

A joint solution for wheel flat detection and axle load measurement

Summary

TagMaster's RFID system plays an important role ensuring that the wheel quality and axle load measurements are matched to the correct wheel pairs on the Dutch Railway. The system called "Gotcha" has considerably contributed to the improved wheel quality and reduced maintenance costs of the Dutch Railway. TagMaster's long-range Readers have been installed at each of the measuring stations and TagMaster's high-speed ID-tags are mounted on over 1,500 passenger vehicles. The TagMaster system enables automatic update of the maintenance schedule as well as ton kilometre charges.

Challenge

Defects on train wheels, such as wheel flats and cracks, can damage the track and may cause disastrous accidents. Wheel quality check-ups are therefore of high priority within railroad security. Traditionally all passenger trains had their wheels manually checked at scheduled inspections every 3rd month. Bad quality wheels could therefore be in operation for a long time before a defect could be revealed. To improve the maintenance process NedTrain Services needed a condition-based system to identify bad wheels at the earliest possible stage. Additionally, the infrastructure owner ProRail needed an accurate tool for charging the different operators per ton kilometre.

Solution

To meet the requirements of the maintenance and infrastructure owner, Lloyd's Register Rail and Baas R&D developed the Gotcha system. Gotcha stations have been installed at 17 different locations along the Dutch railroad network to measure the wheel quality and axle load each time a train passes by at full speed. The Gotcha system uses fibre optical sensors to measure the vibration of the rail. The result is analysed in the local station and translated into wheel quality and axle load values.

The integrated TagMaster system ensures that the actual measurements are matched to the correct wheel pairs. Each wagon is equipped with a TagMaster high speed



ID-tag, allowing identification at speed (up to 160 km/h). In order to monitor the exact passing time (1 /100 sec) for each wheel pair, special software has been developed by TagMaster. Any deviation from the set quality standard of the wheels is reported via an on-line telecommunication link from the local station to the maintenance centre. The information provided enables immediate decisions to take a wagon out for service if required. Due to the success of the system, another 24 Gotcha stations have been installed on the Dutch railway primarily for the axle load measurements.

Conclusion

By combining the GOTCHA quality control and weighing system with TagMaster RFID technology, the maintenance company NedTrain Services can uphold a continuous control of wheels on all Dutch passenger trains. The quality level of the wheels has dramatically improved, thus contributing to a higher security on the Dutch railway. The infrastructure owner ProRail today possess a system that ensures that the wear on the track due to wheel defects is minimized, as well as an efficient and accurate way of charging the operators per ton kilometre.

Products used:

S1503 WiseMan Long-Range Reader
S1510 HandHeld Reader
S1456 MarkTag HDS