

HEXAGON

The CALIPRI X – An On-Track Wheel Profile Measurement System



NEXTSENSE, part of Hexagon AB, is at the forefront of rail measurement technology, setting standards for accuracy and reliability.

Its **CALIPRI X** automated, permanently installed on-track wheel profile measurement system eliminates time-consuming and costly manual wheelset measurements, identifying out-of-tolerance areas in seconds. As a result, the system cuts unplanned fleet downtime, reduces costs and increases maintenance efficiency.

Data-Driven Insights

CALIPRI X's enhanced connectivity and embedded analytics puts data to work to deliver conclusive

results in seconds. Moreover, it's easy to install, even on frequently used tracks such as in front of depots, workshops, washing facilities or in sidings. This enables regular measurements to be automatically taken to support safe operations, in line with European standard EN 15313, which covers wheel profile, diameter, back-to-back distance, equivalent conicity, camber and wheel toe.

"We know, from conversations we've had with customers, that they want data captured from as many profiles as possible, which is what we've set out to do," says Philipp Sandheigl, NEXTSENSE's Team Leader Railway Applications.

"With CALIPRI X it's possible to automatically capture all the required information, without human resources. Thanks to its automated operations it helps the



less downtime and reduced lifecycle costs,” says Sandheigl.

The operator can connect from everywhere to the cloud, even using mobile phones or other handheld devices.

“So you can walk in with your mobile and get immediate access to when the train passed the system and the results from the Predictor software. If one of the parameters is out of range, you can see it on whatever device you’re using, all from the one platform.” This feature is unique to NEXTSENSE, he adds.

Customer Benefits

So, where has CALIPRI X been implemented and what sorts of results have been achieved?

*“Vienna public transport operator, **Wiener Linien**, purchased nine of the automated systems – that’s a real success story,” says Sandheigl. “The customer operates Austria’s largest regional transportation service, ensuring that around two million passengers reach their destinations quickly, safely and comfortably every day. Safety, reliability and sustainability are paramount here.”*

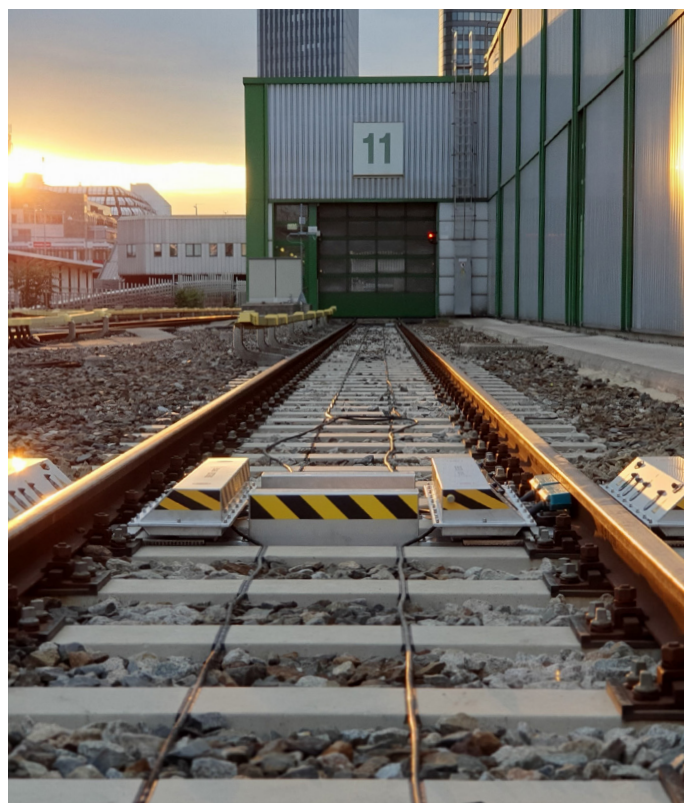
industry address challenges around maintenance costs and labour shortages.

“It’s always our intention to provide a high-quality product at an affordable price, which we firmly believe we’ve achieved with CALIPRI X, without compromises.”

Accessing the Data

A single pass over the system is sufficient to obtain both wheel parameters and wheel profiles. Measurements, which are taken using a laser light section method, are automatically stored in the cloud where the data can be analysed.

If a customer is already using a database or predictive maintenance software, NEXTSENSE can just hand over the data to the existing programmes. However, if a customer hasn’t got an analysis solution in place, *“we provide predictive maintenance software, **CALIPRI Predictor**, a cloud-based solution with annual licence fees. This enables users to safely operate their trains with longer, more predictable maintenance intervals,*



To ensure safe operation, all wheels are frequently measured to ensure that operating tolerances are adhered to. However, Wiener Linien was looking to improve the efficiency and reliability of this process, so the operator investigated the various options on the market to assess which one would enable it to increase the productivity of its maintenance operations.

“After a rigorous selection process, they chose the CALIPRI X automated on-track solution for precise train wheel profile measurement,” explains Sandheigl. “The data it generates is processed by Wiener Linien’s specially developed in-house software, which determines the ideal maintenance time and the necessary measures needed to achieve the longest possible wheel service life with the best possible workshop utilisation.”

Previously, Wiener Linien manually measured wheels, which was highly labour-intensive, time-consuming and less accurate. Using conventional mechanical gauges, it took around 2.5 hours to measure all 48 wheels on a subway train. In comparison, with CALIPRI X, all 48 wheel profiles are now determined in a single pass, with measurement data available in seconds.

Find Out More

To find out more about **CALIPRI X**, the **CALIPRI Predictor** or **NEXTSENSE** in general, please visit our **website** or contact one of the team via **sales.mi.nextsense@hexagon.com**.


NEXTSENSE

High availability, reliable results

- Independent from loads and vibrations**
 Calipri X is mounted on screw foundations with no direct contact to the rails. This ensures that different axle loads or vibrations won't influence the results.
- Ambient temperature under control**
 A chiller keeps the sensors' geometry, which directly influences the measurement results, at a constant temperature all year round. In addition, the beam structure connecting the sensor boxes is made of steel and the temperature measured, which enables the software algorithms to factor in any temperature drift.
- Copes with the environment**
 A smooth outline design ensures no sticking of leaves or dirt, while an air stream to all sensor windows keeps away dirt or rain automatically. For winter months, the Calipri X sensor boxes heat to melt ice and snow.
- Minimal maintenance needed**
 No moving parts ensure a high system availability; nothing can break or block.
- Measurement standards compliant**
 All dimensional results are calculated according to the EN15313 standard. The wheel profile alignment is done based on the profile, not relying on the wheelsets position above the system. All dimensional results are converted to a wheelset temperature of 20°C according to ISO-1 standard. This allows the comparison of the results and to analyse wear trends.

