Abstract

Pinnacle Foods Group of Fayetteville Arkansas, henceforth PFG, asked us to design and implement a system to detect and reject an exception occurring on one of their assembly lines. After a series of meetings, a concept design was conceived and pursued.

Introduction

PFG utilizes 5 lines to process a variety of different products. A recurring issue in a number of these lines, is a tray denester malfunction, wherein the denester will miss a tray placement. That eventually causes a plastic tail to be appended to an adjacent tray further causing devastating effects further down the line. when the trays are sealed. Herein lies the issue.

Problem

Essentially, the root issue is the denester malfunction. When trays with tails travel down the line, they snag on various bits of machinery that can cause a myriad of other problems all of which result in expensive down time. However, due to design constraints, the main issue to be rectified is the problem caused by trays with plastic tails. In that endeavor, our work area is condensed to the region from the exit of the plastic cutter to the entrance of the X-ray machine.

Solution

Therefore, we propose a solution to identify the problem trays and reject them. We will need to be able to identify when a missing tray event has occurred, as well as to reject those trays as required when they reach the ejecting zone.

Design

In order to achieve that solution, we plan to use:
1. MicroLogix™ 1100 PLC
2. Diffuse and Through Beam Photo Switches
3. Solenoid Valve/Blower Assembly

We will program the PLC to detect missed trays via the photo switches, and then reject the trays into the ejection zone once they reach that point of the working area.