PEARSON
PACKAGING SYSTEMS

An Efficient and Flexible Robotic Palletizing Solution

Project Overview

This fruit-based food manufacturer and co-packer struggled to keep up with increasing product demand, operating an outdated palletizer that could only stack boxes at rates of 7 cases per minute. They needed a replacement solution that could double their throughput and also handle various types of pallets and cases (both close- and open-top), and form a variety of pallet stack patterns.

With limited and ever-changing personnel overseeing the machine, adjustments would need to be quick and simple to execute - even for inexperienced operators.

Customer Objectives

Double throughput rates

Current palletizing rates of 7 cases per minute would need to increase to 16 cases per minute in order to meet their order commitments.

Multi-case pick and continuous motion ensure that the desired rates could be met.

The robot's tooling is sized to pick up to 10 cases at once, releasing a complete row or placing a portion of it's load before rotating and placing more cases, depending on the selected recipe. As cases enter the cell, a side transfer re-directs them on-the-fly, while a mechanical pusher forms the proper pick pattern.

To further speed up the process and eliminate waiting times, an automatic pallet dispenser releases a new pallet while the completed pallet exits the cell.

Flexibility to accommodate different pallet and case styles, and form various stack patterns

Using both wood and iGPS pallets, the manufacturer needed a flexible way to automate the pallet dispensing process.

And, the solution would need to be designed to handle both Regular Slotted Containers (RSCs) & Half Slotted Containers HSCs), and also able to stack the cases in different patterns.

The automatic pallet dispenser is flexibly sized to house and release the various pallet types needed.

To accommodate the regular and open-top cases, a fork-style end-of-arm tool with grippers is used to cradle cases from the bottom while plates gently apply pressure on the top securing the load while the robot is in motion. Once the cases are in the proper position for placement on the pallet stack, the forks retract and release them.

All currently used stack patterns are pre-programmed into the HMI. Switching between patterns can be easily done with the push of a touchscreen button.

Intuitive recipe changes with minimal downtime

On account of limited staffing and frequent operator turnover, run adjustments would have to be simple and quick to execute, with minimal impact to production.

Since the end-of-arm tool was designed for versatility, manual adjustments are not necessary to run different case types or sizes. To change over to a different recipe, the operator simply selects the desired recipe from a pre-programmed list. To make changes to existing recipes or create new ones, the machine's Pallet Configuration Tool supports and simplifies the process with easy-to-understand screens to input new case dimensions or stack count selections.

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Sequence of Operation:

The bottom-most pallet is dispensed from the pallet magazine (1) onto the pallet conveyor (2). Slip sheets are picked from the slip sheet magazine (3) and placed on the pallet. Boxes enter on a zoned zero-backpressure accumulation conveyor (4), then shift 90 degrees at the case transfer station (5) to arrive width-leading at the palletizer (6). Cases are counted into the pick zone, the transferred onto the fixed pick station for robotic picking.

A custom end-of-arm fork tool is designed to pick multiple cases at once (pick quantity is dependent on the recipe selected), then place them in the appropriate orientaiton on the pallet build station (7).Complete pallets are transferred out of the cell through the safety light curtain to a fork truck-accessible pickup station (8).

1 Pallet magazine/dispenser

2 Pallet conveyor

3 Slip sheet magazine

4 Accumulation conveyor

5 Case transfer

6 Pearson RPC-MX robotic palletizer

7 Pallet build station

8 Pallet pickup station