TRACKING
Frauscher Tracking Solutions FTS
More relevant information with less effort.

Ever since the foundation of Frauscher Sensor Technology this thought is the driver behind our high innovative strength.

We are consequently developing existing as well as new products based on modern technological approaches to ease the access to information. This allows system integrators and operators to manage, monitor, protect and efficiently operate their network.

We are going ahead keeping the focus on simplification of handling as well as maximizing the output. This is just one of the many reasons why our customers all around the world are already best-equipped to face up to the challenges of the future.
Experience the new generation of live tracking.

Track and monitor trains, assets and personnel in real-time using one single solution – on and near your tracks.
A new way of tracking: Distributed Acoustic Sensing.

Distributed Acoustic Sensing (DAS) transforms fibre optic cables into virtual microphones. What emerges from that is a fascinating potential for monitoring train operations as well as railway infrastructure.

On the principle of DAS the new Frauscher Tracking Solutions FTS can be operated using only one single core of a fibre optic cable. By sending laser pulses from an optical unit into the fibre 2500 times a second, the fibre is transformed into a whole sensor. Sound waves hitting the cable cause minimal changes in its structure. This leads to a change in the laser pulse’s reflection, which can be measured and set in relation to the time that has passed since sending out the pulse. Thereby one unit can monitor up to 80 km of track.
Learn more about DAS in the railway industry.

Frauscher Tracking Solutions FTS, based on DAS, opens up a wide range of applications for train tracking, asset condition monitoring and security.
**A broad range of reliable information.**

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<th>TRAIN TRACKING (NON-VITAL)</th>
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<th>SAFETY &amp; SECURITY</th>
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<td></td>
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<td>▪ Animals</td>
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</table>
See your trains running in real-time.

The display unit provides clearly arranged delivery of all information as well as accurate classification of tracked events as a basis for planning and implementing appropriate activities.

Information can also be provided to mobile devices through text messages or even drones that can be sent to appropriate locations according to precise GPS data. Additionally, interfacing with IT networks is enabled.

Whichever option is chosen, FTS allows for immediate response, either as a standalone or as a combined solution.
Systems of Frauscher Tracking Solutions FTS.

FTS can be combined with proven axle counters and wheel detection systems. Thus, we can provide our customers with massively expanded options.

- **FTS-FAS**: Frauscher railway specific DAS solution
- **FTS-FAS⁺**: Combining FAS and wheel detection systems
- **FTS-FA⁺**: Combining FAS and axle counters
By combining comprehensive knowledge about DAS and the railway industry’s requirements, Frauscher has developed the Frauscher Acoustic Sensing FAS. This railway specific DAS system forms the base for a wide range of applications. It consists of four units.

Frauscher Acoustic Sensing FAS uses newly developed algorithms to categorise detected events. On that basis, specific alarms and reports can be generated and provided via a single user interface.

FTS-FAS
FTS-FAS system architecture

1. **Optical Unit**
The optical unit converts the fibre optic cable into a distributed sensor. It sends a laser pulse along the fibre cable, measures the intensity of returned Rayleigh backscatter and outputs a signal in real-time.

2. **Processing Unit**
The processing unit transforms the signal into power spectrums. It runs filters and implements signal processing techniques to classify events of interest reports.

3. **Application Unit**
The application unit adds geographic information, collates all alarms into a searchable database, sends alarms to a defined interface and monitors the system health.

4. **Display Unit**
The display unit provides clearly arranged delivery of all information as well as accurate classification of tracked events as a basis for planning and implementing appropriate activities.
FTS-FAS capabilities

**TRACKING**
- Monitoring of up to 80 km of track per unit in real-time.
- Track and monitor trains, assets and individuals.
- Accuracy of detection up to 10 m along the fibre.

**INFORMATION**
- Providing corresponding route km or GPS coordinates of detected activities.
- Detection, classifying and alarming for multiple events.

**SIMPLIFICATION**
- Various interfaces and optional display unit as GUI.
- Providing one single solution for various application areas.
- Use of existing fibre cables allows fast and cheap installation.
FAS can be combined with proven wheel detection systems. Overlaying data from both approaches increases the possibilities of applying gathered information significantly. Trains can be assigned to tracks and their length can be determined more exactly. Furthermore, detected events and asset conditions, such as flat wheels, can be localised accurately. Thus an integrated solution with wheel detection systems enables the use of FAS on multi-track lines, where several rails are connected by numerous switching points.
FTS-FAS+ capabilities

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**SIMPLIFICATION**
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- Use of existing fibre cables allows fast and cheap installation.

**INTEGRATION WITH WHEEL DETECTION SYSTEMS**
- Wheel sensor data ensure track identity.
- Enhanced information about single axles and train length.
In combination with a modern axle counter, such as the Frauscher Advanced Counter FAdC, FAS provides valuable data to support complex and safety-relevant applications, given that the axle counter operates on a CENELEC SIL 4 level. Using FTS-FAdC+ the axle counter can be used as a failsafe system for track vacancy detection, while data input from FAS, such as dynamic train location or estimated time of arrival (ETA), can be added as well as various asset condition monitoring and security applications.
FTS-FAdC⁺ capabilities

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**INFORMATION**
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**INTEGRATION WITH MODERN AXLE COUNTERS**

- Wheel sensor data ensure track identity.
- Enhanced information about single axles and train length.
- Axle counter for fail-safe track vacancy detection (SIL 4).
FTS-FAdC+ information

The best of the both worlds — the combination of FAS and axle counters creates a wide range of valuable information.

**INFORMATION FROM FAS**
- Position
- Speed
- Acceleration
- Direction
- Train length
- Estimated time of arrival (ETA)
- Rail defect
- Flat wheels
- Catenary flashover
- Rock fall
- Trespassers
- Cable theft
- Vandalism
- Animals
- Etc.

**INFORMATION FROM AXLE COUNTER**
- Clear/occupied indication including track identification (SIL 4)
- Number of axles
- Speed
- Direction
- Diagnostic data
Benefits

Continuous, real-time tracking along total network.
- 80 km per unit
- Networking of units

Multiple applications with one solution.
- Train tracking
- Asset condition monitoring
- Safety & Security

Dramatic reduction of whole life cycle costs.
- No wayside components and using existing fibre
- Minimum maintenance

Increased safety
- Minimal maintenance lead to reduced working time on track

Attract young engineers
- Modern technology well-versed for railway engineers and maintainers

Low carbon footprint
- Less equipment and minimum maintenance lead to conserve resources and nature
If you have any questions, please feel free to contact us:

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