

10% faster packaging achieved by Martini

With Omron's single Sysmac Machine controller

- 10% faster HFFS packaging
- Film changes without stoppages
- 30% less energy consumption
- Highest quality sealing – even for eco films
- Major maintenance cost savings
- Based on proven VFFS single controller

No stops for film changes

Not only is Martini's new HFFS (Horizontal Form Fill and Seal) system 10% faster in production, it also enables automatic changing of packaging films without machine stoppages, saving time and eliminating waste. It's thanks, in part, to Omron's new single NJ501-1400 Sysmac Machine Controller, which recently replaced two separate controllers to provide unified control of Martini's highly popular MLV130 system. A system that now has a double-sealing head and Long-Dwell profile, as well as a volumetric dosing unit for fast, precise weighing.

Highest quality seals

Also, a new Omron temperature controller in the system helps to reduce the time needed to reach the right sealing temperature and to maintain the right temperature during machine transitions, such as machine start/stop or production speed changes. High quality sealing is becoming increasingly challenging as the industry moves to more sustainable packaging solutions, which range from thinner plastic films to multilayer packaging and recyclable films for eco-packaging. Now these challenges are being fully met with the new Omron temperature controller, which reduces the time needed to reach and maintain the correct sealing temperature during machine transitions such as machine start/stop or production speed changes.

"The quality of the packaging seals is a key benefit of our solution," said Francesco Gusson - Chief Engineer of Electronic Dept. "The dedicated packaging algorithms of Omron's NX-TC temperature controller allow us to provide our customers a machine that can deliver the highest quality seals for a very large range of hot sealable packaging films."

Extreme small-lot flexibility

Changing consumer demands mean that producers must deliver a wider variety of products and smaller size lots. And that means that new packaging machines need to be able to switch production quickly, with minimal change-over time between runs. With its unified control system,



Martini's new HFFS (Horizontal Form Fill and Seal) system is 10% faster in production partly thanks to Omron's new single NJ501-1400 Sysmac Machine Controller.

the new Martini system can make changes to the motion profiles on the fly, adapting itself quickly to changes in production. It allows bags length and production speeds to be changed without wasting material or stopping the machine. For example, machine homing only needs to be performed when the machine is first powered up, to set up the initial position. Afterwards, by using absolute encoders and software programming, the machine can return automatically to the right axis position in case of any problem or format changes, and can immediately restart production without wasting time to perform homing.

How it's all achieved

By replacing the Omron CJ Controller and Motion controller MCH72 used in the previous solution with a single NJ501-1400 Sysmac Machine controller, the new system supports more flexible production. The controller manages both the packaging and dosing nodes over an EtherCAT network. The packaging node includes NX I/O for digital and motion inputs such as the encoder and high-speed inputs and all the temperature adjustment functions. The dosing node includes NX digital and analog inputs and a communication module to interface with Martini's customized hardware for high speed and high accuracy weighing and dosing. Through this node the full-motorized movements of the doser are controlled, thus substituting the pneumatic devices and obtaining a relevant reduction of energy consumption.

While reducing change-over time between runs helps boost Overall Equipment Efficiency (OEE), a high throughput during production runs is still key. With its single controller and user-interface, the MLV130 delivers a 10% increase in production speed, processing up to 130 packages/minute with a package length of 340 mm.

With the availability of all the machine data and configuration parameters, downtime and maintenance costs are also reduced. Having digital access to all the configuration parameters for the machine enables remote assistance, which reduces the cost of maintenance support. Martini engineers can simply connect to the machine remotely to access all the devices and quickly resolve issues even when a skilled engineer is not present at the customer location. And a digital troubleshooter helps users to easily resolve specific machine conditions or change settings. Finally, by collecting and processing data in the cloud, Martini can even identify potential issues and perform



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The Omron NJ501-1400 Sysmac Machine controller enables more flexible production.

preventive maintenance in order to further increase machine efficiency and program the necessary assistance service efficiently.

By moving to a single controller, the new systems provided better integration of the different machine functions, speeding communication and overall performances. As it can access and change both motion and PLC profiles for both nodes on the fly, production can be quickly switched to allow the packaging of different long-cut pasta batches. And connecting everything on a single EtherCAT network made it easier to access information for local and remote maintenance and configuration without having to make separate connections to each electronic device in the machine.

One design environment

"Sysmac Studio is one design environment for configuration, programming, simulation and monitoring. It enabled us to create function blocks for motion profiles based on our long expertise in the field. We could then apply these blocks in a reliable and easy way to deliver increased performance and flexibility for the HFFS system. Implementing the modular programming approach was easy with Sysmac studio Platform IDE (Integrated Development Environment)." stated Gusson.

Better sealing with AI

To handle all these different types of film, while still delivering the highest packaging quality and cutting precision, Omron developed a new approach for the sealing system. They developed a new bendable thermocouple sensor, which allows the temperature to be measured very close to the seal-jaw surface. Moreover, the machine uses Omron's new NX-TC temperature controllers, which integrate dedicated algorithms to deliver highly stable surface temperature measurements, thanks to Artificial Intelligence capability. This innovative solution means that the MLV130 can measure and control the sealing temperature very precisely. Temperature control is significantly less affected by the machine status (e.g. ambient temperature, sealing speed, film specifications, etc.) and the typical temperature drop when changing operating condition has been reduced by up to 20%.



Thanks to the new system, production can be quickly switched to allow the packaging of different long-cut pasta batches.

From VFFS to HFFS – with modular SW blocks

Martini has a significant experience with Omron's Sysmac controllers. They had already implemented VFFS (Vertical Fill Form and Seal) capabilities for their existing product range by using Sysmac Studio IDE. Based on this success and the added flexibility that the Sysmac platform had delivered for VFFS, they decided to redesign also the horizontal flow-pack using the same controller platform.

Omron supported machine analysis and configuration drawing on the two companies' previous collaboration in designing the vertical flowpack machines. This allowed Martini to develop a modular software structure, which has increased machine design flexibility, based on proven software libraries and software modules. The modular software blocks allow Martini to quickly adapt machines to meet new trends in technology and to address also changes in product demand. They also help to reduce development and engineering time, allowing the company to tailor the machines to specific customer requirements in very short time frames.



To better support their business, Martini added 2000 m² to their production site in 2017.

About Martini SRL – world leader in packaging

Thanks to the close collaboration with Omron for over forty years, Martini's packaging and weighing machines are renowned throughout the world as high precision instruments designed on customers' needs. Martini SRL has an extensive experience in the field of complete weighing and packaging solutions for dry pasta, both long and short-cut, but has also perfected solutions in fields such as snacks, bakery products, fresh and frozen food, powdered products, pet food, and more.

About Omron

OMRON Corporation is a global leader in the field of automation based on its core technology of "Sensing & Control + Think." Established in 1933, Omron has about 36,000 employees worldwide, working to provide products and services in more than 110 countries and regions. The company's business fields cover a broad spectrum, ranging from industrial automation and electronic components to automotive electronics, social infrastructure systems, healthcare, and environmental solutions. In the field of industrial automation, Omron supports manufacturing innovation by providing advanced automation technology and products, as well as through extensive customer support, in order to help create a better society. For more information, visit Omron's website: industrial.omron.eu