APPLICATION-FIRST AUTOMATION:

How to Succeed with Palletizing

eBook
Published June 2022

on robot

Workpiece

Environment

System requirements

Collaborative Automation Starts with Your Unique Application Needs

These days, workers are in short supply and product demand is high. That means you can't afford to miss customer deliveries simply because you can't staff repetitive, unergonomic tasks like palletizing.

Palletizing using collaborative or light industrial robots provides fast return on investment (ROI) even for small and midsized manufacturers and logistics organizations. It's cost-effective, quick to deploy, and offers the flexibility needed for high-mix, low-volume environments and peaks in demand. You get better consistency and higher productivity without overtime or injuries. And with automated palletizing

you can depend on, you can focus on staffing more desirable, higher-value positions for workers to help you grow your business.

The challenge is to find the right palletizing system that meets your unique business needs, now and into the future. That means technology choices shouldn't drive your decisions. Instead, your application needs should guide you to the best solution. This application-first approach is the key to successfully deploying your automated palletizing system quickly, reliably, and cost-effectively.

Anatomy of a Collaborative Palletizing System

While collaborative palletizing systems can be configured in many ways, a typical system includes most or all of these elements:

- Infeed conveyor with sensors to detect the presence of boxes
- Collaborative or light industrial 6-axis robot
- Lift (7th axis) to extend robot reach
- Vacuum or finger gripper with ability to handle slip sheets
- Slip sheet stack fixture with sensor to detect slip sheet presence
- Pallet fixture with sensors to detect pallet presence
- Programming and monitoring software to integrate and manage entire system

Palletizers are often deployed by a system integrator, but if the palletizer system elements you choose are designed to work together, deployment will be simpler, faster, and less expensive. And you have the option of redeploying and managing the system on your own, even without extensive robotics experience.

Workpiece Requirements

Your application decision starts with the size, shape, weight, and type of containers, boxes, or other packaging that you need your palletizer to handle. It's also important to think about workpiece changes that may occur in the future to make sure your palletizing system can keep up with your business as it evolves and grows.

The other critical workpiece decision is the type and size of pallet and palletizing pattern. This may also change over time as your business evolves or as customer requirements change, making flexibility and configurability key elements for success.

Euro containers
(Plastic KLT boxes)

Closed cardboard boxes

Packs of bottles

Lidless and open boxes,
shelf-ready products

Workpiece Considerations

Payload

Size and weight of boxes or packages influences robot and gripper specifications, but can also have an impact on worker safety. Heavy boxes may not meet risk-assessment guidelines for collaborative applications, so the system may require additional safety features.

Variability

Variability in size can also affect your choice of robot, and whether you can use the same gripper for multiple sizes of boxes or if you'll need multiple grippers to meet different applications.

Porosity

Lighter-weight cardboard can be less expensive but is also more porous. Vacuum grippers vary widely in their ability to successfully grip porous cardboard, so check specifications.

Shape

The shape or material of the box affects the best way to grip them. Traditional closed boxes are ideal for vacuum grippers, while open containers, plastic KLT boxes, and other types of packages may be more appropriate for finger grippers.

Multiple workpieces

You may get higher overall output if you can move multiple boxes at once. A powerful and customizable vacuum gripper offers additional flexibility for this option.

Slip sheet

If your application requires slip sheets, look for a gripper that can handle both boxes and slip sheets, and with automated programming to make this step seamless.

Environment Requirements

Your collaborative palletizing system should be flexible enough to fit into your existing floor plan and production workflows with minimal disruption. Early palletizing systems typically offered limited configuration for placement of the robot and pallets in front of the infeed system, but new advancements offer more flexibility.

The OnRobot Palletizer offers multiple layout options to match workflow needs and fit into existing palletizing workcells.

