

Clear the Way for the Modular Inspection Platform

For years, our “Image Processing” department has been working on hot axle box detection on railroad tracks. The aim is to detect hot axle bearings and stationary brakes on passenger and freight trains so that they can be stopped, before serious problems occur.

Sensors in the track bed determine the heat radiation of passing trains without contact and calculate the temperatures from this. If they are outside the standard range, the next control center is automatically informed; typical alarm limits for axle bearings are 100 degrees, for brakes over 300 degrees depending on the type.



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Universal Platform for Web Inspection

The requirements in terms of safety and reliability have increased over time: Not only the sensors should work flawlessly, the entire system must work trouble-free and be protected against manipulation from the outside. “For our partner, we are developing an overall system that goes far beyond pure temperature measurement,” says project manager Thomas Redenbach, describing the collaboration with Progress Rail Inspection and Information Systems in Mannheim. “We are implementing the system as a modular platform: the individual components communicate in encrypted form via secure communication protocols. Users authenticate themselves in a multi-stage login process to protect the platform as well as possible against hacker attacks.” In addition, subsystems can be redundant, which provides increased fail-safety.

The sensor technology is flexible: as required, modules can be retrofitted to detect protruding loads on freight trains, flat spots on wheels or dragging components on the track.

Fault detection during drive-by: Acoustic sensor detects wear condition of axle bearings.

New are acoustic sensors that can detect incipient bearing damage from the noise of a passing train.

Sensor Fusion Enables Predictive Maintenance

The universal platform can combine measured values from different sensors: For example, temperature and acoustic data can be used to determine the wear condition of axle bearings. It is also possible to network several locations in order to track trains over time. This data can be used to detect impending component failures at an early stage and to adapt maintenance cycles to actual wear. The system will go into test operation this year.

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