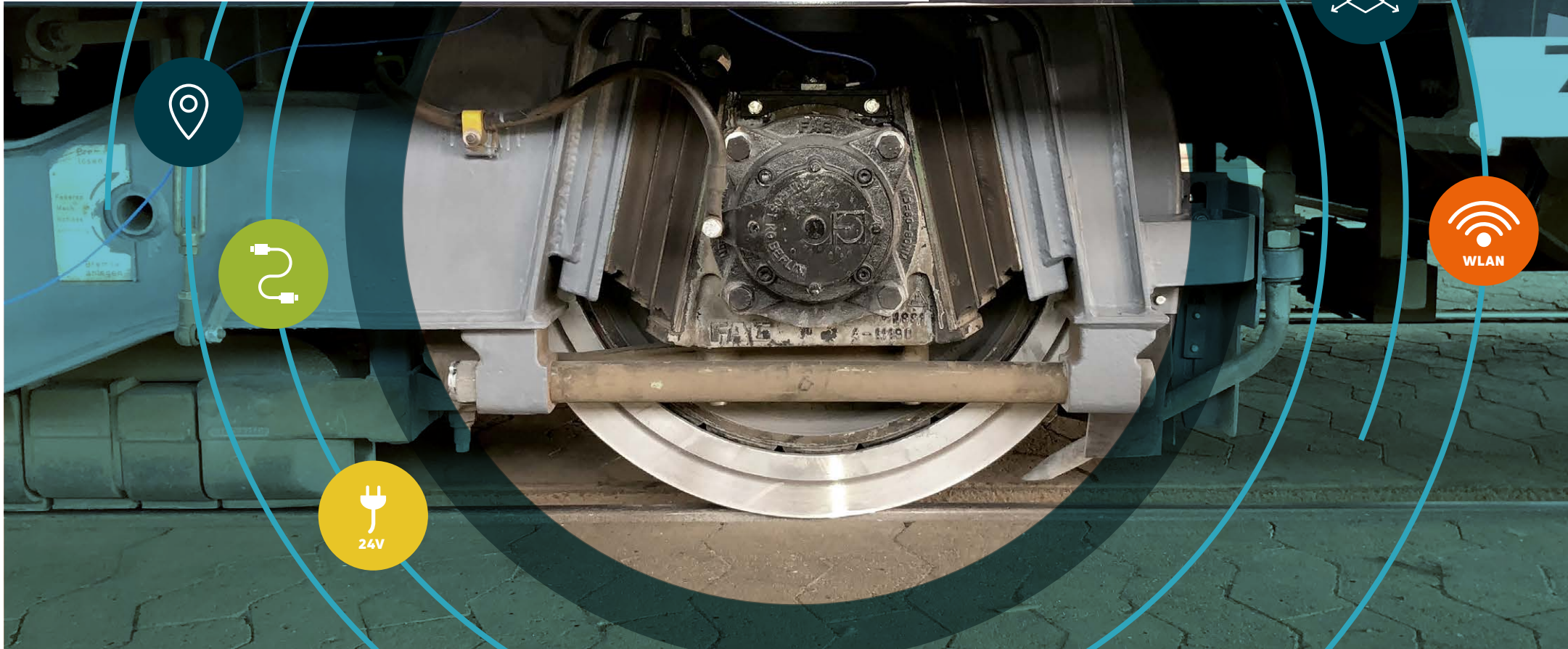


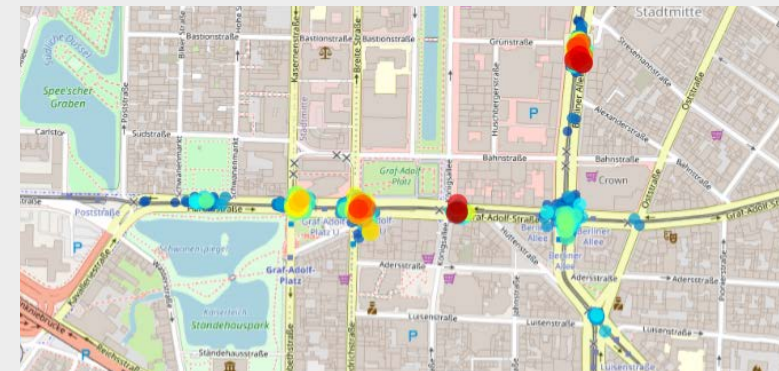
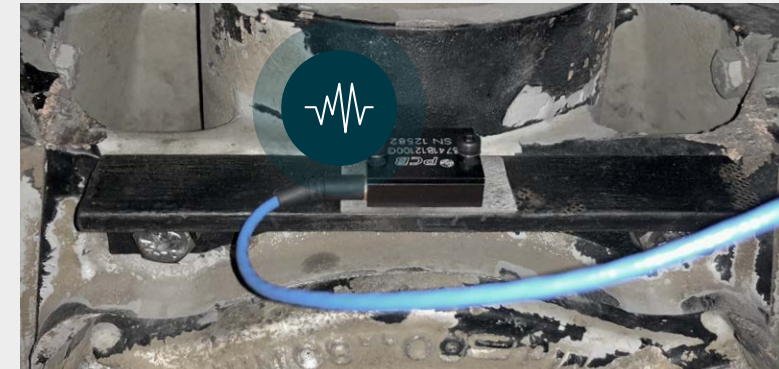
# ONLINE MONITORING OF RAIL TRACK FAULTS IN PUBLIC TRANSPORT SYSTEMS



www.nemi.one

www.i4m-tech.de

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| <b>OBJECTIVE</b>   | <ul style="list-style-type: none"> <li>• Condition monitoring of the public transport track network through automatic and continuous localization and evaluation of rail defects</li> </ul>  |
| <b>PERIOD</b>      | <ul style="list-style-type: none"> <li>• In operation since 2017</li> </ul>  |
| <b>CHALLENGES</b>  | <ul style="list-style-type: none"> <li>• Clean and selective detection and evaluation of rail defects</li> <li>• Integration of the measurement system into vehicles in regular operation</li> <li>• Localization in the track network and display in a map system</li> <li>• Localization of rail vehicles in the tunnel</li> <li>• from Big Data to Smart Data at the edge: immediate data reduction from raw time data to relevant defect information decentralized on the moving measurement systems</li> </ul>  |
| <b>REALIZATION</b> | <ul style="list-style-type: none"> <li>• Equipping several trains with acceleration sensors on the wheel bearings and one on-board measuring box each with edge computing capabilities</li> <li>• Continuous measurement and evaluation of acceleration signals and linking of these with GPS position data</li> <li>• Localization in the