

# ADVANCED VISION TECHNOLOGY

## SUCCESS STORY

### PROOF OF CONCEPT ENSURES SUCCESS OF NEW AEROSTRUCTURE AUTOMATED ASSEMBLY PROCESS

#### From Manual to Automated Assembly

An aerospace customer wanted to introduce automation into the operation for present and future needs. The goal was to develop a standard platform using common programming that would also be flexible and scalable.

Automation had not been widely used in the organization which, due to the highly regulated industry, requires intensive operator training and certification. However, the difficulty in recruiting, training, certifying and retaining employees was one of the drivers for automation. Quality control was another as over time, operators tended to rely on memory rather than follow the guidelines provided at assembly stations.

#### The Automation Advantage

The product lines to be automated included processes ranging from installing fasteners to painting, but the common elements between them were low volume production, irregular shaped metal parts, and a lot of variation between installed components. This does not sound like an environment where automation would



*Installing nutplates*

typically be applied, but with advances in technology, automation is now a viable alternative for low volume, high precision assembly requiring 100% inspection, and continuous process monitoring.

Because the customer saw the introduction of automation as a long-term development program, they sought out a partner rather than an equipment supplier. SYSTEMATIX was a logical choice, because we not only have solid experience, but we are known for a customer-focused attitude.

#### The Proof of Concept Approach

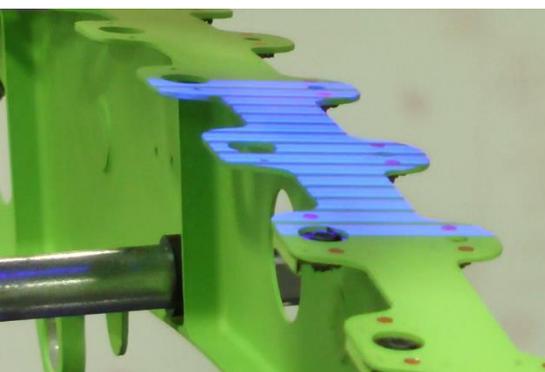
Our expert systems integrators quickly assessed the customer requirements and advised that with a tight cycle time and unproven process, a proof of concept project prior to building a full-scale production line would mitigate risk.

Proof of concept projects are typically planned around the process most likely to put the overall project at risk with the

purpose being to develop and test technology solutions. In this case, the ability of the vision guided robot to locate positions on irregular shaped parts within a short cycle time would determine the feasibility of moving forward.

***“Partnerships with leading edge technology suppliers allow us to offer best-in-class automation solutions to our customers.”***

**Rob Veldhuis** DIRECTOR OF SALES, SYSTEMATIX



*Locating installation holes*

To conduct the proof of concept, the most difficult product type was chosen for its irregular shape, number of parts, and complexity of processes. First, the SYSTEMATIX vision expert would develop and test the robot sequences for locating multiple nut plate installation points on a curved aerostructure part and once achieved, drilling and riveting tools would be added.

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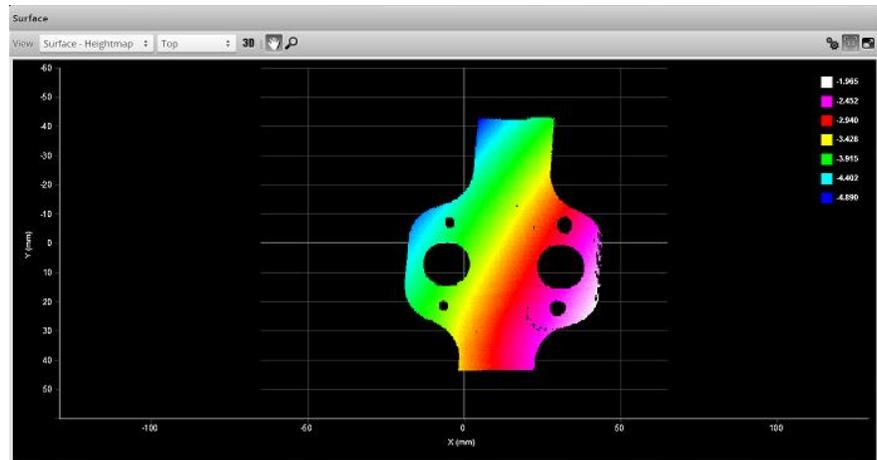
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#### The Technology Solution

Because 2D driven vision systems can only locate parts on a flat plane relative to the robot, the solution would have to be based on a 3D system. However, 3D systems require millions of data points for the smart sensor to “see” a part so the amount of processing time required to communicate the part position to the robot could be too slow to maintain the desired cycle time.

The customer selected Kawasaki robot technology because of its open architecture and ability to handle more advanced processes, but it was not known if it would be able to achieve the cycle time when paired with the 3D vision system. After analyzing available products, SYSTEMATIX vision experts settled on the Gocator® all-in one 3D smart snapshot sensor with Gocator Accelerator® software to connect the sensor to a PC for optimum processing speed. Although it is typically used in gauging operations for



part inspection, the Gocator product suite had many of the attributes needed for this application.

#### Exceeding Customer Expectations

Through the skill and perseverance of the SYSTEMATIX systems integrators, it was proven that the technology solution pairing the Kawasaki robot with the

Gocator sensor could meet the cycle time target of 39 seconds per nut plate installation. The full scale production line proceeded and the team was confident that the vision guided robot component would not stand in the way of achieving the customer’s production goals.

The customer was confident that the solution would serve them well for future needs with easy to use utilities for robot programming and making part changes directly to the PLC based interface.

#### Innovation to Serve You Better

We have a well-equipped lab for proving out vision inspection solutions. Send us your RFQ or product samples and our experts can recommend a solution that will work for you.



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