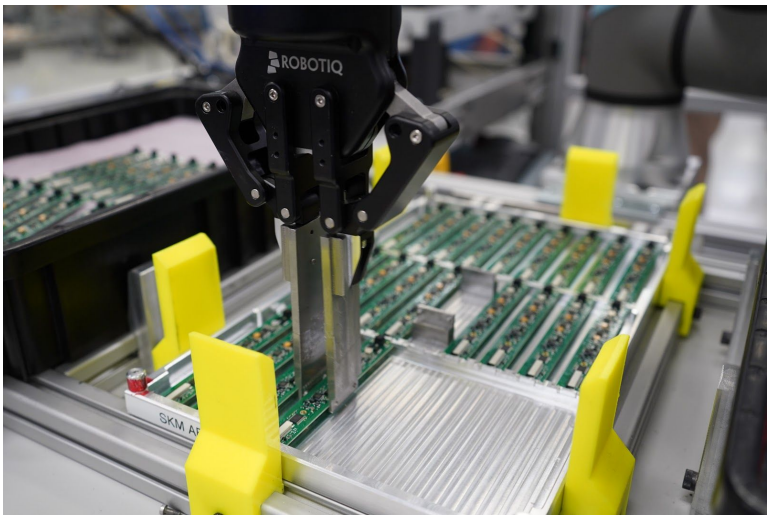
ROBOTIQ

SENNHEISER
The Pursuit of Perfect Sound

Increase Quality Testing Numbers by 33% with Robotiq 2F-85 and Insights

Sennheiser Manufacturing USA produces professional audio equipment for the Americas and Asia. Manual, meticulous testing of printed circuit boards (PCBs) became a bottleneck on the production floor. Sennheiser used Robotiq's 2F-85 Adaptive Gripper to handle 115 different PCBs and saw a 33% increase in the number of units tested. They also used Robotiq Insights to track daily production metrics, and the resulting data helped justify adding a second Universal Robots cobot the following year.

New Mexico is home to a diverse culture and a huge manufacturing sector. Government projects have attracted thousands of engineers and manufacturing workers to the Albuquerque region, and this large, talented workforce is what convinced German company Sennheiser to build its US facility there in the early 2000s.



Automate PCB testing

Sennheiser's factory assembles 30,000 PCBs—which go into 1,500 new professional audio devices—every week. The key to such high throughput? Automation. Since the factory opened, many automated industrial machines have been deployed to assemble millions of components into 115 different types of PCBs. However, until recently, the process of testing those PCBs was manual.

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“Robotiq had a unique solution: a reliable gripper that can manage part changeovers quickly, which was important for our high-mix, high-volume production.”

“At Sennheiser, we test everything 100%,” says manufacturing manager Steven Nery. “Typically you would have an operator putting a PCB in the tester and closing it. When testing is done, the operator removes it and puts in a new one—and repeats that for 8 hours.” As PCB production increased, testing became a bottleneck. In mid-2016, test engineer Roger Case looked into automating the task. “Robotiq had a unique solution: a reliable gripper that can manage part changeovers quickly, which was important for our high-mix, high-volume production. Plus, its wide stroke fit the form factor of the PCBs we were looking at.”

“I get daily reports of his tests and receive all alerts if the robot stops. So if there’s a problem, we’re able to attack it very quickly.”

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In a matter of weeks, Case and Nery—with help from a team of experienced manufacturing professionals at Sennheiser—automated a repetitive testing process with a Universal Robots UR5. Case described the application: “The robot picks the PCB up with its gripper, moves it to the scanner to validate the part ID, and places the part in the tester. That sends the tester a message to start testing. Once it’s done, the testing system sends a pass or fail message to the robot, which picks the part again and puts it in the appropriate pass or fail bin.”

Measure collaborative robot KPIs

When the first robot arrived at Sennheiser USA, it received a warm welcome. Every department, including HR, was closely involved from the start. They even held a contest to name for the robot, and decided on ART, for *Automated Robotic Team member*. “Since we always need to evaluate how new employees are performing,” Case recalls, “I told our managers we should do *the same for ART.”*

“I use Insights to communicate information to non-engineering people, because I can just point to the dashboard and explain what’s going on.”

Following that conversation, Nery began looking for cobot-specific monitoring tool to track the KPIs they needed to optimize production He connected the robot to the factory’s internet and paired it with the Robotiq Insights web application. “It has become a shop floor control tool. We have 3 different groups of people who use it for various reasons.”

For example, he continues “I use it to communicate information to non-engineering people, because I can just point to the dashboard and explain what’s going on. Roger [Case] likes to get daily reports of his tests and receive all alerts if the robot stops. So if there’s a problem, we’re able to attack it very quickly.”

“The cobots are fast, but I can keep up—and it’s great how much we’ve increased our numbers.”

Management also became interested in Insights. Case used the production data from ART to justify the purchase of ART 2: “With ART 1, we saw an increase of around 33% in the number of PCBs tested over a year, and the quality was higher because the handling was more consistent.” And with the new UR5e unit ART 2 now installed next to ART 1, the factory is aiming to double PCB testing capacities. “This is just the beginning,” says Case.

A new job with new colleagues

Anytime the robot has emptied all its trays, PCB testing operator Marcella Segovia receives a text message from Insights. Then she knows it’s time to load new trays. They’re often filled with another type of PCB, so she changes the robot program to let the gripper know which part to pick. “I was a little scared of the robots at first, but I really wanted to learn how to run them. They’re fast, but I can keep up—and it’s great how much we’ve increased our numbers. I sometimes joke that they’re my babies, but they’re more easygoing than real children, because as long as I feed them they never argue back!”

A grandmother of four, Segovia used to perform the repetitive manual PCB testing process. She now runs the robot’s testing operations, preparing trays for testing, prioritizing job orders, and programming the robot, without any prior expertise in this field. Segovia is enjoying her new role as a vital member of the team, working alongside robots at the center of the factory's evolution.

ROBOTIQ

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.


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