



**EMP**  
TECHNICAL  
GROUP

## Circuit Board Inspection System

**Challenge:** Perform a number of quality inspections on a variety of circuit boards.

**Solution:** Custom conveyor and reject station, light beam trigger sensor, vision station with 12MP GigE color camera, vision software, control panel, Windows PC, and E-stop circuit.

**Story:** A circuit board manufacturer produces a number of different circuit boards for the HVAC industry. Each circuit board has a number of components that are manually placed. These components have been known to go missing somewhere in the manufacturing/shipping process. The customer was looking for a way to inspect each circuit board after the components have all been placed and before the product ships to their end customer.



This is a complex application, but the vision engineers at EMP were up to the task. Each circuit board is placed on a conveyor and sent through to the vision inspection. A 12 MegaPixel GigE color camera, along with the vision software, performs a number of inspections to identify each manually placed component:

locate, color inspection, orientation, missing screws, diameter measurement, barcode inspection, etc...



Because of the circuit board variety, the team at EMP knew right away that a custom program that would allow the user to select which board they were running would be needed. This program is visually displayed on an HMI that is powered by a Windows PC. It allows the user to select the job they want to run as well as program any new jobs that may arise.

The 12MP camera with the custom vision program performs the visual inspection. If the board does not pass, it is sent to the reject conveyor to be re-worked. Every inspection, whether good or bad, is stored to the customer's database. This information can then be referenced whenever a complaint is made on missing components. This database has already saved the circuit board manufacturer costly fines by proving a component was present during the manufacturing process.

Do you have a complex vision application that you are looking to tackle? Don't hesitate to reach out to the vision engineers at EMP today!