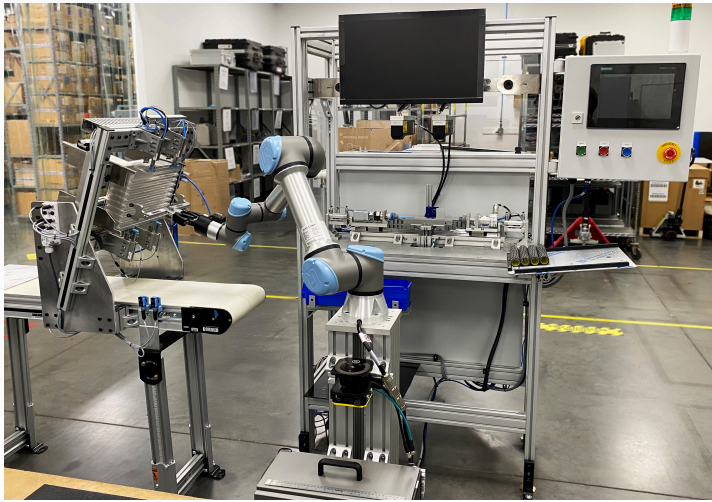


AUTOMATED ROLLER VERIFICATION IN AUTOMOTIVE MANUFACTURING



Customer Success Story

The Challenge

An automotive manufacturer in North Carolina needed a reliable way to verify that all rollers were present inside bearing tubes before advancing parts downstream.

Manual inspection created variability and risk. Missed defects could lead to assembly disruption and costly rework. The customer required an automated system capable of accurate detection, repeatable performance, and flexible changeover between multiple bearing types.

The Engineering Approach

TAG Solutions was asked to evaluate the feasibility and integration requirements of an automated roller verification system.

System review and layout analysis revealed:



Manual inspection introduced variability and risk of missed rollers.



Reliable detection required precise 3D positioning and coordinated decision logic.



Part flow and tray handling needed structured control to maintain consistent cycle time.

Layout drafts and integration planning ensured feasibility before fabrication.

The Solution

TAG Solutions engineered and commissioned a fully integrated robotic inspection cell designed to verify roller presence before downstream assembly.

The system combines collaborative robotic handling, dual 3D inspection sensors, centralized PLC control, and automated tray management into a coordinated architecture.

Each tube is picked, inspected, evaluated, and sorted within a deterministic control structure that eliminates ambiguity in quality decisions.

The result is a disciplined automation cell built for repeatable performance and simplified operator interaction.

Results

-  **Inspection Confidence Restored**
Automated 3D verification ensures incomplete assemblies are detected before advancing downstream.
-  **Throughput Stability Maintained**
Cycle time performance engineered to avoid production bottlenecks.
-  **Reduced Manual Dependence**
Quality decisions are data-driven rather than operator-dependent.
-  **Operational Flexibility Increased**
Multi-part capability supports evolving production demands.



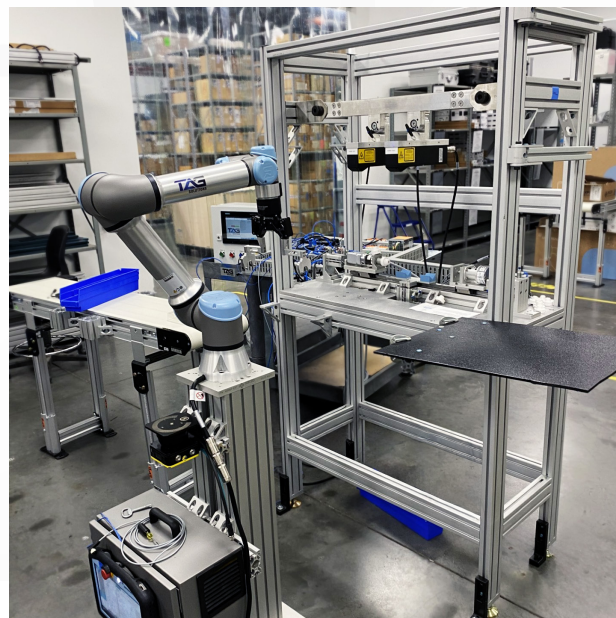
Scan to view the full project story and additional system images.

Integration & Control Architecture

System architecture was designed to ensure:

- Deterministic communication between robot, vision system, and PLC
- Clear pass/fail decision logic with traceable inspection results
- Structured part flow and reject handling
- Simplified changeover between bearing types

By treating robotics, vision, and controls as one unified system, TAG Solutions reduced integration risk and improved long-term serviceability.



Key Takeaways

By integrating robotics, vision, and controls into one coordinated system, TAG Solutions delivered reliable defect detection without sacrificing throughput.

The result is improved inspection confidence, reduced operational risk, and a scalable foundation for future production needs.