

# Rockwell Automation Integrated Control System Gives HERSHEY'S Visitors a Taste of Chocolate Manufacturing

Rockwell Automation technology and support enables guests to create customized candy bars.

## Solutions

### Integrated Control System

- FactoryTalk Transaction Manager software interacts with the SQL server, creating the ideal platform to integrate control systems with the retail environment that generates production orders
- Allen-Bradley CompactLogix and ControlLogix controllers provide the right level of performance along with tight integration
- EtherNet/IP manages real-time control and information flow at the machine-level and throughout the entire enterprise
- FactoryTalk View SE software gives operators the ability to access and control the entire line, as well as integrate their machine's programming into the Logix Control Platform
- Kinetix Integrated Motion featuring Allen-Bradley Kinetix 6000 multiaxis servo drives and MP-Series servo motors provide a seamless, cost-effective solution

### Services and Support

- Rockwell Automation Global Solutions engineers customized complex motion applications and programmed the equipment, acting as the primary system integrator prior to the attraction's opening

## Results

### Achieved Budget and Performance Metrics

- Completed on-time and within budget
- Hit performance goals initially set for the project

### Reduced Installation Time

- Rockwell Automation engineers helped install and wire the equipment in under two months

### Improved Reliability

- High-profile attraction has operated smoothly since its June 2010 opening



By using the Rockwell Automation Integrated Architecture system, Hershey brings together all aspects of its production line.

## Background

Three million people a year visit HERSHEY'S Chocolate World attraction, and many can choose to become custom candy makers when they visit Hershey, Penn. From the young to the young-at-heart, people line up daily at HERSHEY'S Create Your Own Candy Bar attraction at The Hershey Company's corporate visitor attraction in its namesake city.

Designed to immerse guests in the chocolate-crafting process, the interactive experience allows guests to design and manufacture their very own sweet sensation. Guests can dictate their own recipe for a souvenir candy bar, starting with the type of chocolate (seasonal choices of white, milk or dark). They then can choose three toppings from six ever-changing options, such as vanilla chips, chocolate cookie bits, almond pieces, graham cracker bits and pretzel bits. The final product comes wrapped up in distinctive packaging that visitors can design after watching their concoction come together on the production line.

Each step in the process is visible and virtually seamless – a testament to the innovative design behind this first-of-its-kind chocolate industry attraction, which relies on a completely integrated control system from Rockwell Automation.

LISTEN.  
THINK.  
SOLVE.®



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## Challenge

“If something goes wrong in a typical manufacturing plant, only a few employees see it,” said Herman Rhoads, senior staff engineer, The Hershey Company. HERSHEY’S Create Your Own Candy Bar attraction, on the other hand, gives everyone an inside look at our operations and really intensifies the need for smooth, streamlined production.”

When the production line was developed, the initial concern was ensuring that every guest received the bar they customized to satisfy their love for chocolate. The production system also needed the ability to process orders from the retail system, which included kiosks where guests place their orders.

Rhoads and his team also had specific metrics to reach regarding budget, timelines and performance. The deadline was particularly challenging. The team had only a few months to install all the equipment and ensure it ran smoothly before the attraction’s highly publicized grand opening in June 2010.

With the pressure on, Rhoads needed a vendor that could deliver both the technology and engineering support for such a complex project. He turned to Rockwell Automation, Hershey’s automation vendor for nearly 25 years, to provide the controllers, servo drives, networking technology, software and support needed for the attraction’s production system.

“With its range of price and performance levels, the breadth of Rockwell Automation’s product line allowed us to get the system that best met our needs,” Rhoads explained.

## Solutions

By using the Rockwell Automation Integrated Architecture™ system, Hershey brings together all aspects of its production line. HERSHEY’S Create Your Own Candy Bar attraction uses a variety of Allen-Bradley® CompactLogix™ and ControlLogix® controllers to provide the right level of performance, along with tight integration between the programming software, controller and I/O.

To help production information flow seamlessly, Hershey uses a single network for everything from starting and stopping equipment, to providing connectivity with IT-level systems. By using EtherNet/IP, Hershey can effectively manage

real-time control and information flow at the machine-level, and throughout the entire enterprise.

The SQL server acts as the hub of the entire process, interfacing with both the production and retail sides. Guests create their custom candy bar at kiosks, which modify the retail system’s order to create a custom production order. Then, FactoryTalk® Transaction Manager software extracts the guest name and barcode from the SQL server, so the production line can create the custom candy bar.