One Pallet

Two Pallet

One Pallet
with Slip Sheet

Two Pallet
with Slip Sheet
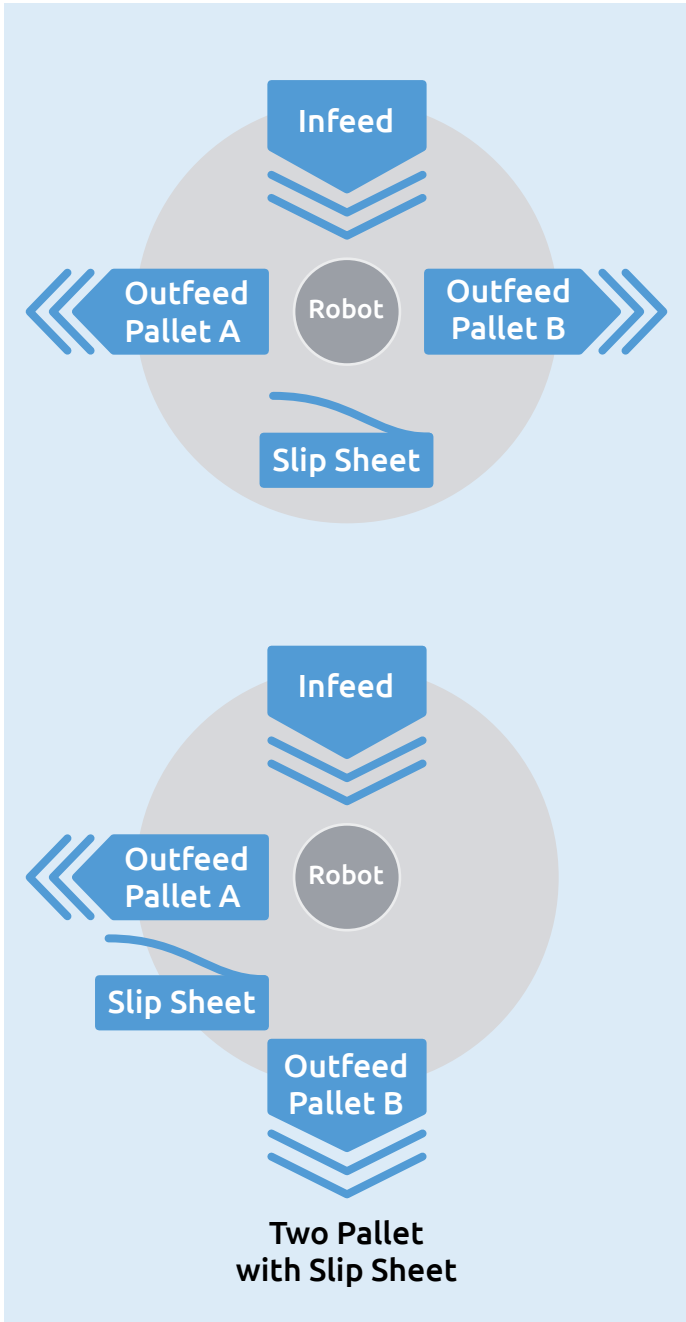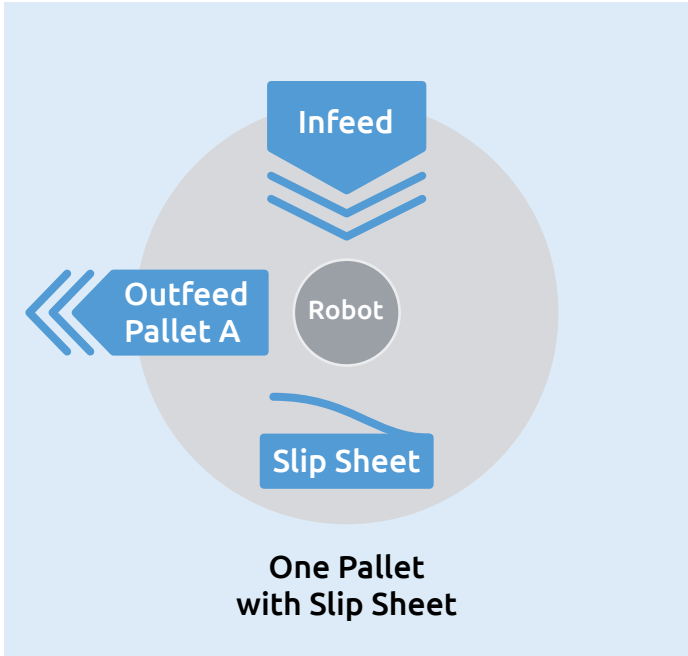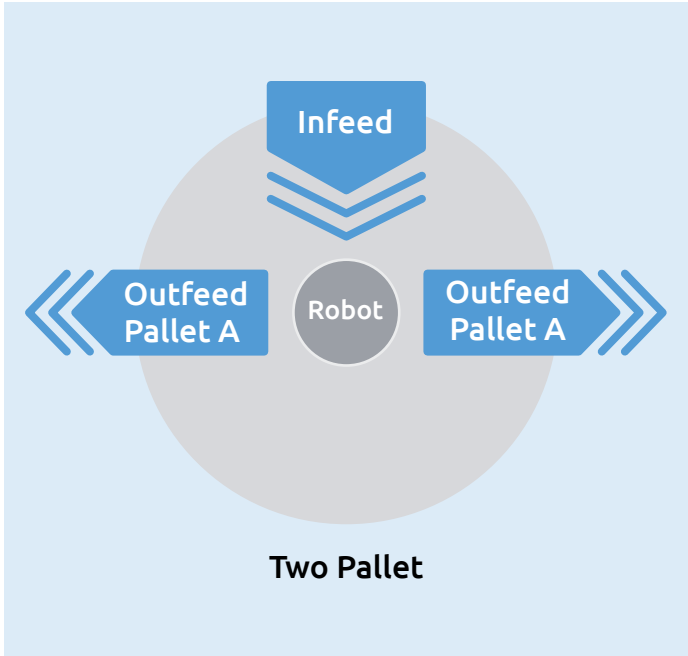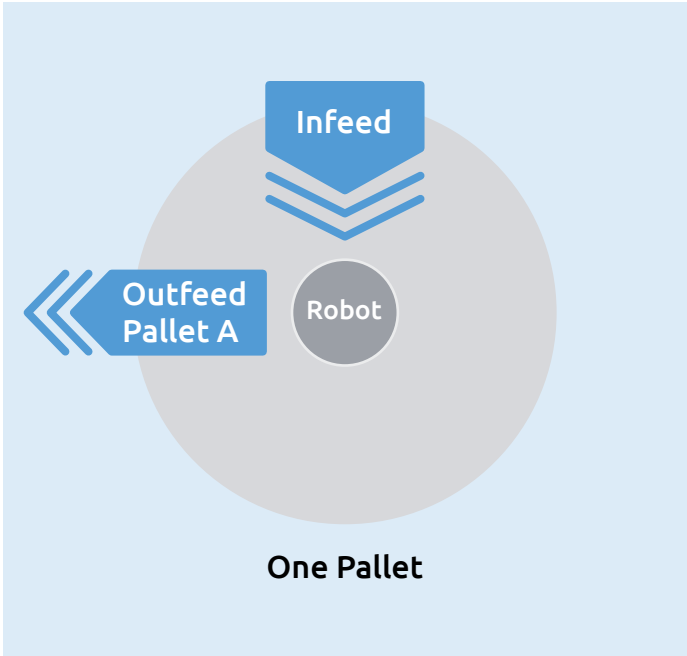
Environment Considerations

