Autec Meets EN ISO 13849-1 and EN IEC 62061 Standards with VectorCAST

Case Study - Autec s.r.l.

The Customer

Autec s.r.l., produces radio remote controls for industrial cranes, lifting machinery, logistics and construction. Since 1986, Autec has designed, manufactured and delivered wireless control systems specifically for safety applications. The company's radio remote controls are used in industrial overhead cranes, truck mounted and construction cranes, elevating work platforms for the lifting of material and personnel, construction and factory automation machines and systems.

The Challenge

In order to ensure safety and quality and obtain functional safety certifications, Autec must meet EN ISO 13849-1 and EN IEC 62061 (derived from EN IEC 61508) standards. To fulfill these requirements, Autec engineers must unit test complex code, including legacy code, and provide documented evidence regarding the coverage level achieved in testing.

The Solution

Following an extensive evaluation, Autec determined that Vector Software's VectorCAST embedded test solution could not only help them meet their software standards challenge, but also operates seamlessly with their preferred development suite. Because of the VectorCAST tool's ease-of-use and tight integration with their development platform, coupled with passing an exhaustive target and host testing evaluation, the Autec engineering team selected VectorCAST/C++ as their software test solution.

The Results

By employing VectorCAST, Autec engineers are able to reduce the time needed to test their designs, enabling them to gain greater productivity and higher levels of software quality. Autec is now able to rapidly deliver results in an easily comprehensible form for the validation and certification process.

Meeting Functional Safety Standards

The engineers at Autec face a unique challenge as they develop cutting-edge radio remote controls; while they do not manufacture the heavy equipment their devices are used in,

they literally "take control" over them. Typically used in hazardous operational environments, these wireless control systems must perform flawlessly in the field, because the risk to life, limb and sometimes lost profitability in their hands. In order to ensure that the embedded software used in the control systems is up to the task, they must meet tough EN ISO 13849-1 and EN IEC 62061 (a subset of EN IEC 61508) safety-critical standards.

To meet safety-critical software Verification and Validation, Autec needed an automated test solution that would integrate with their existing development environment, and provide proof that the C code passed stringent target and host tests. Autec engineers use their preferred development suite to develop the firmware used in the company's radio remote controls for industrial applications; complex embedded software applications are required to control this equipment as intended.

After conducting an initial web search for unit testing tools, Autec made a short list and began evaluating them. The team's goal was to gain confidence that the test tool could meet their requirement to document adherence to relevant standards, and show that VectorCAST could provide traceability to these standards.

Prior to using an automated testing tool, the team had a process by which they would perform unit testing on both the assembler and C code. The tests were built manually using the simulator included in the IAR Embedded Workbench development suite. While evaluating the tool, the Autec team approached Vector Software's support and made a request that was quickly sorted out by releasing an ad-interim version of the VectorCAST tool which offered useful features that helped meet their testing needs. Impressed by the fast start-up process, and rapid testing times, the team selected VectorCAST as their test environment.

Due to the quick ramp-up time, the rapid and responsive support services, the reduced testing time necessary, and the improved quality of the software, Autec is implementing VectorCAST as their standardized testing tool. Although the organization has only used the tool for a few months, management estimates that Autec has saved hundreds of man-hours in development time.