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Systems & Components 2025: Innovations driving transformation

9–15 November 2025 in Hanover, Germany – B2B marketplace at the world's leading agricultural machinery trade fair Agritechnica– Guiding theme: "Touch Smart Efficiency" – Intelligent technology for specializes industry requirements– Connected, automated, and efficient solutions

(DLG). Systems and components play a key role in the development of innovative and high-performance agricultural machinery. Under the guiding theme "Touch Smart Efficiency," the Systems & Components 2025 exhibition will present forward-looking technologies for agricultural and construction machinery, as well as related industries. A leading B2B platform and innovation hub for the international off-highway sector, the event will take place from 9 to 15 November 2025 in Hanover, Germany, as part of Agritechnica. The exhibition acts as a barometer of innovation for technological developments, offering a hands-on experience of the latest innovations and providing valuable impulses for industry, research, and practice.

The B2B platform for the agricultural machinery supply industry and the off-highway sector is shaped this year by the guiding theme "Touch Smart Efficiency," with a strong focus on transformation in agriculture — driven by digital intelligence and system integration. Modern electronics and AI-powered technologies enable intelligent, safe, and efficient autonomous machine control. Increasing attention is being given to NextGen Human-Machine Interface (HMI) systems, which enhance safety, comfort, and efficiency, while also making it easier for less experienced operators to get started.

A key focus area at Systems & Components is the latest sensor technologies — including 3D LiDAR, stereo cameras, ultrasound, and phased-array radar — which enable precise environmental sensing, depth control, and obstacle detection, even under extreme conditions. Another focus area is on advanced hydraulic systems that offer greater safety, flexibility, and environmental protection. Through innovative solutions, Systems & Components supports the trends and developments in agricultural machinery and the entire off-highway sector, demonstrating how perfectly coordinated components can deliver maximum precision and reliability.

AI Applications

Modern electronics and AI applications are revolutionizing agricultural machinery through the use of NextGen high-performance computers (HPCs), specifically developed for industrial and off-road machines. These computing platforms combine AI-based environmental perception with deterministic control logic, enabling intelligent, safe, and efficient autonomous machine operation.

By integrating real-time sensor data processing and adaptive decision-making into a compact system, autonomous processes are significantly enhanced. One example is a hardware-independent, AI-powered left-turn assistant for agricultural vehicles on rural roads, which improves traffic safety by detecting oncoming vehicles at speeds of up to 120 km/h and issuing a two-stage warning.

HMI (Human-Machine Interface)

Next-generation HMI systems rely on intelligent sensor technology and adaptive user guidance to significantly enhance safety, comfort, and efficiency. New sensors for joysticks and manual controls continuously detect operator presence and, thanks to programmable logic, reliably distinguish between intentional and unintentional inputs — without the need for calibration, and even when switching between gloved and bare hands.

In light of the skilled labor shortage, new intelligent vehicle platforms make it easier for less experienced operators to get started by integrating advanced image processing systems and flexible audio features. These systems support the driver in their tasks, improve safety, and enhance the cabin experience through targeted audio signals, which improve situational awareness while reducing cognitive load. Improved haptic feedback and operating quality are delivered by NextGen joysticks featuring integrated grip heating, presence detection, and vibrotactile response.

Assistance Systems for Mobile Machinery

Modern assistance systems have the potential to increase the level of automation in mobile working machines and provide intelligent support functions for operators. One innovative example is a collision avoidance system using AI and input from a 3D camera and can be used in both manned and autonomous machines. Another highlight is the MirrorEye camera-monitor system, developed specifically for the demanding conditions of off-road environments. It replaces or supplements conventional mirrors, enhances all-around visibility, and thereby improves both safety and efficiency.

Sensor systems

Modern sensor systems enable precise and reliable automation in agricultural operations and mobile machinery. 3D LiDAR sensors contribute to the safe automation of agricultural processes, while rugged stereo cameras offer high protection even under extreme conditions such as high-pressure and steam

cleaning, dust, and temperatures ranging from -30 to +70 °C. Ultrasonic sensors measure soil cultivation depth in real time, even under vegetation or crop residues, ensuring consistently high work quality. The sensor portfolio is complemented by phased-array radar systems, which deliver high-resolution 3D environmental detection even in fog, dust, dense vegetation, or darkness. With electronically controlled beam steering, these systems provide reliable depth control, precise obstacle detection, and support the autonomous operation of agricultural machinery even under challenging environmental conditions.

Cobots

Collaborative robots (cobots) are accelerating automation in agriculture, making it simpler and more accessible. Thanks to their lightweight design, ease of use, and relatively low cost, cobots offer a fast return on investment. Equipped with sensors and grippers, they are well-suited for agricultural applications such as fruit harvesting, sowing, and indoor farming.

Drive Technology and Components

A new software platform for power and motion control enables fast and flexible electrification of agricultural machinery. A modular, highly integrated electric axle system for tractors up to 100 kW combines traction, PTO, and hydraulics in a compact design, allowing for zero-emission operation at full performance. Key innovations include a dual electric drive system, energy recovery, and an optimized architecture for high efficiency and easy integration.

Electronic steering systems further enhance comfort and reduces operator fatigue. The integrated solution can optionally be upgraded to an “Automotive Steering Feel” platform for high-speed vehicles, featuring active haptic feedback and compliance with current cybersecurity regulations.
Additional components such as an ISOBUS- and AEF-certified tire inflation system with the fastest deflation capability, pressure and temperature monitoring, a compact pressure unit for centralized lubrication systems, and a NewGen boom height control system for sprayers further improve the efficiency, safety, and durability of modern agricultural machinery.

Hydraulics

In agricultural machinery, hydraulic systems are seeing advancements in key components such as engines, valves, filters, and fittings. Intelligent connection systems with integrated hydraulic functions ensure safe handling and easy operation, supported by reliable color coding. A digitalized solution enables condition monitoring and predictive maintenance of piston pumps, helping to reduce downtime. Automation modules specifically tailored to the needs of agricultural and construction machinery—such as for efficient operation at low speeds and high pressures—enhance operational flexibility.
Resource conservation and climate protection are supported by a new universal filter element that reduces the CO_2 footprint and avoids unnecessary costs through up to 30 percent lower differential pressure. In addition, leak-free systems make a valuable contribution to environmental protection.

Electrohydraulic drive components offer high power density in compact spaces and are also suitable for safety-critical applications such as steering.

Spare and Wear Parts

The area of spare and wear parts offers a wide range of innovative solutions. Among them is an AI-based app that identifies optimization potential and recommends the use of lubricant-free, environmentally friendly components to avoid harmful greases.

Conclusion

Systems & Components 2025 supports the latest trends and developments in agricultural technology and the broader off-highway sector through innovative solutions. Across all featured areas, the event showcases significant innovations—underscoring its role as a powerful testament to the industry's innovative strength in Germany and around the world.

Up-to-date information on System & Components 2025:

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About DLG

With more than 31,000 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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