

# Palletizing Solution

Mixed Case Palletizing - Suite  
*With Real-time Processing Option*

## Basic Description

Mixed Case Palletizing (MCP) involves combining products of various sizes and weights on a single pallet. Automating this process presents a number of significant challenges.

Pallets typically contain a large variety of case sizes and their placement is influenced by a variety of factors.

Some of these factors are:

- ✓ The contents of each case
- ✓ Case structural integrity
- ✓ Case delivery sequence
- ✓ Customer "rules"

The Automation Systems Group's (ASG) new MCP Suite offers customers a full set of tools to address the many challenges.

## Overview

ASG's MCP Suite includes the following functions.

- Multiple algorithms supported (ASG & 3<sup>rd</sup> party). Select the best one for your application!
- Full function graphical HMI for monitoring and reports
- Standard interfaces for the cell PLC, robot and host
- Standard gripper routines for each MCP supported gripper
- Virtual processing capability with ROBOGUIDE®

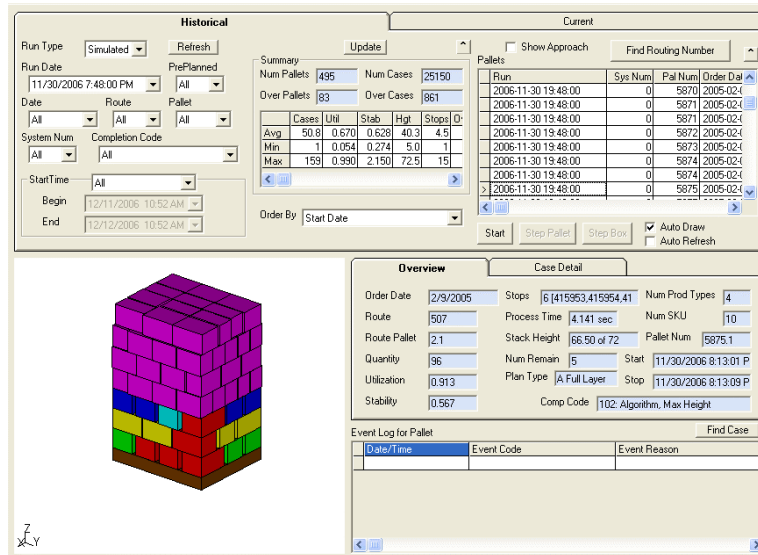
Supports two palletizing modes:

### Preplanned (ASG & 3<sup>rd</sup> party)

- Build is preprocessed
- Little cycletime impact
- High density pallets
- Higher load stability

### Real-time (ASG)

- Route and pallet planning
- Build-time processing
- Random delivery support
- Automated recoveries
- Robotic sorting w/buffers



## MCP Suite Benefits

ASG's Mixed Case Palletizing Suite combines the best tools available in the market into one package. It offers the higher densities of industry's best 3<sup>rd</sup> party algorithms and the flexibility of ASG's own Real-time algorithm.

Combined with the best robots and end of arm tooling available, ASG's MCP Suite is the right answer!

Some of the unique benefits of this package are:

- Automatic recoveries (for out of sequence deliveries and missing products) eliminate repair lanes
- Up front virtual processing with ROBOGUIDE® validates throughput and pallet build quality before equipment is purchased
- Standard I/O interfaces reduce integration and startup costs
- TTP template programs simplify programming efforts
- ASG or 3<sup>rd</sup> party algorithm post processing including:
  - ✓ Validates robot reach
  - ✓ Validates pallet integrity
  - ✓ Integrates EOAT limitations
  - ✓ Calculates approach and retreat vectors
  - ✓ Determines case delivery sequence

## Technical Description

The power of the palletizing algorithm is the key to any mixed case palletizing application. Our real-time algorithm can operate as either the primary decision-maker or as a backup to a preplanned algorithm.

ASG's patented real-time algorithm was developed at our Rochester Hills facility. It is the result of a collaborative effort between our Product Development and Automation Systems Groups.

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 be placed on the pallet.

The algorithm uses a series of "rules" to make this decision. It analyzes 20 different aspects of case placement before determining the optimum destination for each.

Rules address items like: Interlocking cases, checking supported area and maintaining reverse drop sequencing. Additional rules can be added to meet unique customer needs.

The cornerstone of our real-time algorithm is its ability 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's requirements.

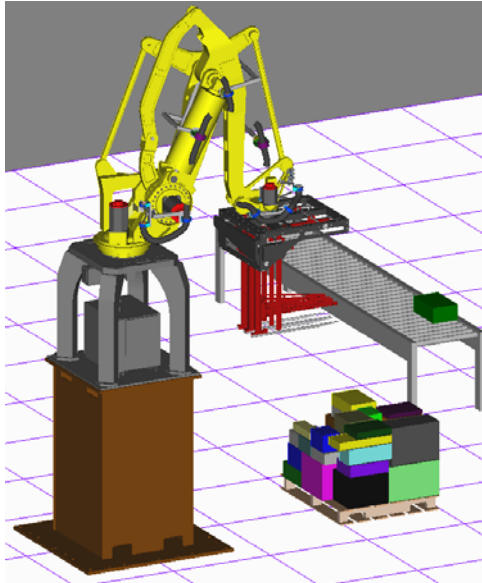
## Included in the Packaged Solution

- Selected FANUC Robot Model
- Mixed Case Palletizing Suite with Real-time Algorithm (U.S. Patent)
- Standard Gripper Control Routines
- Mixed Case Palletizing Teach Pendant Screens
- Selected EOAT with Servo motors and cables
  - Single Case Top Vacuum EOAT available
  - Single Case Side Paddle EOAT available
  - Single Case Universal Case EOAT available
- Assembly of all mechanical components
- Dressout for Robot arm only
- Auxiliary Axis Configuration
- Tested and Ready for System Integration

## Options Priced Separately

- ROBOGUIDE® Software
- ROBOGUIDE® Basic Cell configured with 3D model
- Custom Host Interface Software
- Custom Route and Pallet Planning Software
- Custom Peripheral Equipment Interfacing
- Mixed Case Palletizing PC
- Custom EOATs available upon request
- Workcell peripherals (i.e., Robot Risers, Safety Fencing, Interface Panels, etc...)
- Additional (new) 3<sup>rd</sup> Party Algorithm Support

*Note: All 3<sup>rd</sup> Party algorithms must be validated by and purchased from the supplier.*



MCP Suite running with ROBOGUIDE



Mixed Case Palletizing with Paddle Gripper



Vacuum Gripper



Paddle Gripper



Universal Case Gripper

## Intelligent Robot Solutions

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