

Diehl Aerospace Lifts Up Quality Testing Capacity With 2F-85 Adaptive Grippers and FT 300 Force Torque Sensor

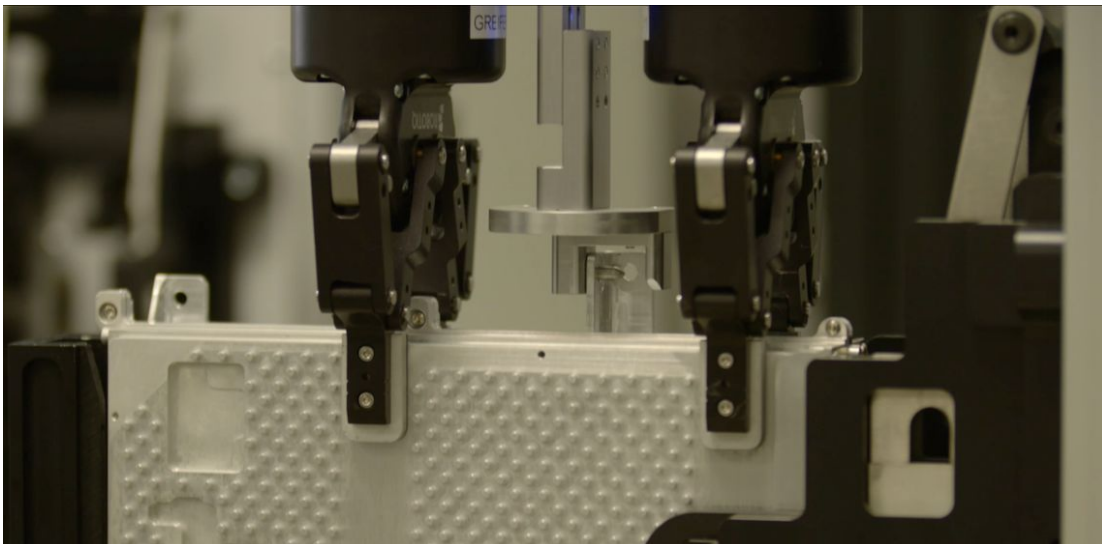
Diehl Aerospace manufactures computer systems for the Airbus A350 XWB. With orders for this aircraft in full swing, their quality testing department needed to increase capacity quickly. There was no need to implement a costly permanent night shift, because an automation solution—combining two [Robotiq 2F-85 Adaptive Grippers](#), a [Robotiq FT 300 Force Torque Sensor](#) and a [Universal Robot UR10](#)—provided a productive and flexible robotic cell.



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[The International Air Transport Association](#) estimates an average of 8% annual growth in global air traffic passenger demand since 2005. With this positive growth rate expected to continue until the year 2030, aircraft manufacturers are under pressure to deliver more of their best-selling units, faster. The city of Überlingen, in Southern Germany, is home to one of Diehl Aerospace's high-end factories, where computers and electronics for civil and military aircrafts are assembled with state-of-the-art technology.

Computer systems for the Airbus 350 XWB, referred to as the "aircraft's brains" by those who make it, need to go through a two-hour quality control process. To meet the increasing demand for these systems, Heiko Russ, head of industrial process engineering at Diehl Aerospace, faced a difficult choice: adding an expensive, permanent night shift to sustain the orders' pace, or delaying deliveries even more. "At first, we thought about using a traditional industrial automation solution. But after various visits to fairs and extensive research, we realized a collaborative robot would be the best option, since it's a lot more flexible and easy to use."



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“We realized a collaborative robot would be the best option, since it’s a lot more flexible and easy to use [than the industrial automation alternatives].”

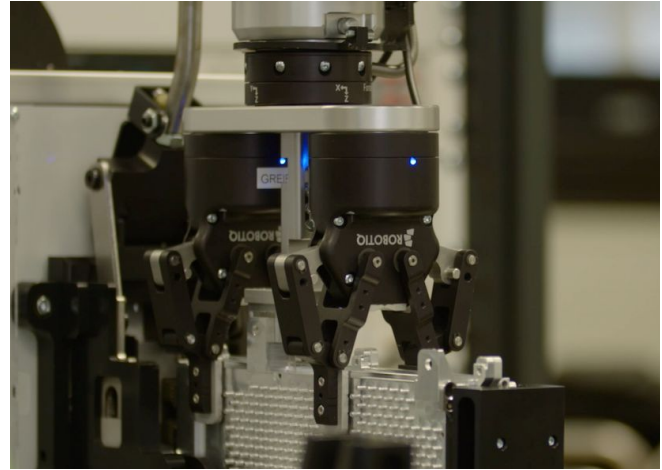
Automating Elaborate Testing Procedures

Every Diehl Aerospace computer on board an Airbus 350 XWB undergoes two hours of rigorous testing, during which every electrical interface, input, output, and sensor is double-checked. These tests are carried out by a machine, into which the computer is inserted. The staff of KPI Engineering, who helped Diehl Aerospace with the design, integration and operation of their project, recommended Robotiq and Universal Robots for the task of inserting the computer into the machine. “These computers are fragile and weigh 4 kg, with an asymmetric center of gravity,” says Marvin Plantius, CEO of KPI Engineering. “We were looking for equipment with adjustable force to avoid damaging the aluminum housing and electronics within. We also needed highly repeatable accuracy while sustaining a 4 kg payload.”

