very different basic conditions, however, require very specific solutions which must be developed by operators, system integrators and manufacturers working together in the interest of individual optimisation.

Software meets hardware

The application spectrum ranges from track vacancy detection for the flow of trains, point changeover protection, train approaching (indication for stops) and deletion of fault signals to CBTC fall-back plans. With its broad product portfolio, Frauscher is in the best possible position to meet these demands. The basic criterion however is the implementation of this high-tech equipment in existing vehicle and rail stock. Particularly in public transportation, wheel and truck geometries, wheel flange dimensions, electromagnetic brakes or IGBT frequency converters vary immensely throughout the world. Additional requirements in terms of rail beds, traction, communications, track profile (grooved, bullhead or vignol) or EMC influences complete the picture. All of these issues must be overcome to achieve a practical solution.

Customer-specific algorithms

A central challenge is posed by the influences on wheel sensors of the different vehicle types and their electromagnetic brakes. At Frauscher we analyse the analogue signal values to adapt the analysis algorithms and/or the trigger thresholds individually so as to create a

clear differentiation between the axle and the electromagnetic brakes and thereby guarantee reliable, safe wheel detection. Frauscher now has an extensive range of specific hard- and software components for these kinds of applications.

Intelligently placed

As well as managing interference spectra, individual solutions are also required for mounting the wheel sensors. There is often very little space available near the track, or the sensor needs to be embedded into the tramline. In this case, both the small dimensions of the Frauscher products and the specially developed rail claws for the different rail profiles (clamped, screwed or welded) with corresponding casings and covers have proven invaluable.

Configurable traversing management

Since Frauscher wheel sensors comprise two sensor systems it is possible to detect a partial traverse. As a rule, if subsequent complete traversing takes place, partial traversing is reset. If no traverse is made, the section remains in the "occupied" state and must be returned to its original setting by the interlocking system. Under certain conditions from an operating perspective it is beneficial or essential for axle counting systems to suppress a number of partial traversing procedures. In Frauscher products it is possible to configure the number of admissible partial traversing procedures according to requirement.

Counting head control maximises availability

The "Counting head control" function enables availability to be increased further by placing

Transportation is flexibility



Practical experience from public transportation projects implemented in many countries throughout the world has shown that the benefits of modern wheel detection and axle counting systems also offer huge benefits in this sector



Depiction of analogue sensor signal due to truck geometry and electromagnetic brake

wheel sensors into a form of standby mode, for instance when neighbouring track sections are "clear". In this standby mode, a freely configurable number of unacceptable incidences of damping can be suppressed. This stops the generation of an "occupied" signal and so the otherwise required reset is not necessary. Approaching vehicles deactivate standby mode and are therefore fully detected and output.

Detailed information

A current comprehensive white paper entitled "Wheel detection and axle counting in public transportation systems" sheds light on the application opportunities, requirements and different customer-specific solutions and includes best practice examples. Case studies of selected projects are also available.



For more detailed information, contact marketing@frauscher.com or visit the Frauscher website: www.frauscher.com/de/metro_trams/

The challenge of

Expertise is more than just providing top-quality technological products as became obvious during the recently completed tram project in Reims. Only the integration of specifically adapted components and the perfect cooperation between the operators and the contractors made it possible to transform an public transportation dream into smooth-functioning everyday reality in the French champagne Metropolis, with track vacancy detection from Frauscher.

In April 2011 "le tramway de Reims" went into operation after three years in construction. On an 11 km network, two lines control a total of 23 stops in an area which is home to around 70,000 people and contains some 26,500 workplaces.

The majority of the track is an overhead 750 V DC system. In the historic inner city of Reims,

however, the tram operates over a 2 km stretch without an overhead line. Here, the necessary power comes from APS contact rails which are powered only when the track is actually in use.

The contract for the delivery of the vehicle fleet and signal technology went to the French providers Alstom, who then chose Austrian high-tech products from Frauscher for the track vacancy detection system. With good reason, since Frauscher and Alstom have enjoyed business relations over several years and have collaborated on numerous joint projects.

Theory and practice

In the course of an extensive joint test phase with trial installations, all possible traversing and operating scenarios were simulated with different speeds, braking and acceleration situations etc. and the optimum Frauscher components were then selected according to CENELEC SIL4.

In the implementation in the actual environment however it was found that the theoretical calculations varied from the actual figures in areas such as installation and environmental conditions, geometry and attachment of the electromagnetic brakes. Irregularities in the start-up phase were therefore unavoidable. In close cooperation with operators Transdev and project partners Alstom, detailed measurements were taken at key points and analyses carried out in the Frauscher laboratory.

On the basis of the results, the internal system components with respect to software parameters and assembly were finally adapted, accepted and immediately replaced.



