

Making use of the LDRA tool suite (software verification tools) in safety critical projects



The Client

Ultra Electronics Datel (Datel) is part of the Ultra Electronics Group and has been in business for over 25 years. Datel specialises in mission and safety critical software for Def Stan 00-55 / 00-56 & RTCA/DO-178B.

Datel also provides services in systems integration, consultancy and secure information management solutions.

The Projects

Ultra had 2 key projects which utilise LDRA:



- Wing Ice Protection System (WIPS) for the Boeing 787 Dreamliner, RTCA/DO-178B Level A



- The Engine Ice Protection System (EIPS) for the Pratt and Whitney F135 Engine on the Lightning II (Joint Strike Fighter) project.

Project Requirements

Datel had specific technical requirements including the ability to integrate with their target environment which included the Texas Instruments TMS320F2812 and TMS320F2808 DSPs. Datel made full use of LDRA's complete structural coverage analysis solution at Unit, Integration and System Test Levels. These tests were applied to both source and object code, making use of the red-box mode within the *LDRA tool suite*.

It was important to Datel that it was able to develop their software to a known coding standard and, consequently, MISRA-C:1998 was selected to be applied to this code. The simple process within the *LDRA tool suite* of enforcing various standards using drop down menus was very important for Datel.

Datel also needed an automated and intuitive unit testing tool which would save time, free up highly qualified staff, increase test efficiency and improve motivation to test through a repeatable, less error-prone process, which *TBrun* satisfied.

Savings of £2 million by using the LDRA tool suite

The Benefits



Tom Roberts, Engineering Manager, Embedded Software and Systems, commented:

“The reduction in manual effort included the automatic production of complex test harnesses and stub code by the unit testing tool, *TBrun*, which we would otherwise have had to write manually.”

“We found that the graphical user interface was easy to work with and made developing a rapid, intuitive test process a lot easier than creating it manually. This saving was further increased through the repeatability of tests utilising the automated regression testing facilities. This automated solution made our job a lot easier.”

“When we generated tests, they were more maintainable and easier to change than if we had produced them manually. We found that, from a coding perspective, the ability to consistently and accurately conform to standards and guidelines together with all the other features of the *LDRA tool suite* assisted in saving Datel £2 million over a 4-year period because of providing a highly streamlined and automated verification process.”

The Future

The *LDRA tool suite* has assisted Datel in dramatically reducing the time taken to confirm the verification results and has increased the repeatability of our process.

Datel can reuse information on other projects using the same tool chain, as well as having the ability to effectively modify and review alternative tool chains.

Tom Roberts commented:

“As the *LDRA tool suite* is able to easily jump between host and target testing on the click of a mouse, Datel will seek to use it on all future projects.”

To find out more about saving money and improving quality of service contact LDRA

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