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Accurate, Repeatable Rail Wheelset Measurement Boosts Vehicle Availability

ÖBB-Wagenmeister, Graz, Austria

ÖBB-Wagenmeister slashed rail vehicle inspection times by adopting fast, accurate handheld wheelset measurement

ÖBB-Production wanted to speed up its ÖBB-Wagenmeister division's train inspections to increase vehicle availability for its customers.

It chose Hexagon's NEXTSENSE CALIPRI C42 handheld measurement devices for precise and reliable measurement of wagon wheelset dimensions.

Deploying the Hexagon solution streamlined the inspection process and reduced vehicle downtime by 75%.

Part of ÖBB (Austrian Federal Railways), ÖBB Produktion offers its customers a wide range of railway services, from providing 6,500 trains daily to cleaning, refuelling and brake testing. Vehicle inspections are handled by its ÖBB-Wagenmeister division where 650 'Wagenmeister' – wagonmasters – are responsible for monitoring the safety and quality of rolling stock on ÖBB's infrastructure.

Measuring wheel profiles is a key part of the technical inspections performed by wagon inspectors on freight vehicles whenever irregularities occur during regular operations.

Efficient Inspections with CALIPRI C42

"The biggest challenge is completing the inspection process as quickly as possible for our customers to avoid delays and delivery issues," says Christian Trummer, who coordinates 220 wagonmasters as head of ÖBB Technical Wagon Services in the south of Austria.

A project called 'Technical Wagon Service – Wagonmaster Next Level' confirmed that a better way to measure was required. "*This project aimed to meet the needs of our customers and expand the technological capabilities in the technical wagon service,"* says Christian. *"It became clear that optimising the measurement processes for measuring damaged wagons was necessary,"* continues Christian. *"We realised that the previous process was very labour-intensive, involving 10 to 12 steps to transport a wagon after a damage report."*

Finding a Better Way to Measure

One team member was aware of Hexagon's NEXTSENSE CALIPRI range of measurement tools and made contact with the company, which is located in the same town as ÖBB-Wagenmeister's headquarters. *"Since Hexagon | NEXTSENSE is based in Graz like us, it was particularly obvious that we should consider their product,"* says Christian. *"The CALIPRI measurement systems met all the requirements set out in our General Operating Instructions and this convinced us.*

ÖBB-Wagenmeister decided to evaluate the CALIPRI C42 for non-contact profile measurement of wheel profiles, wheel diameters and wheelset back-to-back distances. This lightweight, handheld and easy-to-use profile measuring device is widely used within the rail industry to support the inspection process during maintenance.

Precise and Repeatable Measurements with the CALIPRI C42

Purpose-made for measuring heavy rail equipment, the wireless CALIPRI C42 uses laser light section technology to provide rapid and correct evaluations with high repeatability. A single device covers the complete rail application range, including high-speed and regional trains as well as cargo stock.

An employee from the team measuring the inner clearance within wheelsets, this measurement is a challenge for wheelsets of freight vehicles

In addition to wheels, optional software modules for the multifunctional CALIPRI C42 enable it to measure the widest possible range of brake discs, rails and switches. ÖBB Wagenmeister added a 'Back-to-Back' measurement gauge to measure the inner clearance within wheelsets and Hexagon created a special 'Wagenmeister-Gauge' with a customised measurement plan to suit its needs.

"NEXTSENSE supported us excellently, especially in modifying the device for track use," says Christian.

The latest version of the back-to-back gauge, as used by ÖBB Wagenmeister, features more robust contact angles while its length can also be adjusted. This simplifies the handling of the gauge, increases its flexibility and means it can be adjusted at the trackside. The downtime of a damaged vehicle could be significantly reduced thanks to the optimised workflow.

Streamlining Wagon Measurement Delivers Higher Availability

In 2023, ÖBB-Wagenmeister acquired a set of CALIPRI C42 devices and started to evaluate them in a pilot project. After exhaustively analysing the results, it pressed ahead with a full roll-out and trained a group of 20 staff. The C42 was in regular operation by the autumn of 2024.

