Multinational Maker of Secondary Packaging Systems Standardizes Robotics on Single, Unified Platform to Deliver Simplified, High-Speed Solutions

CAMA Group Switches From Mix of Proprietary Technologies to Full Suite of Rockwell Automation Hardware and Software

**Challenge**

Migrate the automation and motion control systems used by CAMA Group’s robotic loading units into a single unified platform.

**Solutions**

**Integrated Motion Control**
- Allen-Bradley ControlLogix PAC provides an integrated platform for motion and machine control, and a single programming environment accessible to operators via an Allen-Bradley PanelView Plus operator interface.
- Allen-Bradley Kinetix multi-axis servo drives allow easy speed and position adjustments, and fast product changeovers.

**Integrated Safety Solution**
- Allen-Bradley GuardLogix safety system provides safety and standard control in a single package, and simplifies integrating robotics into an entire production line.
- Allen-Bradley Guardmaster safety relays provide compliance with global safety standards when integrating robots into machines.
- Allen-Bradley PowerFlex drives with safe-off function reside on the same EtherNet/IP network as other components for simplified machine design and production line operation.

**Results**
- Lower costs
- Leaner production line
- Common platform reduces spare parts
- Common interface reduces complexity
- Meets high-speed and performance requirements

**Background**

A renowned Russian confectionery. One of China’s largest yogurt producers. Italy’s No. 1 maker of single-serve “capsule” coffees. These are just three of the companies worldwide that have chosen the CAMA Group to custom design, engineer and build their secondary-packaging systems.

“Our strength lies in combining robot technology with packaging machinery,” said Paolo Mosca, electronic department manager at CAMA Group. The company delivers solutions primarily for the bakery, dairy and coffee industries, and increasingly, for manufacturers of non-food consumer items such as cosmetics and toiletries.

CAMA Group’s specialized robot technology is among the most advanced in the secondary-packaging industry. The company engineers four types of robotic-loading units, ranging from two to four axes, each with a different payload capacity and application capability.

“These aren’t just generic robotic arms that pick things up and put them down along the production line,” Mosca explained. “They are robot machines that carry out complex technical tasks such as managing and loading products on a continuous motion packaging line.”
For example, CAMA Group’s Triaflex robot – coupled with an intelligent vision system – can work in three dimensions, with 360-degree head rotation, picking random products from the production line belt and positioning them correctly in the packaging. The Triaflex robot is equipped with four controlled axes and carbon-fiber arms for gripping or placing products in all positions at up to 150 cycles per minute. Manufacturers use the robot to load a moving flow pack into a horizontal cartoning machine, for example.

“We design and develop our own line of robots in-house, and integrate them with an array of automated packaging machines,” Mosca said. “The result is a complete packaging and handling solution tailored to each customer’s unique requirements.”

**Challenge**

Increasingly, CAMA Group’s customers have asked for packaging systems with simplified controls. In response, the company decided to embark on a research and development project aimed at migrating the automation and motion control systems used by its robots from a mix of multi brand technologies to a single, unified platform.

“We strongly believe that the uniformity of our systems is absolutely fundamental, especially in gaining authority in the market and the trust of customers,” Mosca said. “If the machines on a line are different with regard to hardware architecture, software design and motor type, product reliability can’t be optimized, and more importantly, neither can the price for the customer.”

CAMA Group’s engineers recognized that a single platform would be much easier to commission, operate and manage for customers’ engineers, technicians and maintenance personnel. And, they wanted to meet customers’ consistent need for more compact packaging systems.

However, simplification and a smaller footprint couldn’t come at the expense of performance. “There’s enormous pressure in our industry to give the customer a high-speed solution they can’t find anywhere else in market,” Mosca said. “And we can never compromise the accuracy and efficiency of packaging processes.”

Such market competition created a compressed time frame to develop and deliver a new solution that standardized on a common control system that could meet all these needs.

**Solution**

In 2012, CAMA Group’s research and development team, along with its mechanical and electronic engineering department, teamed up with the Global OEM Technical Consultants (GOTC) at Rockwell Automation.

