Case Study J5504-002.docx

Genesis Case Study #: J5504-002  
Application: Robotic Lathe Tending  
Market Segment: Automation / Agricultural  
Product: Drive Train Components  
Cycletime: 2 - 8 Minutes  

Summary  
A Genesis single-robot workcell tends an Okuma MacTurn 550 multi-function lathe and operates “lights out”. The “Lean” system is designed to run either large or small batch sizes as required by daily production. Drive train components are manually loaded onto two inbound conveyors per the schedule displayed on the Operator display panel. The parts travel down the conveyor and into the robot zone, and once detected, a Fanuc R2000iB robot initiates its cycle and scans the two conveyors using a robot-mounted Fanuc iRVision/2D vision package to identify the part model, part location and orientation. The robot confirms the correct part is loaded and picks it from the conveyor using the offset data from the vision package. The robot enters the Okuma MacTurn 550 lathe and unloads a finished part and loads a new part. The part is then re-gripped (if necessary) and taken to a part marker station, where a part number, chuck number, and 2D barcode are applied. The part is then placed onto an outbound conveyor, which returns the part to the operator for offload.

Project Challenges  
- The system was to be capable of handling up to 100 part models with minimal changeover and minimal programming.  
- Robot gripper must be able pick up randomly-placed incoming parts with an OD gripper.  
- The conveyor must be durable yet provide a proper background for robot vision.  
- The system must allow for in-process manual quality inspection.  
- The system must be able to communicate with the existing plant production software.  
- Uptime of 95%.

Genesis Solution  
- Single-robot workcell with a Fanuc R2000iB/165F robot equipped with Fanuc iRVision/2D  
- Two inbound, 120” x 24” powered conveyor systems with no hard tooling  
- Genesis part marker station with Telesis marker  
- Dual 3-jaw grippers with quick-change jaws and Genesis camera enclosure  
- Allen Bradley PLC Controls with 10” Color Panelview Plus Operator Interface (HMI) with access to programmable part database for creating parts  
- Two-nest re-grip station, inspection drawer with “vision-friendly” surface and locking capability  
- Integration with customer-supplied Okuma Macturn 550 lathe and plant network