Ansys

CASE STUDY /

Ansys + Mecalac

"SCADE supported the development of reliable embedded control software, reducing the possibility of software bugs that can lead to system malfunctions, ultimately reducing risk for both machines and machine operators."

"With help from SCADE, we completely achieved and even exceeded our objectives in both application code and software development."

Nicolas Kouznetzoff
Embedded Electronic Systems Expert / Mecalac

CASE STUDY

Ansys Supports Mecalac's Software Development Process Leading to Greater Operational Efficiency and Safety

Establishing industrial safety guidelines for the production and operation of heavy construction equipment is key in the prevention of human mishaps, including accidents, as well as damage to machines and materials during Mecalac's day-to-day operations. Mecalac used SCADE to support a more efficient software development process that increased code quality and ISO safety compliance, resulting in significant time savings while increasing overall operational efficiency.

Challenges

ISO 13849 outlines key safety requirements and provides guidance on the principles for the design and integration of the safety-related parts of Mecalac's control systems, including its control software design. The software enables safe machine operation, such as controlling the motion of an excavator arm. Motion sensors within an excavator arm, for example, provide feedback to the software, enabling closed-loop control. Software failure in this instance can cause the heavy arm to free fall or stop moving, halting industrial activity and risking non-compliance with ISO safety objectives.

Engineering Solution

For Mecalac, successful control software development demands extreme accuracy confined within a given programming language. No exception is possible — any error in the design of the software will lead to its malfunction. The goal of the Mecalac team was to generate a well-defined production code.

The team successfully used SCADE for the development of the control software guiding their construction machinery, including mechanical excavators and wheel loaders. SCADE is a software engineering tool based on a formal programming language that provides the accuracy and constraints Mecalac needed to reduce the risk of coding errors by their software engineers.

Benefits

- Using SCADE to address the safety critical part of Mecalac's entire control system ensured code reliability, and by extension, compliance to ISO 13849 safety standards and design guidelines.
- SCADE is particularly useful during software development, enabling quick debugging and faster development of different algorithms with quick edit and run cycles, as well as validation of various model components across design phases.
- Enabling verification and validation at the model level dramatically reduced the number of test cycles needed to deliver more accurate results.
- Ultimately SCADE helped Mecalac achieve an estimated 30-35% time savings in application development (during design – realization – test iterations), further boosting the company's bottom line.

Company Description

Mecalac is an international manufacturer of compact construction equipment for urban sites. Known for its innovative, customer-focused technology, Mecalac has sales companies, distributors and customers in more than 80 countries. Versatile and multi-purpose equipment is available through five product lines, including: excavators, loaders, backhoe loaders, site dumpers and compaction rollers. For more information Mecalac Group Services, 2 av. du Pré de Challes, Parc des Glaisins CS20130, Annecy-le-Vieux, FR-74941 Annecy Cedex; +33(0)4 50 64 01 63; www.mecalac.com; Facebook; LinkedIn; Instagram and YouTube.