“We know the challenges of the market, so we gave Rockwell Automation specific production line requirements. And, of course, we gave them a very ambitious time target,” Mosca explained.

“Rockwell Automation helped us understand exactly how the system would perform. We worked together as partners to attain the highest speed for the application we were requesting.”

Rockwell Automation engineers decided on a modular approach to help CAMA Group adapt the solution to unique specifications of different manufacturing processes.

“From a technical point of view, we wanted to integrate logic and motion on a unique automation platform,” Mosca said. “The robot automation and control system had to fit different requirements: speed and flexibility in handling operations, synchronization of different axes in the plant, and easy product changeovers.”

CAMA Group designs and develops its own line of robots in-house and integrates them into an array of automated packaging equipment, such as the robotic cartoning system pictured here.
At the outset of the project, the blended team defined technical specifications to size the programmable automation controller (PAC), I/O, motors, servo drives, AC drives and operator interfaces.

At the heart of the system is the Logix Control Platform with integrated motion. The single control platform allows users to manage many different robot kinematics at the same time and fully synchronize separate tracking, handling and vision systems. It includes an Allen-Bradley® 1756-L72 ControlLogix® controller with a SERCOS (Serial Real-time Communications System) interface motion module.

End users can easily share production information across all equipment through a single EtherNet/IP™ network. EtherNet/IP uses the same TCP/IP protocol suite that is used for the Internet, delivering the open connectivity and global acceptance of standard Ethernet, along with the real-time performance and security of fieldbus solutions.

CAMA Group engineers are also able to link their optical character recognition and optical character verification vision systems to the Rockwell Automation products in the robotic cell via EtherNet/IP.

The system uses Allen-Bradley Kinetix® 6000 and Kinetix 6500 servo drives, which help eliminate the need for a dedicated motion network and allow users to support high-performance drives, I/O, smart actuators and any other EtherNet/IP-connected device on a common network.

In addition, Allen-Bradley PowerFlex® drives with safe-off function reside on the same EtherNet/IP network for simplified machine design and production line operation. The Allen Bradley MP Series™ Low Inertia servo motors fit compact space requirements while meeting the demands of the high-performance motion system.

Another important goal of the project was to improve operator safety and deliver a system compliant with global safety standard EN ISO 13849-1. The Rockwell Automation team conducted a safety risk assessment and implemented an Allen-Bradley GuardLogix® integrated safety system, which allows for safety and standard control on a single platform, alleviates complicated hardwiring, and reduces engineering time.

As part of the Rockwell Automation Integrated Architecture™ system, the GuardLogix PAC uses the same configuration, networking and visualization environment as the rest of the system. This integration provides users with fewer spare parts to maintain, while the control platform’s openness helps ease integration into an existing plant.

Unlike hardwired systems, the integration of safety and standard control provides operators and maintenance personnel with visibility to all machine events – including safety events – via an Allen-Bradley PanelView™ Plus human-machine interface. The knowledge and insight provided by the integrated system allows users to respond quickly and return the machine or line to full production.

To manage safety on smaller, individual machines with the robot system, the team adopted Allen Bradley Guardmaster® safety relays.

“The new control platform gives our customers a linear and lean production line,” Mosca said. “Furthermore, the modular approach allows us to apply the standard platform in future projects, saving design and development time.”

Multinational customers see Rockwell Automation as a highly experienced and reliable partner,” Mosca said. “Our customers told us that Rockwell Automation has the necessary knowledge about the secondary-packaging industry – and the primary-packaging industry – to deliver the top technologies at affordable prices.”
Results

CAMA Group has just begun installing the new system in customers’ factories, but already one customer has requested the same architecture on an additional packaging line. The Rockwell Automation GOTC team has worked alongside its CAMA Group partners all the way. “If help is requested by a customer, Rockwell Automation reacts very, very quickly,” Mosca said.

But the most successful element of the partnership, Mosca said, was the clear definition of specifications and targets – thanks to the highly skilled teams involved – and the shared project management methods. “Rockwell Automation allowed us to meet time-to-market requirements and keep costs under control,” Mosca said.

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

With 25 years of experience, CAMA Group provides robotic systems tailored to unique end-user needs.