“Marrying the IT-managed, retail system to the production system was a first for us, and a rarity for most manufacturing environments,” Rhoads said. “The key to facilitating this real-time flow of information between the two environments is the ability of Rockwell Automation products to interact with the SQL server. FactoryTalk Transaction Manager gives us the ideal platform to integrate shopfloor control systems with the retail side that generates production orders and syncs up with the IT enterprise.”

Rhoads and the team worked closely with their IT department to make sure orders correctly correlate with the guest, and that the retail and production systems operate cohesively. Hershey uses EtherNet/IP as the link between the two worlds, following the IT department’s lead to implement a secure system that protects the integrity of the retail data. Using procedures and firewalls, Hershey’s IT team controls who has access to the process, which helps ensure operators don’t unintentionally alter a production order. For example, users can’t go from the process network to the retail system.

On the manufacturing line, the candy bar production process begins with the bar de-stacker, which picks plain bars of chocolate out of a magazine and puts them onto the manufacturing line. At the heart of this pick-and-place application is a Kinetix® Integrated Motion solution, which features an Allen-Bradley ControlLogix controller, Allen-Bradley Kinetix 6000 multiaxis servo drives and Allen-Bradley MP-Series™ servo motors.

Kinetix Integrated Motion provides a single, integrated solution for multiple disciplines, without additional robot and safety controllers, software and special custom-function blocks that are typically needed when incorporating a robot into an application. The Rockwell Automation® Global Solutions team customized the bar de-stacker, providing the motion expertise, programming and support. Ultimately, this gave Hershey a cost-effective pick-and-place solution.

As each candy bar moves down the line, its creator watches it on a display screen. The extra ingredients are added before the bar goes through the enrober, which blankets it with more chocolate. The conveyor then whisks it into a cooling tunnel to set the chocolate and finally to a cartoner that completes the process.

Using a common architecture allows Hershey to easily integrate the enrober, cartoner and other machines into this platform. Operators can easily take the programming and Allen-Bradley PanelView™ human-machine interface (HMI) screens from these machines, and bring them into the line's overarching programming environment. In this case, it's FactoryTalk View Site Edition HMI software.

This software acts as the line's supervisory system, allowing operators to access and control the entire line. Through one of the three terminals on the line, operators can access the current running status, parameters, speeds, temperatures and alarms of all equipment. They can intuitively understand and quickly resolve problems anywhere on the line, because the software provides a graphical representation of the entire production environment.

If a problem occurs at any part of the process, operators can't simply stop the line, since this could cause products to fall off the conveyor or be destroyed. Rather, operators need to bring the product to a safe condition in a way that preserves it and the guest's data, so he or she receives the bar they created.

To do this, Hershey uses a reverse smart belt, custom-designed by Rockwell Automation. The smart belt acts like a rubber band, pushing products to a clear area and away from the malfunctioning application or machine. Using a Kinetix Integrated Motion solution, the smart belt takes evenly spaced products and accumulates them at random until all products are cleared from the problem area.

Deploying a bar tracking system also helps make sure guests can locate and receive their bar. To do this, Hershey deployed fault-tracking algorithms as well as Allen-Bradley ArmorPOINT® I/O encoders that collect serial data from encoding sensors, including linear, rotary and optical distance measuring devices.



The interactive experience allows guests to design and manufacture their very own sweet sensation.

## Results

Hershey achieved its original objectives, and HERSHEY'S Create Your Own Candy Bar attraction successfully opened on May 26, 2010.

"We completed the project on time and within budget, while hitting the performance goals initially set for this project," Rhoads said. "I'm proud to say that the attraction has gone smoothly, with very little intervention and maintenance."

Hershey and Rockwell Automation made the tight timeline work, teaming up to install and wire everything in under two months. The Rockwell Automation Global Solutions team acted as the primary system integrator, programming the HMI system, bar de-stacker and the custom-made smart belt. They simulated all parts of the equipment, and HERSHEY'S Chocolate World went from I/O check to production in just two days. GES Technologies, a local system integrator, designed and built the panels, as well as helped with installation.

"Rockwell Automation's extremely knowledgeable, dedicated engineering team drove this project home," Rhoads said. "Their attention to detail and ability to turn our concept into reality on their hardware exceeded the expectations of this highly anticipated attraction."

*The results mentioned above are specific to The Hershey Company's use of Rockwell Automation products and services in conjunction with other products. Specific results may vary for other customers.*

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