



Systems & Components 2025: Predictive maintenance to prevent equipment failures

November 9 to 15, 2025 in Hanover - B2B marketplace as part of the world's leading trade fair Agritechnica – Leading theme “Touch Smart Efficiency” – Connectivity and automation in the off-highway sector - Maintenance meets artificial intelligence – Digital twins look further ahead

(DLG) Maximizing uptime—ensuring mobile machinery remains fully operational and available—is a top priority in the off-highway industry. This is a key topic at Systems & Components, which will take place at the Hanover Exhibition Grounds from November 9 to 15, 2025. Condition monitoring, remote diagnostics and predictive maintenance are among the key topics at the trade fair. On display at the trade fair in Germany are solutions that use intelligent sensors and data analysis to draw attention to faults early, enabling more efficient maintenance planning and optimization of the use of spare part inventories. The B2B platform is organized by the DLG (German Agricultural Society) and takes place as part of the world's leading trade fair for agricultural machinery, Agritechnica.

Off-highway machines are indispensable for heavy-duty tasks in the field or on the construction site. The harsh operating conditions require components that can withstand the highest loads. But sooner or later the point comes when wear eventually sets in. The in-cab operator, however, may notice the signs of wear too late. Because vehicle damage can lead to costly repairs and prolonged downtime, effective prevention is essential. The classic 'run-to-failure' approach of reactive maintenance reaches its limits here. At the exhibition grounds in Hanover, the focus is firmly on prevention.

“Detecting faults early and taking prompt maintenance action are key to efficiency—not just for farmers, but also for contractors and machinery manufacturers,” says Petra Kaiser, Brand Manager for Systems & Components, DLG. Predictive maintenance, the combination of modern sensor technology and real-time data analytics, utilizes algorithms to predict

potential failures based on current and historical data, helping to determine the optimal time for repairs on construction sites.

“Many of the companies exhibiting in Hanover are working intensively on solutions that leverage predictive maintenance strategies to identify mechanical, hydraulic and electronic faults before they lead to significant costs,” says Kaiser.

The total cost of ownership throughout a vehicle’s lifecycle is always a key consideration. Beyond customer benefits, the data collected through monitoring and diagnostic apps holds significant potential for engineering, sales, and service. For instance, machine designs can be optimized long before production using real load spectra and usage data.

Machine information in real time

Digitalization is a key driver in the development of predictive maintenance systems in the off-highway sector. Digital technologies make it possible to collect and analyze large amounts of information from various data sources along the entire drivetrain. Smart sensor technologies expand the available database, while high-performance telematics units with numerous interfaces can ensure secure data transmission in demanding application scenarios. The exhibitors at Systems & Components have taken on the challenges facing agriculture, forestry, construction and mining and are offering systems that promise maximum diagnostic reliability despite adverse conditions.

Sensors for use in harsh environments

Smart, integrated, and remote—these sensors are small tools with a big impact. In addition to their core function, measuring physical values, they also provide additional information. For example, algorithm-based sensors that deliver initial recommendations directly to the operator in the cab. These systems can operate autonomously even in environments without a data connection, such as mines. With these capabilities, maintenance needs can be predicted with high precision, making service planning easier and better aligned with inspection schedules. Recent innovations include electronic sensors for construction machinery that monitor the wear status of undercarriage track systems in real time—without the need for manual track link measurement.

Maintenance meets artificial intelligence

Once the groundwork under the hood is done — that is, a future-proof Telematic Control Unit (TCU) has been selected, the sensors and software for efficient data collection and transmission have been implemented, and device management is all set, including remote diagnostics and monitoring — predictive maintenance can begin. The next step is to process and visualize the data. Even if condition monitoring already uses sensor data to supervise the condition of machines: This condition-based maintenance only becomes truly predictive - in the sense of predictive maintenance - when artificial intelligence comes into play.

Digital twins look further ahead

As an international B2B meeting place, Systems & Components not only showcases the latest technologies, but also facilitates professional exchange and discussion of key future topics. Data-driven forecasting models of predictive maintenance are becoming increasingly important as also demonstrated by the expert presentations that will be held as part of the Expert Stage Systems & Components under the key theme of “Digital Services”. However, as these trends are extrapolated based on past events, there is a lack of data on failure scenarios that have not yet occurred.

The digital twin, a virtual replica of a mobile machine or its components, plays a pivotal role in predictive maintenance. By integrating real-time and historical data, it enables the simulation of potential failure scenarios, even those not previously encountered, allowing for proactive maintenance planning.

“The demands placed on mobile machinery in the agricultural, construction and mining industries are constantly increasing. Predictive maintenance makes it possible to achieve productivity increases that would otherwise be impossible,” concludes Kaiser. This will be demonstrated from November 9 to 15 at the trade fair grounds in Hanover, when the technology specialists for the automation and networking of mobile machinery present themselves at Systems & Components.

Current information about Agritechnica 2025:

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Media contact DLG:

Malene Conlong

Phone: +49 6924788237

Email: M.conlong@dlg.org

About DLG

With more than 31,000 farm and industry members, DLG is a politically independent and non-profit organisation. DLG draws on an international network of some 3,000 food and agricultural experts. DLG operates with subsidiaries in 10 countries and also organizes over 30 regional agricultural and livestock exhibitions worldwide. DLG's leading international exhibitions, EuroTier for livestock farming and Agritechnica for agricultural machinery, which are held every two years in Hanover, Germany, provide international impetus for the local trade fairs. Headquartered in Frankfurt, Germany, DLG conducts practical trials and tests to keep its members informed of the latest developments. DLG's sites include DLG's International Crop Production Centre, a 600-hectare test site in Bernburg-Strenzfeld, Germany and the DLG Test Centre, Europe's largest agricultural machinery test centre for Technology and Farm Inputs, located in Gross-Umstadt, Germany. DLG bridges the gap between theory and practice, as evidenced by more than 40 working groups of farmers, academics, agricultural equipment companies and organisations that continually compare advances in knowledge in specific areas such as irrigation and precision farming.

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