Rudolf Thalbauer, Frauscher's research and development manager for the "underfloor installation" in Reims



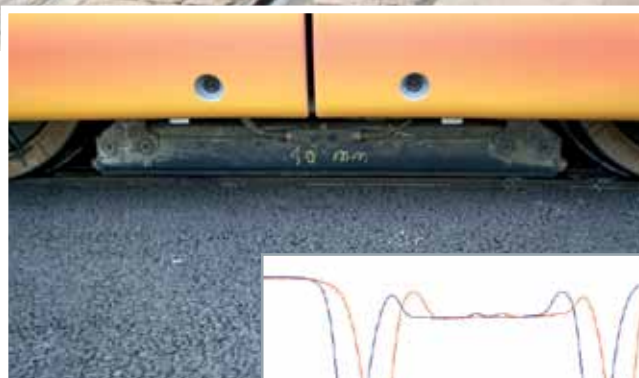
trams



Elegant, modern and reliable, the brightly coloured Alstom "Citadis" have been in operation in Reims for a year

Detected and resolved

The results speak for themselves. "Le tramway de Reims" has been running since then to the full satisfaction of Transdev and naturally of the tens of thousands of passengers for whom optimum public transportation has been more than just a buzzword over the past year.



The analogue wheel sensor current trend shows the damping of the wheel and electromagnetic brakes in Reims

Frauscher products at work in Reims

| | |
|-----------------------|---|
| Project scope: | 45 track vacancy detection systems with 70 counting heads |
| Wheel sensor: | RSR180 |
| Claw: | SK420 claw for grooved rail mounting SK140 claw for vignol rail mounting |
| Axle counting system: | ACS2000 |
| Evaluation board: | IMC incl. algorithm for electromagnetic brakes and output of traversing direction |
| Axle counting board: | ACB with adjusted diagnosis |

New trade fair appe

“Global markets, customized solutions” – under this motto, Frauscher will present its state-of-the-art wheel detection and axle counting systems at InnoTrans in Berlin. This time in accordance with the huge demand for innovation and increasing customer demand, our latest in-house developments and relevant practical examples place us as even more cutting-edge, generous and informative. Frauscher’s extensive preparations are currently running at full power.

InnoTrans



International Trade Fair
for Transport Technology
18.–21.09.2012

We have exhibited at InnoTrans for years, and this year its steadily increasing importance will be fully reflected by the Austrian high-tech company between 18th and 21st September 2012. From the latest information via perfectly prepared infotools to the already available landing page (see screenshot), everything will be thought out to the last detail. The increasing international demand for Frauscher’s development and solution competence requires sufficient time and space for expert dialogue and in-depth customer care.

Putting the individual to the forefront

Our worldwide practical experience shows ever more clearly that customer specific adaptations represent a key requirement for high availability and efficiency of wheel detection and axle counting systems. Adapting to different rail segments, markets and project-specific parameters is essential for optimum solutions and long-term customer satisfaction.

“Global markets, customized solutions” is therefore the motto under which the Frauscher team will be exhibiting the most recent highlights. Here is a taster:

Software tools

The highlight of the presentation will be the new software tools for diagnosis, configuration and simulation. Outstandingly user-friendly and intuitive user interfaces have been designed and implemented with additional functionalities for all axle counting systems on the basis of extensive usability tests and design studies. With these tools, Frauscher lays another milestone for simple and efficient project management,

configuration, repair and maintenance and adaptation options.

FAdC® – Frauscher Advanced Counter

Practical experience with the serial interface from FAdC® underlines the enormous savings potentials for system integrators and operators. As the sole manufacturer, Frauscher offers customer-specific protocols for various interlocking types and a standard protocol for those applications that have not yet implemented a safe Ethernet interface.

Public transportation

Visit Stand 303 to see a whole range of individual soft and hardware solutions and best practice examples of international applications. See also pages 4-7 of this issue.