"The CALIPRI system reduces the wagon downtime from 10-12 days to only 2-3 days."

Christian Trummer
Head of Technical Wagon Services, ÖBB

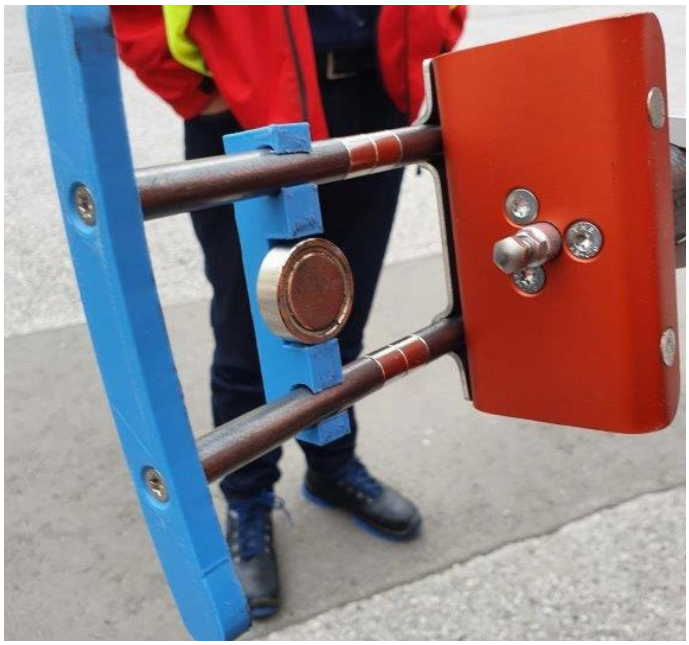
"The CALIPRI C42 system reduces the wagon downtime from 10–12 days to 2–3 days," says Christian. *"We can now perform the measurement immediately on-site, which saves time and significantly improves the processes, ultimately increasing the availability of the wagons. The devices are used between 800 and 1,000 times per year, depending on the need and the number of measurements, and the measurement data is a central part of our process optimisation,"* explains Christian. Measured dimensions from the CALIPRI C42 can be displayed on a tablet PC or directly on the device's display. This has enabled ÖBB Wagenmeister to build a streamlined workflow where the measurement data flows from the device to the tablet and then directly into its own systems.

"Previously, measurement protocols were filled out manually and transmitted manually," explains Christian. *"Today, we automatically generate a PDF with the measurement data that is immediately sent to the damage wagon dispatcher at the RCA . This step of digitalisation has significantly helped us work faster and more efficiently."*

Fast, Dependable Measurement that's Proven for Rail Applications

ÖBB-Wagenmeister is very happy with its new wagon measurement system. The Hexagon devices fit its needs exactly and the level of local support is excellent. The C42's simple calibration procedure is an added bonus. *"From the very beginning, it was clear to us that we would work with Hexagon | NEXTSENSE because CALIPRI meets all our operating requirements, and provides precise and reliable measurements,"* says

CALIPRI C42 enables precise and repeatable measurements even with wheelsets that are difficult to access



The gauge has more robust contact surfaces and an adjustable length, making it easier to handle

Christian. *"The calibration of the devices on-site and the service support in Austria are also important to us, as they provide significant advantages."*

"We plan to acquire more devices in the future," concludes Christian.

Hexagon is a global leader in digital reality solutions, combining sensor, software and autonomous technologies. We are putting data to work to boost efficiency, productivity, quality and safety across industrial, manufacturing, infrastructure, public sector and mobility applications.

Our technologies are shaping production and people-related ecosystems to become increasingly connected and autonomous – ensuring a scalable, sustainable future.

Hexagon's Manufacturing Intelligence division provides solutions that use data from design and engineering, production and metrology to make manufacturing smarter.

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