Robotics and Glass:

Changing The Way We Move
Who We Are

What is Industrial Automation?
Who We Are
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Industrial Automation

- PLC Automation
- Software/Motion
- Drives
- Motor Automation

ROBOTICS
Robotics and Moving Glass

Challenge:
Glass Manufacturer experienced high rejection rate while moving glass side windows from one process to the next.

Scenarios Further Defined:
Glass side-windows needed to be unloaded from a conveyor onto a plastic rack and unloaded from a plastic rack onto a conveyor.
Robotics and Moving Glass

Key Factors:
Rejection rate: 6-8 pieces per hour
Primary Cause: glass-to-glass contact
Secondary Cause: manual error

Initial Key Constraints:
Glass placement on exit conveyor was random
Racks were inconsistent
Robotics and Moving Glass

Objective:
Integrate a robot into the existing plant processes to eliminate glass-to-glass contact, increase productivity and promote safety.
Meeting the Objectives – Loading the Racks

Eliminating Glass-to-Glass Contact:
1. Make the Robot “See” the Rack and the Glass using laser sensors
2. Teach the Robot to decipher the number of slots, defects and positioning
3. Program the robot to execute motion for pick and placement without glass-to-glass contact

Considerations:
1. End of arm tooling
2. Getting “reach” and range of motion
Meeting the Objectives – Loading the Racks

Increasing Productivity:
1. Process data from laser sensors effectively and quickly
2. Convert data to motion cues
3. Increase speed of armature movement to match conveyor output

Considerations:
1. The right I/O module – Trial and Error
2. Matching speed of data with speed of motion
Meeting the Objectives – Loading the Racks

Promote Safety:
1. Eliminate broken glass
2. Establish mechanical safety perimeter
3. Design and build light curtains to allow human interaction

Considerations:
1. Human interactions for moving racks and maintenance
Outcomes

Objective: Eliminate Glass-to-Glass Contact
  Outcome: Defects went from 6-8 rejections per hour to ZERO

Objective: Increase Productivity
  Outcome: Cycle time is currently faster than line can deliver glass

Objective: Promote Safety
  Outcome: Zero injuries since installation