

May 31, 2022

smart solutions  
for tomorrow

## Industry 4.0 for electric railways: AI solution enables intelligent maintenance management

***Böblingen, May 31, 2022*** - At LogiMAT in Stuttgart (May 31 to June 2, 2022), PENTANOVA CS GmbH will focus on a new system for predictive maintenance that uses artificial intelligence (AI) to avoid expensive system failures. The smart technology is visualised in Hall 1 at Stand K71 on a high-speed double-rail floor conveyor from the Böblingen-based company.

Electrified rail systems from PENTANOVA consist of a large number of mechanical and electronic components. After a certain amount of time, they all show signs of wear or their function can be impaired due to other external influences. In the worst case, this leads to unplanned system downtimes that cost the operator dearly. To prevent these scenarios, plant manufacturers and operators rely on reactive and defined periodic maintenance, which provides for certain functional tests or the replacement of parts after a certain period of time. However, PENTANOVA's new predictive maintenance system goes a decisive step further. Selected mechanical parts or components are continuously monitored by sensors. With the help of AI, this collected data can be used to make detailed forecasts about the failure behaviour. The plant operator receives precise and comprehensible diagnoses in real time, which enables preventive service strategies – with a positive effect on the functionality and service life of the plant.

### **Data collection and evaluation**

The basis of predictive maintenance is the continuous recording of a wide variety of parameters via state-of-the-art sensor technology within a previously defined range. For example, the current consumption of the drive motor or the acceleration profile of the drive can be recorded over the entire travel distance, as can the temperature curve inside the control box. The recorded data is graphically displayed in diagrams and continuously stored in the PENTANOVA Predictive Maintenance Cloud. This creates a large amount of data over time, also known as "big data".

In order to be able to evaluate the recorded data, a tolerance range is defined for each individual recording parameter. A variety of algorithms are used to continuously monitor and evaluate different amounts of data for a wide range of parameters, either directly or logically linked to each other, for possible deviations from the tolerance range ("big data analytics"). It is also determined when an alarm message is generated. The basis for this is, for example, the repeated exceeding of one or more tolerance limits within a certain period of time. In this way, an alarm message can be generated weeks before an actual component failure occurs and scheduled maintenance can be carried out outside of production time. Apart from this, the operator can view the status of his plant at any time, independent of location and in real time.

May 31, 2022

smart solutions  
for tomorrow**Increase in production through increased plant availability**

The AI solution from PENTANOVA can prevent production downtimes because maintenance operations can be planned in advance. For example, spare parts can be procured in good time, the stock of spare parts can be reduced or the deployment planning of maintenance staff can be simplified. In times of a shortage of skilled workers, this is a very important factor, as maintenance and on-call personnel are no longer permanently available and also no longer need to be trained in every last detail on the systems. All in all, the implementation of a smart system has a positive effect on system uptime and availability. The investment costs are quickly amortised through the planning reliability gained, higher plant availability and the reduced risk of failure.

The new AI solution from PENTANOVA can be retrofitted in new plants, but also in existing plants. For this purpose, the company plans to launch a retrofit package for upgrading existing plants on the market soon.

**Test facility for rapid operational readiness**

To further develop its new AI solution, PENTANOVA operates a test facility equipped with sensors at its Böblingen site that can simulate real faults and the wear and tear of material in conveyor technology. We took the initiative here because predictive maintenance is still in its infancy," says Sebastiano Sardo, CEO of PENTANOVA CS GmbH. "Currently, the entire industry lacks a sufficient amount of data that could be used for analysis, as there are not yet enough smart plants. With our test facility, we want to create a data basis that can be used to train machine learning models in the context of big data analytics. In this way, we offer our customers a future-oriented solution that is ready for use as quickly as possible," Sardo explains further. This project also convinced the state of Baden-Württemberg. As part of the "AI Innovation Competition Baden-Württemberg 2021", it is being funded under the name "Airtico".

\*\*\*

*With its high-quality, innovative products, technologies and services, PENTANOVA enables individual solutions for smart industrial processes. For 20 years, the system provider has been successful internationally and across all sectors in the areas of industrial automation, intralogistics and plant engineering and is now represented at 21 locations in eleven countries. Around 800 highly qualified employees worldwide ensure that every customer receives the right individual, component or complete solution to create efficient and flexible process flows. This is how PENTANOVA makes its customers fit for the future - smart solutions for tomorrow.*

*The Intralogistics division PENTANOVA Conveyor Systems plans, implements and supports customised complete solutions for a wide range of intralogistics sectors. The service portfolio also includes comprehensive technical consulting for the development of intralogistics solutions and the implementation of entire intralogistics systems as a general contractor. As a former business unit of the plant engineering company Eisenmann, the company division brings decades of experience in the planning, development and realisation of individual material flow projects, using its own*

May 31, 2022

smart solutions  
for tomorrow

*reliable, highly efficient and proven products. A wide range of service solutions is also available to customers after completion.*

**Bild**

*Intelligentes Instandhaltungsmanagement.jpg*

PENTANOVA's predictive maintenance and servicing system minimizes equipment failures with the help of artificial intelligence.

**Kontakt**

PENTANOVA CS GmbH

Marketing & Communications

Katrin Renz

Tübinger Str. 81

71032 Böblingen

Tel.: +49 7031 2098-109

E-Mail: [marketing@pentanova.com](mailto:marketing@pentanova.com)