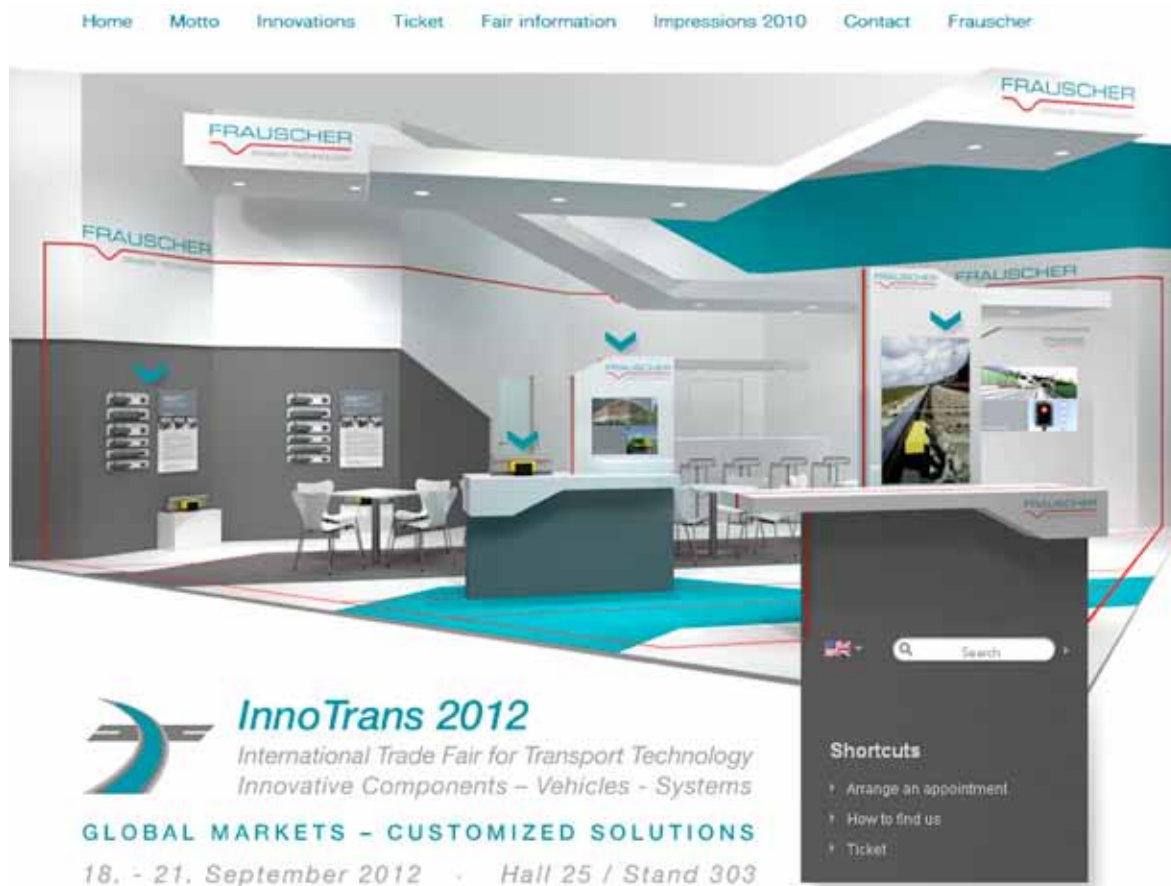
FAdC®i – Frauscher Advanced Counter industrial

The FAdC®i is the cost-effective variant of the latest axle counting generation, the Frauscher Advanced Counter (FAdC®) for reduced requirements. This system has been specially designed for train applications in accordance with the CENELEC standards up to SIL 3 and for maximum speeds of 80 km/h. System suppliers and operators can get all the benefits of the FAdC® in terms of functionality, flexibility and optimum integration thanks to the optional serial interface.

VEB speed measurement system

New opportunities for speed detecting are becoming increasingly important for a wide range of applications. The Frauscher VEB measuring

presence at InnoTrans



system provides information on speed, status and diagnostics simply and economically in real time via a serial interface. With the assistance of our wheel sensor ranges, this evaluation can take place using just one sensor.

All in all, InnoTrans is set to be an exciting event. And Frauscher will be fully committed to be there for you!



New site: Hall 25,
directly next to the
entrance to the open-
air site, Stand 303

For more information about the Frauscher stand at InnoTrans 2012 and about appointments or free entry tickets, visit our website: www.frauscher.com/innotrans

Customer service - a win-win story

With around 80 000 wheel sensors and more than 180 000 installed assemblies, Frauscher Sensortechnik GmbH enjoys worldwide success - and above-average responsibilities. Any complaints are naturally dealt with professionally and as quickly as possible with the primary aim of comprehensive analysis and rapid feedback to customers.



Damage and defects to components can have various causes: These can include lightning strike, mechanical damage or an internal fault. Due to the high safety and quality requirements and the complexity of the extensive test stages, the essential repairs may only be carried out by Frauscher. For this our specially trained team located at the company headquarters has access to state-of-the-art laboratory and measurement equipment.

Every returned component is fully analysed. Error reports are produced in order to clarify malfunctions fully and completely. This often takes place in direct dialogue with the customer who then receives an analysis report. The clarification of each individual case however is not only an expression of the company's service philosophy, it is also a key foundation for the refinement and optimisation of our overall product portfolio. Furthermore, the average time for handling complaints is just 15 working days (excluding transport) to guarantee maximum possible availability of systems and applications.



