

THE HERSHEY COMPANY

Hybrid Palletizing Solution Hits Sweet Spot for Hershey

Case Study



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Honeywell Intelligrated Integrates Alvey® Robotic and Conventional Palletizing System to Handle Hershey's Wide Range of Product

Please note: "Honeywell Intelligrated" within this case study refers to FKI Logistex. Intelligrated, which was purchased by Honeywell in 2016, acquired the North and South American operations of FKI Logistex in 2009.

At the Hershey manufacturing facility where packaging systems engineer Alex Diaz works, there is only one constant: constant change.

The plant manufactures Hershey products for an assortment of brands, including Hershey's®, Kit Kat® and Cadbury®, with a wide variety of low- to mid-velocity SKUs that can change seasonally, weekly, and even daily based on demand from the Hershey marketing team, retail stores and consumers.

For a company demanding this much flexibility, its packaging, logistics and material handling solutions must be up to the task. This was the challenge when the Hershey engineering group looked to an Alvey palletizing solution from Honeywell Intelligrated to successfully revamp and automate the palletizing operations at the Hershey facility.





Hershey packaging systems engineer Alex Diaz (left) and project manager Dennis Empson (right) chose an Alvey hybrid palletizing system to handle a constantly changing product line.

Until 2005, everything at the Hershey plant was hand-palletized, resulting in low palletizing rates and high manual labor costs. “We had three to four people palletizing per line, per shift, for three shifts a day,” said Diaz. “So we’re talking about 12 to 15 people palletizing at once, depending on how complicated the patterns were.” Employees were also doing a lot of heavy lifting — some boxes in excess of 50 pounds — leading to ergonomic issues and safety concerns.

When Hershey’s increasingly wide variety of product SKUs and packaging configurations started to require faster and more flexible palletizing, Diaz and fellow Hershey engineers knew it was time to make the switch to an automated system. Automated palletizing promised increased capacity, decreased labor costs, a safer work environment, and the versatility Hershey required for its diverse product line.

Fitting Big Flexibility Into a Small Space

Diaz, along with project manager Dennis Empson and staff engineer Matt Eroh, partnered with the Honeywell Intelligrated team to design an automated palletizing system that could handle Hershey’s low- to mid-velocity SKUs — ranging from one to 40 cases per minute. Keeping in mind that the entire system would need to fit within the tight space constraints of the plant’s approximately 7,000-square-foot palletizing area, the team weighed their two best options: conventional and robotic palletizing.

Almost immediately, it became clear that conventional palletizing, while fast and cost-effective, would not work with Hershey’s space restrictions. To implement a multi-line system with conventional palletizers, you need enough accumulation conveyor to accommodate up to two full pallet loads on each line, depending on load lengths and production rates; Hershey’s eight production lines required significantly more conveyor than they had space to accommodate.

Robotic palletizing, on the other hand, offered a more versatile option by enabling Hershey to send three different lines to one robot and palletize in three different positions at once. This greatly reduced the amount of conveyor required, but posed a problem of its own: The robots could not keep up with the production rates of Hershey’s higher-velocity SKUs.



“Most companies focus their expertise on either conventional or robotic palletizing,” said Diaz. “But the experience that Honeywell Intelligrated has with both technologies made the integration very easy and was the main reason that we chose to use a combination of both to meet our palletizing requirements.”

Alvey Hybrids Give Hershey the Best Solution

The project team quickly realized that a combination of robotic and conventional palletizing was the best solution to meet Hershey’s requirements, given the limited floor space available. They worked together to design a system that sends mid- to high-velocity SKUs to an Alvey 780 case palletizer, and low-velocity SKUs to one of three Motoman EPL 160 jointed-arm robots.

A partnership between Honeywell Intelligrated and Motoman, Inc. facilitated Hershey’s transition to robotic palletizing, a technology not previously introduced in this facility.

Honeywell Intelligrated’s Alvey hybrid design offered Hershey the best of both worlds and developed a unique palletizing solution for its product line.



The Alvey 780 palletizes higher-speed SKUs at a rate of up to 37 cartons per minute.

