# LASER MARK AND PART QUALITY GAGE SYSTEM

CHALLENGE

Automotive supplier specializing in powder metal required end of line solution to serialize and gage parts to ensure quality. The goal of this project is to develop a system that can accurately and efficiently handle the processing of four different part numbers, each with varying geometry, when presented to the system in random orientations. Some parts may need to be flipped over in order to properly align them with the system's requirements. Additionally, each part has a unique laser marking position and data requirement that must be met, and each part must also be placed on a gage for inspection. The system must be able to correctly identify and process each part, correctly orient it, apply the correct laser markings, and place it on the correct gage for inspection, all while maintaining a high level of efficiency and accuracy.
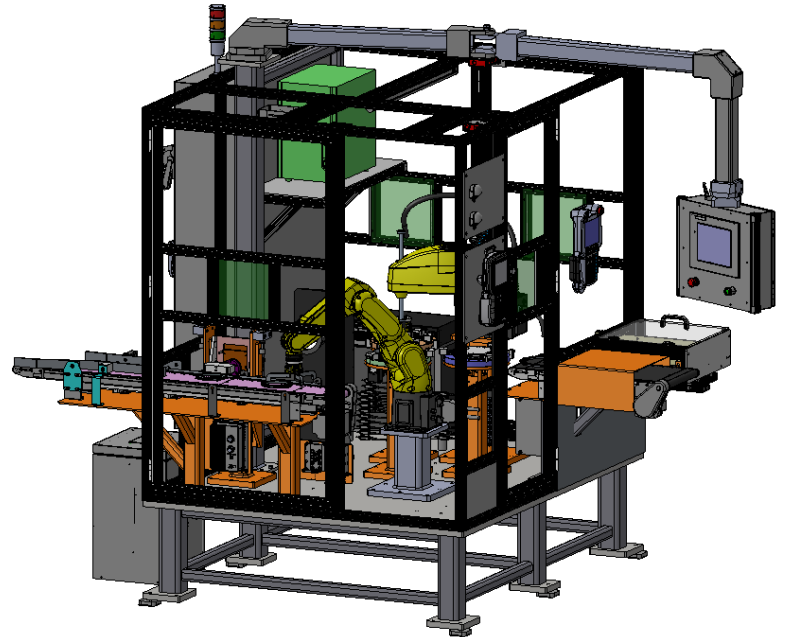
SOLUTION

Working closely with the customer, Even Automation designed a system utilizing several different industrial technologies to complete the project.

Utilizing a touch screen HMI, the operator would select the part type to be run. Product would then be conveyed into a cell where a pneumatic device would pick the parts up and flip them over if required. Parts not needing flipped would simply pass through the device.

At the end of the conveyor a Fanuc LR Mate 6-axis robot utilizes Fanuc iRvision guidance to locate the pick the part the same way every time. The robot then presents the part to a Keyence laser marker where text and data matrix was applied and verified by vision system, graded to applicable ANSI standard.

QUICK FACTS

Industry: Automotive, Powder metal

Technology: Conveyance, Material handling, Vision guided robotics, Laser marking, Bar code reading, Custom Gage

Cycle Time: 8 parts/min (7.5 sec/part)

Part Variation: 4 different PNs

Gaging Tolerances: 0.120mm using high precision LVDT touch probes

After grading, the robot loads the piece onto a part number specific gage where LVDT (Linear Variable Differential Transformer) touch probes, up to 9 on a single part, are utilized to send precise measurements back to the PLC where software calculates diameter and roundness and compares to customer specification.

NOTE: Operators can load master parts onto gages to check accuracy and calibrate probe measurements from the machine HMI.

After a determination is made on the quality of the part another robot, a 4-axis Fanuc SCARA, picks the part and places it on reject or outbound conveyors.

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OUTCOME

During runoff at Even Automation, we were able to demonstrate good Gage R&R results (<10%) using Statistical Process Control (SPC) methodology.

The end user is able to guarantee part quality on high impact dimensional characteristics because they are measuring 100% of the product. They also have reduced scrap by providing quick feedback on previous operations so that adjustments can be made.
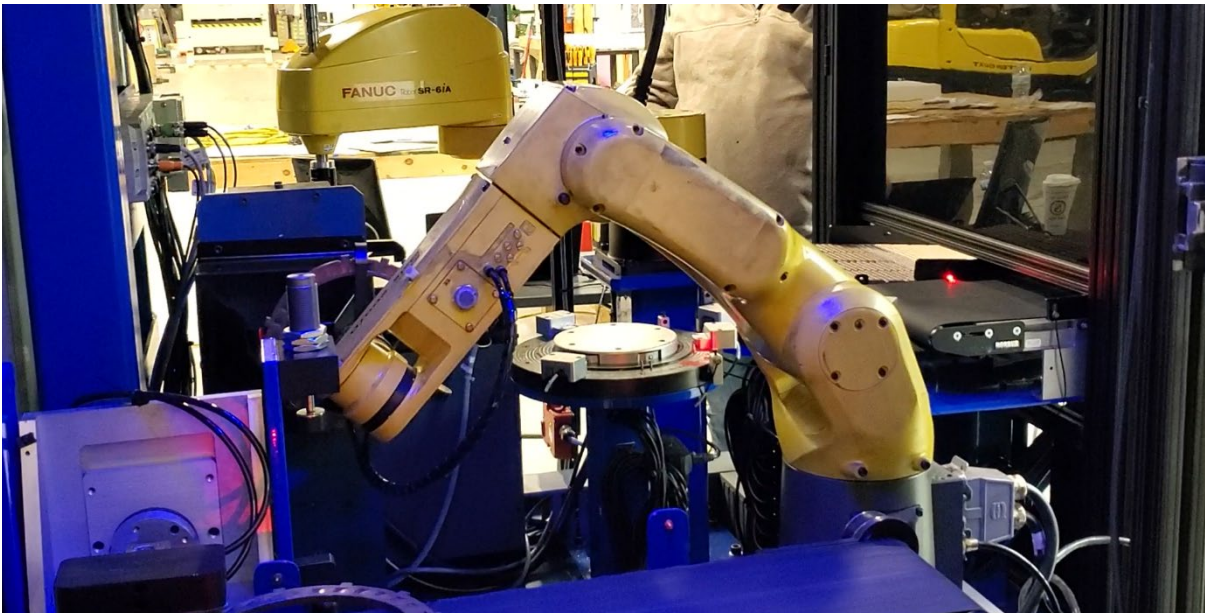
6-axis robot presenting part to laser marker after picking from conveyor

4-axis robot picking part from one of the gages