Be prepared for questions your system integrator will ask as part of researching your options. Your answers will help guide the best choice for your situation.

? **Will your automated palletizing system fit in your existing palletizing space** without moving your infeed system?

? **Is the space adequate for the robot arm to reach the conveyor and pallet(s)** without encountering obstacles or being a safety hazard for workers?

? **How many active pallets do you need**, and where do they need to be placed with respect to your infeed system?

? **How and when will full pallets be removed** and exchanged for empty ones?

? **Where and how often will workers need to enter the palletizing cell?**

System Requirements

Palletizing system requirements are defined by your business needs, now and into the future. By taking an application-first approach, you dramatically improve the likelihood that the system will continue to meet your changing needs, boosting productivity and speeding ROI. That approach is especially important for small and midsized enterprises (SMEs) with high-mix, low-volume operations, limited in-house automation expertise, and tight budgets.

In these situations, software becomes a critical element of the overall system. Powerful, intuitive palletizing software means lower integration costs and faster time-to-production. Reprogramming for new products, a different gripper, or to meet changing pallet size, type, or pattern can be done quickly in-house, even with minimal robot experience. And software that is capable of monitoring all elements of the system helps enhance productivity and reliability and minimize downtime.

System Considerations

Gripper
- Determined by workpiece assessment.
- Flexible collaborative grippers eliminate customization costs and give long-term reliability.
- Electric grippers eliminate the cost and space requirements of compressed air.

Pallet Stations and Slip Sheets
- Determine number and placement of pallets and slip sheets, if required.

Robot
- Maximum payload includes bracket, gripper, and workpiece and impacts reach.
- Horizontal and vertical reach must cover entire pallet. Note that smaller boxes require larger reach.
- Cycle time requirements may put robot speed outside collaborative limits and require safety guarding.

Software
- Intuitive programming speeds deployment and allows in-house changes for new products or palletizing requirements.
- Single software solution to manage all system elements allows fast, easy changes.
- Monitoring software optimizes program for reliability and output and alerts for maintenance requirements.

Lift
- Height of stack and robot reach determine if lift (7th axis) is needed.

Out-of-the-Box Palletizing

An integrated, configurable, out-of-the-box palletizing system is an ideal application-first approach. You get the flexibility to define your system around your unique business needs, but with all the benefits of a single vendor.

Results:

- Faster deployment and easier changeovers
- Fits into existing layout and workflows
- Lowers total costs and speeds ROI
- Future-proof for evolving business needs
- Fully tested, certified, and warrantied for reliability

Succeed with OnRobot Application-First Palletizing

Software

OnRobot Pallezixng

WebLytics

7th axis

Lift100

Pallet Fixture

1 x Pallet Station

2 x Pallet Station

Robot

Gripper

2FGP20

VPG20

Talk to the experts in application-first automation.

Speed your path to palletizing success.

Learn more about the flexible, intuitive, and cost-effective OnRobot Palletizer.

TALK TO AN EXPERT >>>

About OnRobot

OnRobot is the right choice for manufacturers who want the benefits of collaborative automation to build a resilient, productive business. No matter what process you need to improve, OnRobot can help you automate swiftly and seamlessly. With all the tools you need from one partner, you can focus on your business needs and manufacturing processes. You'll save costs and increase productivity while growing your business with flexible automation tools, unified programming, and easy deployment.

One stop, one system, zero complexity.

Headquartered in Odense, Denmark, OnRobot also has offices in Dallas, Soest (Germany), Barcelona, Shanghai, Tokyo, Seoul, Singapore and Budapest.

For more information visit: www.onrobot.com
Or contact us: sales@onrobot.com