

## Keeping rolling stock on track.

For more than 15 years **Micro-Sensor** has been synonymous for safety sensors in railway industry. The company specializes in inertial sensors for acceleration, vibration, angular rate and inclination measurement. **Micro-Sensor** contributes significantly to increasing efficiency in railway transportation.

**Micro-Sensor** is a part of the Micro-Epsilon Group, the supplier of world's largest range of high-precision displacement sensors, temperature sensors as well as measuring instruments and systems for industrial applications.

We are proud to be Micro-Epsilon's **competence center for inertial sensors** and develop digital sensors for **acceleration and inclination** for industrial applications. Available at [www.micro-epsilon.de/inclination-acceleration-sensors](http://www.micro-epsilon.de/inclination-acceleration-sensors)

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 **SENSORS FOR TRAINS AND VEHICLES ON RAIL**



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# Sensor solutions for safety and efficiency in railway applications

## Derailment protection

Micro-Sensor's **AccTRANS** measures the bogie vibration caused by a difference between the track gauge of the rail and the track width of the train's wheels. This causes a pendulum movement of the train in the track bed. If the acceleration of this movement exceeds a certain amplitude, it may lead to derailment of the train. Our sensor detects this oscillation amplitude and provides a safe measurement result for evaluation by a train control system. In this way, an appropriate signal for slowing down the train can be issued in time, or initiate an automatic braking of the train.



- Improvement of transport safety
- Reduction of train accidents

## AccTRANS

**ANALOG ACCELERATION SENSOR FOR OUTDOOR APPLICATION ON TRAINS.**

- Adjustments of electrical parameters possible
- High, low or bandpass configurable
- Easy integration thanks to compatibility with onboard power supply



## Predictive maintenance

Mechanical wear of the axle bearings leads to a certain vibration behavior. **AccTRANS** measures these vibrations and outputs them as an analog current or voltage signal. This signal can be analyzed with regard to the vibration behavior and thus enable conclusions about the state of mechanical tensile components can be drawn.

With the angular rate sensor **CoriSENS** the number of rides in right or left-hand curves can be detected. Thus, conclusions and differences in the wear on the wheel-sets of the train can be determined.



- Optimization of maintenance intervals
- Increasing availability

## Driver assistance systems

Curve detection is one of the key indicators for optimizing rail travel times and safety. The right time for the re-acceleration in the passage of curves is the sensitive issue. Problems can arise here, when trains exceed a certain length. It gets more difficult for the driver to see the train's end reaching the curve exit.

**CoriSENS** measures the angular velocity of a train while driving along curves and can thus detect the curve vertex. The optimal acceleration point can be calculated and output as a signal to the driver assistance system. More efficient accelerations can shorten travel times and optimize the utilization of fleets.

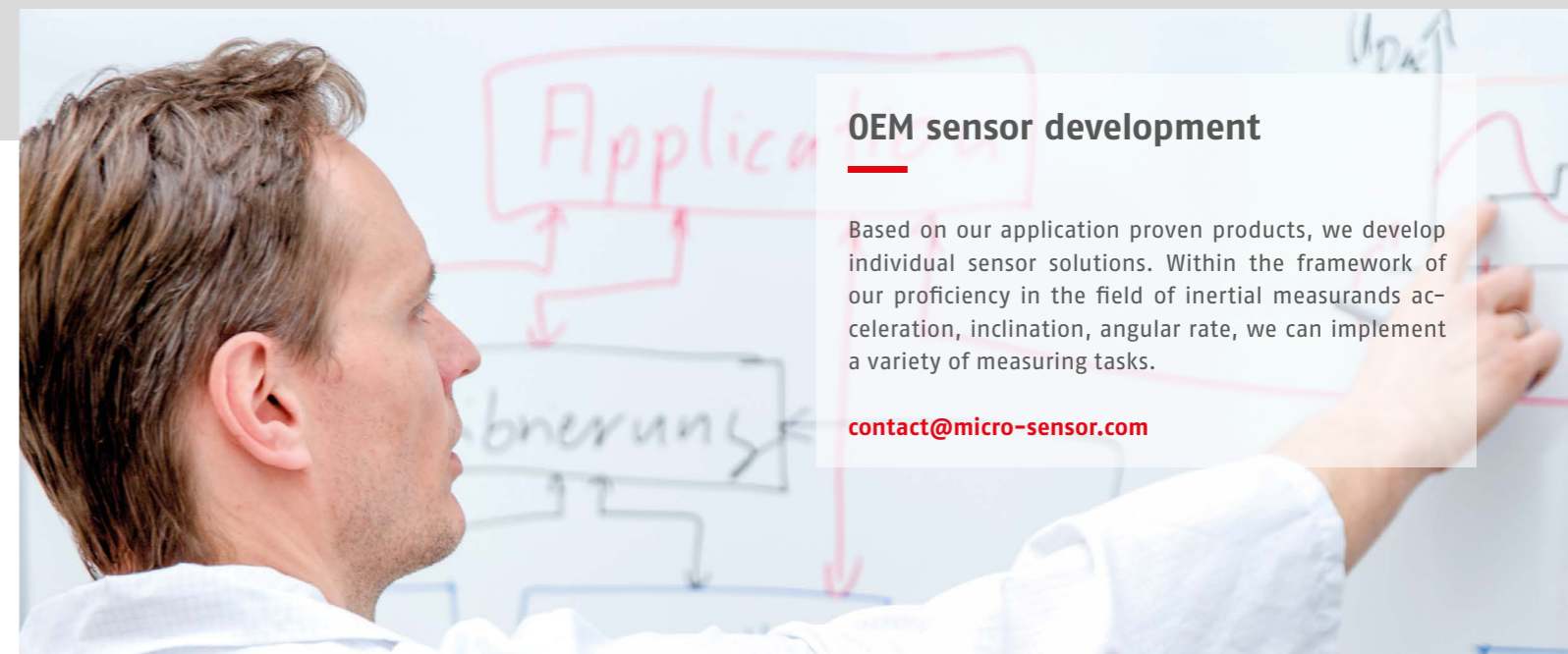


- Improvement of transport safety
- Increasing availability

## CoriSENS

**ANGULAR RATE SENSOR FOR MEASURING ANGULAR VELOCITY.**

- Reliable raw data input for driver assistance, train control and rail automation systems
- Increasing safety and availability of train fleets
- Individual development of measurement range, housing, interface, etc.



## OEM sensor development

Based on our application proven products, we develop individual sensor solutions. Within the framework of our proficiency in the field of inertial measurands acceleration, inclination, angular rate, we can implement a variety of measuring tasks.

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