A Fully Integrated Solution

The new Hershey system includes a wide range of technologies offered by Honeywell Intelligrated, including the Alvey 780 case palletizer; photo-eye Accuglide™ accumulation conveyor, gravity roller conveyors; chain-driven live roller (CDLR) conveyors and motor-operated turntables; a high-speed, laser-positioned transfer car; and high-speed V-Belt live roller (VBLR) conveyors. The stand-alone PLC control system features fully customized code work by Honeywell Intelligrated.

Diaz and his crew were especially impressed with the photo-eye Accuglide powered roller conveyor, which provides zero-pressure accumulation of cartons. “The Accuglide conveyors are excellent,” said Diaz. “And the fact that the Honeywell Intelligrated team was able to integrate all these conveyors with their equipment made it much easier for us to get the complete package.”

Honeywell Intelligrated maintains the breadth of product line that allowed Hershey to choose the equipment that best suited their requirements for the lowest cost. A lot of integrators make the same claim but many times they force their limited product line into an application instead of applying the best available solution.

One of the biggest challenges of the project was finding an end-of-arm tool for the robots that could handle Hershey’s wide variety of SKU sizes and weights. Although Honeywell Intelligrated typically designs and manufactures the tooling for the robots they integrate, the team decided to outsource the end-of-arm tool based on the product specifications for this project. They chose to use a UniGripper® flexible vacuum tool from Tepro Machine & Pac System, which activates specific vacuum areas to create the necessary lifting forces for each package, based on the shape and location of cases programmed into the system. “I’ve installed some other robots, and this was by far the easiest to use and most versatile end-of-arm tool I have ever worked with,” said Empson.

Palletizing System Features Built-in Flexibility for Future Change

The new palletizing system gives Hershey the capability to easily integrate the remaining hand-palletized lines into the automated system by adding a spur conveyor and possibly a fourth robot based on future demand.

This built-in flexibility is something that Diaz agrees should be standard on all material handling systems. “Most of the SKUs that we started the project with were not being produced by the time we got the system running,” said Diaz. Three new patterns were added to the Alvey 780 palletizer before on-site work began, and up to 50 percent of product sizes and patterns were changed before installation was complete. Because of these packaging changes, Hershey commissioned the installation of pattern generation software for the Alvey 780, which Hershey had chosen not to include in the original system design.

“At first, when our packaging department came to us with a new pattern we had to send it to the Honeywell Intelligrated team to make changes to the PLC code,” explained Diaz. “This process required an engineer to analyze the new pattern requirements, ensure that existing patterns would not be adversely affected, program the changes, and then upload the code back to us. With the Honeywell Intelligrated pattern generation software, the Hershey plant operator can directly program the new pattern into the palletizer, test it, and have it operational in a matter of hours.”

The software is controlled by an easy-to-use, touch-screen display directly connected to the Alvey 780. After entering a password-protected “utility” mode, Hershey plant operators can add new patterns and make changes in real time. “The pattern generation software is a recommendation I would give anyone for this type of system,” continued Diaz. “It gives us the flexibility to make changes ourselves and get the new packaging configurations up and running quickly. With six new SKUs, it pays for itself.”



A Honeywell Intelligrated laser-positioned, rail-running transfer car brings completed loads from the robots to a turn-table that directs them to the stretch wrapper.

“Once we reached the point where the operators were comfortable with the system, we’ve been running efficiently,” said Diaz. “The fact that we have yet to call Honeywell Intelligrated to make adjustments to the system is a testament to just how well the training worked,” added Empson.

Training for Hershey Plant Operators

As part of the contract, on-site Alvey palletizer training was provided to more than 30 Hershey employees, including all of the plant’s forklift operators and electrical technicians. Select Hershey mechanics also visited Motoman for additional training on the robotic palletizers.

Hershey Engineers Beat the Clock

The integration team faced an aggressive timeline for installation of the new palletizing system. Once the installation process began, the Hershey team tore out conveyors, vacuum lifts, and other hand-palletizing equipment and employed hand palletizing in other areas throughout the plant.