It is worth mentioning at this point that more than half of returned components are not faulty at all. This is primarily because the service staff in the field are confronted with a very wide range of different products and systems. Therefore problems are far quicker to resolve by replacing components than by studying the various instruction manuals on site. If components are returned with no obvious fault, Frauscher redistributes them with corresponding tips and instructions on their correct use.

It is also worth mentioning that years pass before Frauscher components suffer any problems by which time important details about their use have often been forgotten.

For questions on repair processing or customer returns, please contact
E: support@frauscher.com
Please send defective components for repair to:
Frauscher Sensortechnik GmbH
Service & Support
Gewerbestraße 1 | 4774 St. Marienkirchen | AUSTRIA

High-ranking visit to IRSTE

At the end of April Frauscher took part in the IRSTE convention "Modern Train Control" in New Delhi, India, as a Diamond Sponsor. Interest was high due to the current project at MRVC, the approval of the axle counting system ACS2000 for India and the specialist paper on the subject of "State-of-the-art Axle Counting Systems" delivered by Martin Rosenberger.

Even high-ranking representatives of the Indian Railway Ministry and members of the Railway Board including Kul Bhushan and Arun Saxena attended for a first-hand account and view of the Frauscher technologies.



First FAdC order in public transportation



Siemens AG Transportation Systems and Frauscher conducted a series of trials at Matzleinsdorfer Platz at the behest of Wiener Linien to increase the availability and efficiency of the track clear indication for this track intersection. The fact that this section is used by trams, underground trains and local trains poses a particular challenge.

The ULF (Ultra Low Floor) units require a specially adapted analysis algorithm which differs substantially from other vehicle types. Thanks to the flexibility and new functionalities of the FAdC axle counting system it was possible to achieve considerable improvements for this sensitive location.

ACS2000 receives RDSO approval in India

On 16.02.2012 the Research Design & Standard Organisation (RDSO) of the Indian Railway issued approval for the Frauscher axle counting system ACS2000. The approval process is based on the "Cross Acceptance" principle according to the regulations of the RDSO of the Indian Railway and lasts around a year. At the start of May, Akilesh Yadav, Director/Signal Research of RDSO, and Sanjay Kumar Singh, Chief Signal Tele Comn Engineer of Mumbai Railway Vikas Corporation Ltd (MVRC), visited the company headquarters in St. Marienkirchen and approved initial simulation tests and material inspections.

In the context of the project for MRVC, Frauscher is equipping around 1,400 track sections with the ACS2000 axle counting system and RSR180 wheel sensors at Central Railway and Western Railway in Mumbai. This approval is a decisive basis for the co-operation with the Indian Railway.



Expertise is human ...

It is old business wisdom that employees make up the true value of a company. It is a tradition that lives on at Frauscher. In fact the foundations that have made today's technological leadership possible at all are highly specialised team workers, targeting potential early on and long-term training and development concepts.



Particularly in the field of inductive sensors, specialists need long-term practical experience in different application areas to fully understand the basics and the multi-layered working principles and be able to apply them specifically. The company has been built against the back-

ground of this knowledge. To secure and expand its internationally acknowledged position we will continue to invest in staff with even greater intensity.

universities, higher technical institutes and universities strengthens this valuable nurturing of young talent. And the opportunity to gain experience in an international operation is very welcome.

One current example is Melanie Gangl, who is working on a project for process optimisation at our China site: "An exciting challenge at every level, which you need to experience in situ!"

Skilled workers

To ensure high quality standards, even in production, Frauscher also provides ongoing skills-training in the form of an innovative apprenticeship concept, whose participants can in fact later be found in key positions.

Training skilled workers and getting them to stay with the company in the long term is both a goal and a trade secret at Frauscher. Above average-length employee relationships may well be based however on the operating climate, social commitments and career perspectives, as well as excellent credentials.

In-house academy

The Frauscher academy was founded to secure high-grade knowledge transfer to companies. Here, expert knowledge and experience is regularly passed on to other staff in other departments. This is expertise which external training providers simply do not possess to this degree of detail and specialism.

Diploma, Masters and project work

Professional development and training are offered to Frauscher employees and also to students. Targeted cooperation with technical



Melanie Gangl sees China as a challenge

Frauscher appointments

Trade fairs/conferences:

ASPECT IRSE in London:
10 – 12 September 2012

CORE in Brisbane:
10 – 12 September 2012

InnoTrans in Berlin:
18 – 21 September 2012,
Hall 25, Stand 303

Product training courses:

10 – 12 October 2012 (German)

17 – 19 October 2012 (English)

We shall be happy to provide details about our training courses or arrange an individual appointment with you. If you have any questions, please contact: Elke Gimplinger, T: +43 7711 2920-9284 or via email: training@frauscher.com



Impressions from the Infra-Rail trade fair in Birmingham in May 2012