



zentrak WHEEL DEFECT DETECTION zentrak WEIGHING IN MOTION

Diagnosis of Wheel Defects and Vehicle Weights

Description

Growing rail traffic worldwide requests higher safety standards and lower maintenance costs at the same time. An essential aspect is a continuous, trustworthy monitoring of wheel-rail interaction forces.

Wheels of rail vehicles are exposed to high wear and tear. This may result in geometric wheel defects. The function Wheel Defect Detection and Weighing in Motion (WDD/WIM) or Wheel Impact Load Detection (WILD) measures on a continuous basis every wheel of the fleet and checks for any deviating force levels during normal train operation. Besides detecting wheel defects, the function is used as a dynamic rail scale at the same time. Vehicle weight and load distribution are monitored during every passage and an unbalance or overload can be recognized in time. Assistance for optimal payload usage is available as well.



WDD
Wheel
Defect
Detection



WIM
Weighing
In
Motion

System advantages

- » Coverage of the complete circumference of the wheel
- » Unparalleled ease of installation
- » Clamp-on sensors: No drilling/welding/ gluing required
- » 100% electromagnetic compatible
- » Self-calibration, self-diagnostic and health monitoring
- » No influence on regular track maintenance
- » Applied in various climate zones, in tunnel environment and on high speed tracks
- » Energy efficient module in compact design
- » Combinable with other zentrak functions



FIBER OPTIC SENSING TECHNOLOGY

Forces exerted by the wheel on the rail are captured by optical sensors clamped under the rail. At a high scanning rate, the deformation of the rail is measured. Every wheel is identified during a train passage and data reports on weights and defects are generated accordingly. Alarms are displayed in real-time and defective wheels are identified together with their exact position in the train and under the vehicle. The system software differentiates between various types of wheel defects like wheel flats, out of roundness and polygonization.

Installation and maintenance of the sensors are unparalleled. Applying fiber optic technology in the sensor design guarantees electromagnetic compatibility in any railway system.

The small, lightweight and energy efficient design of the module allows for easy co-location with other diagnostic functions in a cost-effective way.

Technical Specification	
Train speed	5 to 450km/h (recommended for WDD minimal 30km/h)
Train length	up to 5000m
WDD coverage	~3x wheel circumference
Axle distance	0.7 to 40m
Wheel diameter	200 to 1600mm
Vertical static axle load	2 to 40t
IP class optical sensors	IP68
Environment	-40 to +70°C
Accuracy of vehicle weighing	up to ±3%

Options and variants



Tunnel



Train
Talker



Slab
Track



Solar