tunnel via beacon system and meter counter</li> <li>• Power supply via 24 V vehicle-grid</li> <li>• Data reduction to relevant information about local track condition by edge computing</li> <li>• Data transmission of temporarily stored data via WiFi using MQTT as soon as the vehicle is in the depot</li> <li>• Customer-oriented presentation of the acquired and evaluated information in a dashboard</li> </ul> |
| <b>ADVANTAGES</b>  | <ul style="list-style-type: none"> <li>• Reduction of loads on the vehicle</li> <li>• Reduction of noise pollution on residents</li> <li>• Focusing of maintenance measures</li> <li>• Data reduction through edge computing by a factor of &gt; 10,000</li> </ul>   |









*„i4M technologies’ customized solutions for Rheinbahn reliably identify faults in our track network before we can detect them by visual inspection. In doing so, the system makes a decisive contribution to reducing vehicle damage and noise pollution for residents. The flexible team at i4M always ensures that our projects are implemented quickly. We can highly recommend a cooperation.“*

**Jörg Klaeden**

Prokurist, Bereichsleiter Fahrzeuge, Stellv. Betriebsleiter BOStrab u. BOKraft. Rheinbahn AG



-  Data transmission via WiFi when vehicle in depot
-  Data transmission via cable
-  OnBoard measuring box  
Connection of GPS and sensors  
Edge computing
-  Acceleration sensor
-  GPS for localization
-  Connection to vehicle data bus for localization in tunnels