KPI chose a pair of Robotiq [2F-85 Adaptive Grippers](#) and a [FT 300 Force Torque Sensor](#) to handle the computer case. Plantius explains, “We needed a very flexible gripper with which we could easily monitor force and the distance between two points. The 2F-85 was an obvious choice. The big advantage of the force torque sensor is that you can record complex movements with the path-recording function. Force can be monitored for critical movements, such as when components come into contact with the parts trays.”

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Diehl Aerospace chose a Universal Robots UR10 for this first collaborative robotics project in their Überlingen factory. “It matched the environment really well,” says Plantius. “We wanted a cell design that takes very little space in an open area. We established a safety perimeter with sensors that slow down or stop the robot when a human is detected within a specific distance from the robot. This is a great alternative to caging, and it meets the highest safety standards. Plus, the components from Robotiq are [UR+](#) certified, which simplifies integration with Universal Robots. They are coordinated in terms of hardware and software, which allows us to operate the grippers and force sensor directly via the controller.”



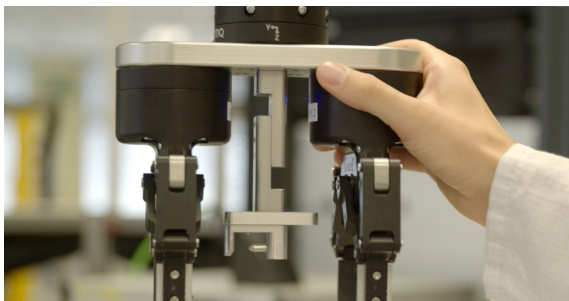
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Complex Application, Easy Programming

The whole quality testing application is controlled by a human-machine interface, independent from the Universal Robots teach pendant. The robot first receives the signal to tend a computer with both Robotiq [2F-85 Adaptive Grippers](#). The robot then takes the computer force barcode reading. The [Robotiq FT 300](#) helps position the computer for barcode reading. Once this operation is done, the computer is placed in the quality testing unit. The Grippers/FT 300 combo ensure the exact same positioning every time. The combo then closes the lever and the testing phase starts. The same process—apart from barcode reading—is carried out in reverse once the test is completed.

According to Daniel Frei, industrial production manager at Diehl Aerospace, although there are many steps for this single application, employees affected by the testing unit learned how to work with this new solution quickly. “In the beginning, two of our employees completed online training.



One of them attended the core training course at Universal Robots in Munich, which provided much more insight on the matter: How do I program the robot? How do I install every component? And so on. Afterward, they came back to Überlingen and taught five more people in the factory.”

Understanding and Appreciate Automation

Diehl Aerospace management quickly informed the whole staff that a robot was coming into the factory. “There were a few worries about job losses, but since this was a way to scale up and an addition to the team rather than a job threat, it soon came to be seen as good news in a growth context,” explains Heiko Russ. “It also meant the end of extra night and weekend shifts, which nobody enjoyed doing.”

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“We earned an ROI within a year by putting an end to night shifts once and for all with a reliable, mature and flexible solution. With the addition of excellent teamwork and communication, we’ve got everything we need to plan for the future.”

By adding capacity and reducing costs while maintaining the highest quality standards, Diehl Aerospace is now able to scale at the same speed as its customers. For Heiko Russ, this first project with collaborative robots also makes the company more attractive to potential clients seeking to work with partners who embrace the Industry 4.0 mindset. “We have paved the way for many more robotics projects. Our colleagues are looking at what we do and taking notes,” he says. “We now have a working group dedicated to robotics here. They are analyzing different arms for other heavier applications. As for our team, we’re actually thinking of replicating this quality testing robotic cell with our Airbus A320 computers.”



Looking back on this first project with Robotiq and Universal Robots, Head of Industrial Engineering Rolf Metzner easily recalls why this project was such a success. “We earned an ROI within a year by putting an end to night shifts once and for all with a reliable, mature and flexible solution. With the addition of excellent teamwork and communication, we’ve got everything we need to succeed.”

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Talk to an expert

About Robotiq

Robotiq's mission is to free human hands from repetitive tasks. Our tools and know-how simplify collaborative robot applications, so factories can start production faster. Robotiq works with a global network of connected robot experts supporting their local manufacturers.

Let's Keep in Touch

For any questions regarding robotics and automated handling or if you want to learn more about the benefits of using flexible electric handling tools, [contact us](#). And join us on social media!



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