Basic Description

FANUC Robotics provides two software packages that help save time and expense for the development and integration of robotic palletizing and depalletizing systems. PalletPRO simulation software can be used to completely build, debug and test a palletizing application off-line. The data created in PalletPRO can then be downloaded to a real robot controller containing the PalletTool software.

PalletPRO allows users to create a work cell layout with any FANUC robot, infeed and pallet stations, slip sheet and pallet dispensers. It also allows creation of hundreds of unitloads using PalletPRO’s built-in library of industry standard patterns and to visualize them in 3-D. PalletPRO supports multi-case vacuum, bag and fork grippers. The user can also simulate case rates on each of the infeed conveyors.

The PalletTool software on the Controller has many features that are designed for ease of running production with a PLC and to assist the operator with daily tasks. The end-of-batch function allows the PLC to send product changeover data to the Controller. The partial pallet startup and part drop recovery features allow the operators to resume production and easily recover from part drop errors. Password protection is also available.

Benefits

- With PalletPRO, validation of palletizing and depalletizing processes can be accomplished in a virtual environment without the time consuming and costly need for an actual robot or associated peripherals like infeed case conveyors, outfeed pallet conveyors, pallet dispensers, slip sheet dispensers or grippers.

- PalletPRO improves productivity by allowing users to easily build, test and debug their palletizing systems off-line. This reduces time, cost and effort during work cell integration. This also qualifies projects and palletizing applications quicker and more accurately than through common manual methods.

- PalletPRO allows for off-line “what-if” scenarios for palletizing and depalletizing simulations like case rate on conveyors, pick and place delay factors of different grippers, pallet indexing and slip sheet handling.

- PalletPRO provides highly accurate reach verification, collision detection and system throughput (cases/minute) validation. The system throughput data obtained for PalletPRO is the most accurate for FANUC robots compared to any other simulation package, since it is based upon a virtual robot using robot-specific system parameters.

- For the operator, PalletPRO is easy to learn, operate and maintain. For the integrator, it is easy to integrate with PLC and customize the palletizing sequences.

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Features

- **Process navigator** – A fully-integrated environment with a graphical user interface that quickly teaches new and experienced palletizing operators how to set up and simulate a palletizing work cell.

- **FANUC robot library** – Quick access to any floor-mounted, four- and six-axis FANUC robot for system layout and simulation.

- **Built-in CAD models** – Instant access to commonly-used palletizing system peripherals like infeed conveyors, pallets, slip sheet dispensers, pallet dispensers and vacuum grippers. This allows quick setup for different configurations, such as one infeed-one outfeed, two infeed-two outfeed, etc.

- **CAD import (IGES files)** – CAD models of existing fixtures, obstacles (fencing, light curtain etc.) and customer-designed grippers can be imported directly into PalletPRO to build system layouts and evaluate system operations.

- **Unitload Setup** – Allows users to add new unitloads in the palletizing work cell and to edit existing unitloads. It also includes a built-in library of industry standard patterns including user-defined patterns, configuration of normal and flipped layers, optimal path for palletizing sequences and slip sheet placement between layers.

- **Pallet and Slipsheet picking** – PalletPRO allows creation of pallet and slipsheet dispensers in the work cell. With this feature, the robot will always pick up a pallet from the pallet dispenser before palletizing cases or bags on it. It will also pick a slipsheet from the slipsheet dispenser and place it on the pallet or on each layer as configured in the unitload properties. This allows for accurate accountability for the overall cycle time and throughout.
I Robot Reach check – A 3-D view of the robot work envelope is provided to instantly verify that infeed conveyors, pallets and other cell components are well within the reach of the robot.

I Case and bag palletizing – PalletPRO provides visualization and optimization features that are unique to both case and bag palletizing. It contains a built-in bag gripper and features that allow overlap of bags. The 3-D world in PalletPRO supports display of both bags and cases.

I Mixed layer palletizing – PalletTool and PalletTool Turbo allow combining of different unitloads into a mixed layer unitload. A mixed layer unitload can have a different SKU or stacking pattern for each layer.

I Collision Detection – Visually identifies collision during robot simulation and helps relocate the robot, tooling and/or conveyors before installation in the plant.

I Animation AVI – Allows users to record the simulation of the palletizing operation.

I Measurement units – Dimensions are specified in both Metric (mm) and English (in) units.

I Download and upload – The palletizing simulation allows downloading of the unitload, infeed pallet and other data to real robots over either Ethernet or a Serial RS-232 connection. If downloaded data is changed, the Upload function (in PalletPRO versions 6.40 and later) can be used to import the data back into PalletPRO, keeping simulation and real world production operations identical.
Gripper Types

Flexibility:
- Supports vacuum, fork, bag and custom grippers, with independent case control for up to six cases.
- Palletizes/depalletizes empty/full or partially full pallets.
- Supports multiple pallets and infeed conveyors per robot.
- Provides various part drop recovery options.
- Supports automatic end-of-batch and pallet indexing.
- Defining gripper I/Os.

Throughput:
- Provides capability to perform line-balancing using the Pallet Switch feature. The choices are switch infeed per pick, per layer and per unitload.
- Allows users to place cases on multiple layers in one cycle.
- Allows users to specify case quantity and orientation per cycle.

PalletPRO PC Requirements

- Microsoft Windows 2000
- Intel Pentium™ III processor 800 MHz or higher
- 256 MB RAM
- 500 MB hard disk space

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