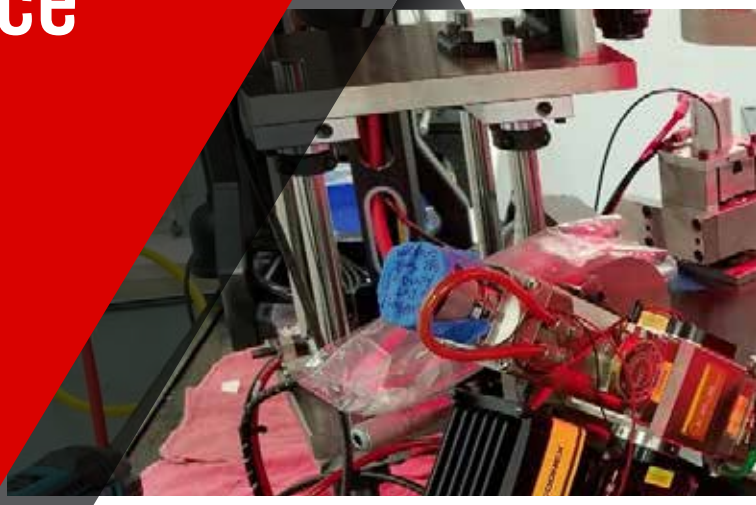
TRI-PHASE AUTOMATION

Engineering Excellence

SUCCESS STORY

Vision-Guided Precision for Medical Components



THE COMPANY

This metal stamping manufacturer specializes in producing precision components used in medical devices. Serving a highly regulated industry, the company prioritizes tight tolerances, consistent repeatability, and dependable quality control throughout its production processes. Their components play a critical role in medical applications, where accuracy, structural integrity, and traceability are essential. As production demands increased and quality expectations remained uncompromising, the company sought to enhance its automated capabilities to ensure every part met strict performance and inspection standards.

OVERVIEW

To support the manufacturing of medical device components, the company developed a custom rotary indexing table with multiple stations dedicated to assembly, inspection, testing, and packaging. The system required coordinated programming of vision systems, robotics, and motor controls to ensure smooth, synchronized operation. Tri-Phase Engineering programmed four cameras, two robots, and interfaced with multiple motors to create a cohesive, high-precision automated process capable of handling small stamped components reliably.

CHALLENGE

The rotary indexing machine needed to coordinate multiple functions within a continuous, multi-station process. Small components had to be accurately identified, picked, and placed into pneumatic grippers, inspected for weld quality, pull tested for structural integrity, and transferred into finished goods packaging. Synchronizing four cameras, two robotic platforms, and motor-driven indexing required precise timing and dependable communication. The system had to maintain consistent cycle times while ensuring accuracy at every stage to meet demanding medical manufacturing standards.

SOLUTION

Tri-Phase Engineering programmed and coordinated the automation system to ensure reliable performance across all stations of the rotary table. The goal was to create a seamless flow of motion, inspection, and testing while maintaining precise control over each stage of the process. Key elements included:

Machine Vision Programming

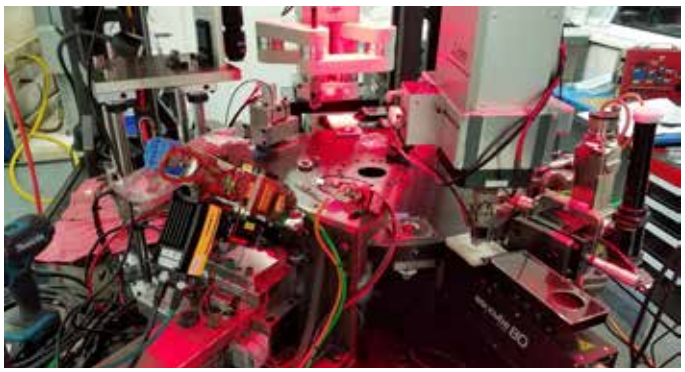
Configured four cameras to guide robotic pick-and-place operations and inspect weld quality throughout the process. Vision feedback ensured small components were correctly identified, positioned, and verified before advancing to the next station.

Robotic Programming

Programmed a Micro robot to accurately pick and place small stamped components into pneumatic grippers that securely hold the part once released. A SCARA robot was programmed to perform pull testing at a designated station, verifying part integrity before placing finished components into final packaging.

Motor Coordination & Indexing Control:

Interfaced with and programmed the machine's motor controls to maintain precise rotary indexing, synchronized station timing, and repeatable cycle performance across the entire system.



RESULTS & OUTCOMES

The completed system delivered a dependable, repeatable automated process built to support the demands of medical device component manufacturing. Each stage – from part handling to inspection and final packaging – now operates with synchronized accuracy and consistent performance. By combining machine vision programming, robotic control, and coordinated motion sequencing, Tri-Phase Engineering helped the manufacturer strengthen process reliability, reinforce quality assurance, and maintain the precision required for medical device component production.

ACCURATE PART HANDLING

Vision-guided robotics ensured precise identification and placement of small stamped components, reducing the risk of misalignment or handling errors.

IN-PROCESS QUALITY INSPECTION

Automated weld inspection provided immediate verification during production, helping identify defects early and maintain high quality standards.

VERIFIED STRUCTURAL INTEGRITY

The programmed pull test confirmed part strength before packaging, adding an additional layer of quality assurance within the production cycle.

STREAMLINED PACKAGING & FLOW

Automated transfer into finished goods packaging reduced manual intervention, improved throughput consistency, and supported stable cycle times across stations.

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