



COGNEX

Cimtec's Automated Inspection Solution Increases Quality Control

A worldwide manufacturer of components for the motor vehicle industry needed an upgrade to their automated part inspection system. The company supplies drive train systems and components, including axles and drivelines, braking systems, suspension systems, and ride control products for medium- and heavy-duty trucks, trailers and specialty vehicles. The company also supplies body systems (roof and door systems), chassis systems (suspension systems, suspension modules and ride control products) and wheel products for passenger cars, all-terrain vehicles, light trucks and sport utility vehicles.

In order to maintain a high level of part quality, the company contracted with Cimtec to develop a high-speed vision-based inspection system to inspect parts and identify material or manufacturing defects before the parts exit the manufacturing line.

Cimtec's Inspection Solution

Cimtec's system was designed to automate the inspection of both cast and stamped parts by scanning the part, measuring key features, and providing the data on the measured parameters directly to the iGear Server on the company's network via Ethernet. The system components include:

- Barcode scanner to identify individual parts
- Spider Vision Station PLC
- Cognex Insight 5403 Camera with PatMax and accessories
- VisionView for operator viewing of camera inspection
- Backlight (13" x 13").

A conveyor system delivers the part into the inspection zone, and a backlight mounted beneath the conveyor highlights the features of the part. The system uses the barcode scanner to identify the part and to initiate the system to look up the parameters of the part scanned in the iGear database. Based on the identification of the part, the server loads the correct program into the camera and performs the inspection. The measured features include:

- Pilot hole diameter
- Number of mounting holes present
- Position and clocking of mounting holes (angular and X/Y coordinates)
- Number of ABS holes
- Position and clocking of ABS holes
- Diameter of ABS holes
- Position, clocking and size of slots

Cognex Cameras

The Cognex camera is the centerpiece of the solution Cimtec designed for this company. Cognex is a world leader in image acquisition and processing hardware and software, and supplies a line of cameras suited for the rugged environment of a manufacturing production line. For this application, the Cognex Insight 5403 camera was selected. The Insight 5403 camera is a rugged high-resolution option with one of the fastest image acquisition speeds that Cognex cameras can provide. Cognex's image processing software can identify, measure, and report on all of the critical features of each part quickly and accurately independent of part position and orientation.

Inspection Operation

The sequence of operation for the inspection system developed by Cimtec begins with scanning a barcode on each part. On each barcode scan, the systems looks up parameters linked to the specific product type as identified by the bar code. iGear loads the correct inspection job to the camera, and a trigger from iGear directs the camera to perform a vision inspection. After the vision inspection has been completed, the

measured values will be input into the iGear database as data points. The scanned image is also displayed on a monitor for operators to review the images.

iGear then automatically compares the measured features to the stored parameters to determine if the part passes or fails the inspection. This inspection system allows for tolerances of ± 0.008 " to be obtained with a 13.75" x 10" field of view. The inspection cycle from start to finish for each part is about 30 seconds. The system then directs the conveyor to move the part to specified locations, depending on whether it passed or failed the inspection.

Cimtec's automated inspection solution allows the company to reduce inspection times and increase inspection accuracy through the combination of quality imaging hardware by Cognex and the iGear data storage system.