

Palletizing Solution

Mixed Case Palletizing with Random Order Palletizing Software

Basic Description

FANUC Robotics has been in the palletizing business for more than 20 years. We have more than 1,000 palletizing robots in the field today. Our latest technologies allow us to perform the most challenging of all palletizing tasks, Random Order Palletizing (U.S. Patent). This leading edge technology has been in use since 2000 and in its fourth major release (Gen IV).

Overview

Random Order Palletizing (ROP)
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- ROP combines products of various sizes and weights on a single pallet
- Two modes of operation are supported;
 - Random Order Palletizing (Stack randomly delivered product)
 - Random Order w/Buffers (Pick from 2-8 randomly delivered products)
- ROP Benefits;
 - The ability to palletize cases that become out of sequence
 - Produces dense loads. Note: Denser loads are produced if the cell is configured with buffers
 - Stable/conveyable pallets (Pallet stability is controlled)

FANUC Robotics' Random Order Palletizing, the Solution for -

Mixed case sizes that are delivered randomly to the robot where pre-sequencing of cases to a preferred optimized pallet solution is either not possible or the pre-sequence breaks down (missing cases). The use of customer supplied buffer positions to obtain more choices for the robot to pick from can allow for a better palletized solution.



Technical Description

The software algorithm is the key for any random order mixed load palletizing application. The current patented algorithm that FANUC Robotics uses was developed at our Rochester Hills facility. The algorithm was the result of a collaborative effort between our product development and Automation Systems Group.

A standalone high-speed decision-maker is at the heart of the algorithm. It monitors the case(s) on the input conveyor and determines which case should be picked next and where it should go on the pallet. It uses a series of "rules" to make this decision. It analyzes 20 different aspects of case placement before determining the optimum destination for each.

The algorithm has a series of strategies that it uses to make decisions. Additional decision points can be added to meet unique customer palletizing requirements. The cornerstone of the algorithm is to build stable pallets. This is accomplished by analyzing the stability of each case before it is placed to insure that it meets the project requirements.

Benefits

- Algorithm decision making process can be easily modified
- Uses a 'best score' feature to place "difficult" packages
- Algorithm supports a virtual mode (offline)
- Packaged with a graphical operator interface
- The only Industry-Wide algorithm that incorporates pallet stability
- A single PC can support multiple palletizing robots (customer supplied or as optional accessory)

Robot Models

Random Order Palletizing can be installed on many FANUC robots including:

- FANUC M-410i/B Series
- FANUC R-2000i/B Series
- FANUC M-900i/A Series

Currently featured on the FANUC M-410i/B/160 robot

Included in Packaged Solution

- FANUC Robot Model as Selected
- Random Order Palletizing Software (U.S. Patent)
- Cabling Dress For robot arm only
- EOAT with Servo motors and cables
 - Single Case Top Vacuum EOAT available
 - Single Case Side-Gripping 1-Axis Servo EOAT available
 - Single Case Universal Case Handling EOAT available
 - Other Custom EOAT's available upon request
- Assembly of all components
- Custom Gripper Control Software macros
- Custom Random Order Palletizing Teach Pendant Screens
- Aux Axis Configuration
- Tested and Ready for System Integration
- ROBOGUIDE® Basic Cell; configured with 3D model.(provided after order placement for workcell development).

Options Priced Separately

- Custom Software for Peripheral equipment interfacing
- Work Cell peripherals (i.e., Robot Risers, Safety Fencing, Interface Panels, etc...)
- ROBOGUIDE® Software
- Mixed Case Palletizing (MCP) Plug-in Software (Interface to 3rd Party Pallet Optimization Software)
- Workcell MCP PC Station



Random Order Palletizing with Available EOAT Options



Vacuum EOAT



Single Side-Gripping EOAT



Universal Case Handling EOAT

Intelligent Robot Solutions



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