

# TechTalks

Michael Geissel talks with Louie De Luna, Director of International Sales at ALDEC

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17. NOVEMBER

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eVision Systems  
Josef Ostermeier



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# About ALDECs dedication to the Aerospace market

Usually, we are visiting DAC every year to meet our partners and customers. Since most of our customers have decided to avoid international travel and some of our partners did decide to skip their participation because of the pandemic situation we had some virtual meetings instead. One off the latest talks that Michael had was a discussion about ALDECs DO254 flow with Louie De Luna, international Sales Manager at ALDEC.

**" The growing Electric Vertical Take-Off and Landing (eVTOL) aircraft market is very exciting. eVTOL would provide advanced air mobility at low cost, quiet operation and zero emissions. In Europe, it is projected that urban air mobility will become a reality by year 2025. "**

*As an EDA tool vendor, what is Aldec's role in the commercial aviation market?*

Majority of our business comes from the military/aerospace sector, and commercial aviation is a huge part of that. Our customers who develop avionics systems use our verification tools and solutions to design and verify their FPGAs installed on line replaceable units or circuit boards. For the majority of airborne electronic hardware, FPGAs have been the hardware technology of choice economically (as opposed to ASICs) when it comes to implementing functions that need high-performance and high reliability. Our customers develop FPGAs for various critical aircraft systems including engine control, landing gear control, navigation and guidance system, air data system, head up display and flight control data computer.

*What was the initial trigger for Aldec to offer solutions to assist with DO-254 compliance?*

Starting in 2005, when the FAA/EASA recognized DO-254/ED-80 as an acceptable design assurance guidance for FPGAs, we started to collaborate closely with our customers to determine what they need and how we can help. They needed new tool capabilities and solutions that can help them comply to the stringent verification process defined in DO-254. It was a natural progression for our company, and we stepped up to the challenge.

*What does Aldec provide to help with DO-254 compliance?*

We provide an end-to-end verification solution for FPGAs, starting from planning,

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requirements capture, conceptual design, detailed design, validation and verification. The solution includes training, DO-254 templates and checklists, HDL graphical entry tools, HDL simulation, code coverage, linting based on best-practice HDL coding standards, clock domain crossing (CDC) analysis, traceability and in-target physical test systems. Our tools provide the most benefit to FPGAs with design assurance level (DAL) A or B classification because of the required verification activities needed for compliance.

*What do you think is one of the critical issues in the verification process in the context of DO-254 compliance?*

For designs with DAL A or B classification, the most difficult aspect regarding FPGA verification is the importance of requirements-based testing in the target board. One of the main challenges is the inability to verify specific requirements by physical test because testing the FPGA device at the board level provides very low FPGA input control and output access points. This makes it difficult to inject certain signals for normal ranges tests and robustness tests, and as well as verify/capture the results at the pin level.

*How does Aldec help with this issue?*

Since 2007, we have been providing a fully customized hardware and software solution that would enable our customers verify 100% of FPGA-level requirements in the

target device using the HDL testbench as the test vectors. The HDL testbench typically verifies 100% of the FPGA-level requirements via simulations, and by using our solution, our customers are able to repeat the same test cases via physical tests in the target device. This helps them meet the verification objectives defined in DO-254. Our customers who have successfully used this solution and achieved certification include Thales and Elbit Display Systems.

*What is the most exciting opportunity for Aldec in the aviation market in the future?*

The growing Electric Vertical Take-Off and Landing (eVTOL) aircraft market is very exciting. eVTOL would provide advanced air mobility at low cost, quiet operation and zero emissions. In Europe, it is projected that urban air mobility will become a reality by year 2025. In 2020, EASA has already announced its proposed means of compliance for eVTOLs. There are over 200 types of eVTOL aircrafts currently in development and among them are developed by local German companies such as Lilium and Volocopter. The use of FPGAs and SoC FPGAs within eVTOL aircraft systems is also increasing because of their inherent re-programmability, high-performance and high-reliability. Safety will be of the highest priority in developing FPGAs, and those with DAL A or B classification will need advanced verification tools to ensure that the FPGA will function as intended under normal and abnormal operating conditions. This is extremely exciting for Aldec because we have been

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providing DO-254 tools and solutions for many years, and we have great expertise in verification of high-speed interfaces which are commonly used in today's SoC FPGAs. High-speed interfaces produce non-deterministic results and verification is a great challenge especially in the context of DO-254 and safety-critical systems.

*Thanks a lot Louie for your time and I am really looking forward to seeing you face to face on DAC 2022.*



*Louie De Luna*



*Michael Geissel*