

Country Maid Gains Production Intelligence to Meet Growing Demand for Hand-Braided Pastries

Company Partners with Interstates Control Systems, Inc.
to Improve Efficiency with Rockwell Automation Process Solution

Challenges

- Improve labor intensive, time consuming manual production and reporting process
- Meet growing demand by automating the facility

Solutions

PlantPAx Process Automation System with Production Intelligence

- Scalable, plantwide process control system with visualization, analysis and reporting portal for view into production trends
- System provides production intelligence by collecting and reporting data from disparate sources

PartnerNetwork Program

- Solution Partner, Interstates Control Systems, Inc. implemented process automation solution

Results

Increased Output

- Doubled product output with two automated lines and reduced mix time by 23 percent

Improved Production

- Eliminated manual production and reporting, improved operator efficiencies
- Insight into production reduces downtime and ensures batch consistency



Plantwide control PlantPAx system with built-in scalability offers production insight.

Background

Just as they have been for the past two decades, workers at Country Maid still braid their distinctive pastries by hand for fundraising groups across America. But that's the only part of the process that remains manual.

Ken and Marlene Banwart, the couple who founded Country Maid in 1991, began making pastries in their basement for the local farmers market. The baked goods quickly became a local hit. That's when the Banwarts realized their pastries could have wider appeal. They began freezing the raw pastries and creating new varieties, ranging from tart apple to cream cheese fillings, to be sold to nonprofits and school groups for fundraising activities.

The pastries are popular because they have a homemade taste and warmth. People let the frozen dough rise over night, put it into the oven to bake, and then enjoy it. Not surprisingly, the process for turning the ingredients into these tasty pastries is far more complicated.

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Country Maid automated dough mixer helped reduce the required machine size while increasing output.

In 2012, Country Maid decided to invest in an automated facility to respond to consumer demand for the Butter Braid® pastries.

Inside the Iowa facility of the now 100 percent employee-owned company, ingredients like dry milk, flour and sugar are stored in multiple holding bins and are transferred into an industrial mixer where they're combined with water. The mixture then goes into a rotary dough feeder that transfers it down a conveying line. Much like a rolling pin, a machine then spreads and layers the dough, which is then topped with butter and filling. Just before it is moved to the freezer, a worker puts the final touch on the 12-layered pastry, intertwining the top layers to create the signature look of the Butter Braid pastries.

Challenges

Prior to their upgrade, workers were far more involved in the production process – from hand batching and scaling every pastry to cutting open each bag of flour to pour into the mixer. Operators also collected and reported basic production data manually, leaving room for human error and inconsistency. This fully manual process was also time and labor intensive.

By adding automation to this process, Country Maid wanted to gain advanced data-collection capabilities to ensure each batch would retain the same high-level quality as the last. They also wanted to improve overall operational efficiencies throughout the facility.

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Country Maid had to add an additional line to help meet demand. They had two options when it came to designing the mix room. They could either replace their mixer with a larger one, which would require expanding their facility to accommodate its size, or they could install a smaller new mixer with the new additional automated line.

“We found that if we automated a new larger mixer, we could reduce the size of the mixer and avoid having to expand the facility. This option was less expensive and would achieve the same goal,” said Marc Banwart, systems integration specialist, Country Maid. “We knew the change would help us meet growing production requirements and give us access to data that would allow us to make better operating decisions.”

Solution

Along with the new second line, Country Maid wanted to automate the existing line. They did their research and decided on a PlantPAX® process automation system from Rockwell Automation as the core system for the two lines. Country Maid sought guidance and expertise from a third party to install and implement the solution, and partnered with Interstates Control Systems, Inc. – a Solution Partner of the Rockwell Automation PartnerNetwork™ program.

The PlantPAX system is a plantwide control system with built-in scalability that offers the production insight that Country Maid needed. The system includes a visualization, analysis and reporting portal, along with a process historian. This allows operators to view production trends, such as the balance of ingredients, and make adjustments to recipe rations.

As part of the PlantPAX system, FactoryTalk® VantagePoint EMI software was implemented to track and record data to pinpoint production trends. The software collects information from disparate sources throughout the production line so operators can view data on dashboards in real time on a variety of role-based dashboards. Operators use this data as a discovery and analysis tool, strategizing improvements for each batch based on various parameters, like temperature and dough consistency.

Operators can now monitor each batch based on the changing temperature conditions within the holding bins.

For example, Country Maid faced issues with consistent dough development and didn't know why. With VantagePoint software, operators were able to locate the source of the problem: the plant's flour silos located outside the building can be problematic due to climate changes. Operators can now monitor each batch based on the changing temperature conditions within the holding bins.

The system also provides a view into parameters that could affect production. “Operators can view how long downtime lasts, and when and where it occurs on a line,” said Raymond Berning, lead control systems developer, Interstates Control Systems, Inc. “This level of insight tightens control of production.”



Country Maid dough mixer with transfer conveyors for multiple lines meets growing production requirements.

Results

Country Maid wanted to gain quality data and tighter control on processes, and be able to make better decisions based on data from each batch. They achieved this and more.

The facility doubled product output, achieving one of the company's main goals. They also saw a 14 percent line-speed increase and a reduced mix time of 23 percent.

After implementing the PlantPAx process system, Country Maid had a wealth of information available to them, beyond how much water or sugar was added to a batch. Operators now know when to adjust parameters for a batch, and they know why adjustments need to be made. It's no longer an assumption or a guess.

"The same operator has become more productive with the automated process," Banwart said. "We can quickly determine if an adjustment needs to be made on a batch, and we make it."

By choosing to implement one highly automated mixer instead of a larger one and modifying the facility, Country Maid saved \$120,000 on equipment and avoided extensive production downtime. They're also able to utilize labor more efficiently because of the new data-collection capabilities, reducing batch labor by over \$45,000 per year.

The process solution improved reporting capabilities and production efficiencies beyond what Country Maid had anticipated. For now, the only part that their production process cannot handle is the hand-braiding component for each pastry – a task no machine has been able to duplicate with as much precision as a worker's hands.

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

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