Crews worked multiple shifts and overtime in a very tight space, but their hard work paid off. “We installed the entire system in five weeks and had it commissioned in three and a half weeks,” said Diaz. Working long hours, Hershey engineers checked the wiring of the entire system in less than three days, an impressive feat. Honeywell Intelligrated customer service engineers (CSEs) provided Hershey with technical support during installation and commissioning to help the team get the project completed.

From the Kitchen to the Consumer

In the main hallway of the Hershey manufacturing facility, an overhead system of conveyors and merges brings cartons of finished Hershey products to the palletizing room from various production operations around the plant.

SKUs with high production rates enter on the high-speed line, which leads directly to the Alvey 780 case palletizer. A barcode scanner identifies each SKU and its associated pattern, letting the Alvey 780 immediately palletize up to 37 cartons per minute. Positively driven, heavy-duty, chain-driven live roller (CDLR) conveyors and a motor-operated turntable direct each complete load to a stretchwrapper capable of handling up to 60 loads per hour.

Lower-velocity SKUs enter the palletizing room via three lines of case conveyor. Cartons are scanned and sorted at up to 25 cartons per minute by air-operated, right-angle pushers into seven lines feeding three Motoman EPL 160 jointed-arm robots, or bypass the robots to an optional hand-palletizing lane. The robotic portion of the system uses a laser-positioned, rail-running transfer car to transfer the palletized loads to the turntable with high speed and accuracy. The turntable then directs the palletized loads to the stretchwrapper.

The entire system feeds a single drop-off point, where fork trucks take the loads to the storage area until they are shipped to a distribution center (DC) for direct retail to mass markets. All the products in the automated palletizing process are palletized on cardboard slip sheets instead of traditional wooden pallets. “By removing a pallet dispenser we saved two things: space and money,” Diaz explained. “We do not ship on pallets, so the forklift operators only need to drive one type of forklift now instead of two.”

“We had a CSE come out who was excellent on both the conventional palletizer and the robot,” said Diaz. “He got up to speed very quickly and worked with us to move the project to completion.”

Safe, Reliable, and Easy-to-maintain Solution Provides a Real ROI

Since the completion of the project in June 2006, Hershey has seen increases in palletizing speed and efficiency, and has had no major problems with the equipment or the system to report. The equipment, which has proven to be reliable, is saving Hershey a great deal of money on manual labor costs, as well as greater potential savings from reducing ergonomic complaints.

Hershey engineers are happy with the system’s performance, and Empson has called the palletizing solution the “latest and greatest” in Hershey material handling systems. Honeywell Intelligrated’s team agrees that this has been a very successful project for everyone involved and looks forward to continuing to provide Hershey with the best material handling solutions on the market.

Throughout the course of his first major material handling project, Diaz said he learned a lot about adapting to new technologies and being prepared for future change. “Basically, nearly everything you plan has changed by the time you implement it,” noted Diaz, referring to the constant packaging changes he faced during the project. “Change comes quickly, and you have to adapt to it as quickly as possible to be successful.”

Hershey Palletizing System Overview

System overview:

- 1 Honeywell Intelligrated Alvey 780 case palletizer with slip sheet dispenser
- 3 Motoman robotic arms with UniGripper
- Honeywell Intelligrated Accuglide conveyor
- Honeywell Intelligrated belt conveyor
- Honeywell Intelligrated V-Belt live roller (VBLR) conveyor
- Honeywell Intelligrated E-Z Set™ live roller conveyor
- Honeywell Intelligrated gravity roller conveyor
- Honeywell Intelligrated chain-driven live roller (CDLR)
- Honeywell Intelligrated merges
- Honeywell Intelligrated laser-positioned transfer car
- Honeywell Intelligrated motor-operated turntable
- Honeywell Intelligrated air-operated pushers
- ITW Muller Octopus stretch wrapper

Conveyor System: Honeywell Intelligrated

Robotic Arms: Motoman

Intelligent Vacuum Tool: Tepro Machine & Pac System

Controls & Programming Software: Honeywell Intelligrated

System Design: Honeywell Intelligrated

System Integration: Honeywell Intelligrated

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