CUSTOMER SUCCESS STORY

# Samas and OMRON enhance end-of-line operations in medical diagnostics with a circular-tracking robotic cell

Samas

Italy

**Increased speed**
*Up to 80 parts per minute*

**Higher productivity**
*Elimination of repetitive manual operations*

**High operational flexibility**
*Predominantly digital, fast format changeovers*

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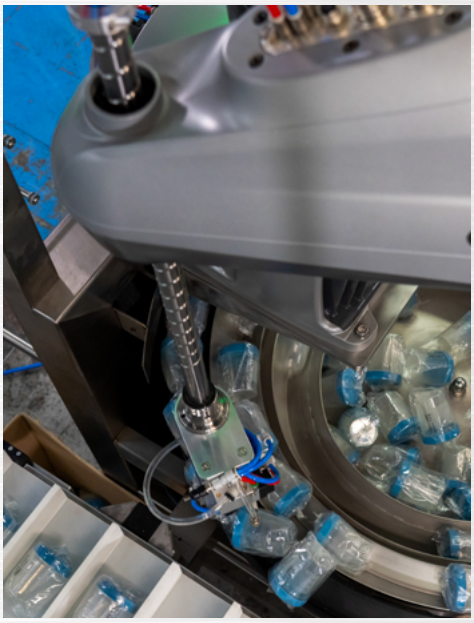
## Key Benefits

1. Higher productivity with throughputs of 50–60 parts/min, up to 80 parts/min
2. Drastic reduction of repetitive manual end-of-line operations
3. Fast, repeatable, predominantly digital format changeovers
4. Compact footprint suitable for space-constrained production environments
5. Increased process reliability and reduced waste
6. Fast ROI driven by lower operating and labour costs

## At a glance

Samas Italy and OMRON have developed a compact, modular robotic cell to automate end-of-line operations in medical diagnostics and other regulated industries. The solution integrates SCARA robots, vision systems, and OMRON motion control to optimise feeding to flow-pack and cartoning machines with a dedicated library for solving those kinds of challenges, the OMRON Robotics Packaging Library (ORPL).

By eliminating repetitive manual tasks, the cell increases throughput to up to 80 parts per minute, enables fast, predominantly digital format changeovers, and reduces footprint. The result is higher productivity, improved process reliability, lower operating costs and a fast return on investment, in a scalable solution applicable across multiple industries.



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# Samas and OMRON enhance end-of-line operations in medical diagnostics with a circular-tracking robotic cell

**To automate end-of-line operations in pharmaceutical, diagnostic, and cosmetic applications, Samas Italy has developed a compact robotic cell with circular tracking. The solution integrates SCARA robots, vision systems, and OMRON motion control to optimise feeding to flow-pack and cartoning machines with a dedicated library to solve such challenging applications, the OMRON Robotics Packaging Library (ORPL). The result: Higher productivity, reduced labour costs and a high degree of operational flexibility.**

In industrial packaging, flexibility, speed and reliability have become decisive competitive factors. Yet end-of-line automation remains one of the most complex stages to optimise. This practical challenge is at the heart of the project developed by Samas Italy in collaboration with OMRON: a compact, modular robotic solution designed to automate the **feeding of bottles, jars and containers** into flow-pack and cartoning machines, replacing repetitive, low-value manual tasks.

While developed to meet the specific requirements of customers in the **medical diagnostics** sector, the solution also opens up new possibilities for end-of-line automation across a wide range of industries, including pharmaceuticals, cosmetics and nutraceuticals.

## The challenge: labour shortages, rising costs and productivity limits at the end of the line

Founded in 2017 in San Casciano in Val di Pesa, near Florence, Samas Italy Srl is a young company with strong roots in industrial automation. The company primarily operates in complex B2B markets, including pharmaceuticals, diagnostics, cosmetics, food and chemicals.

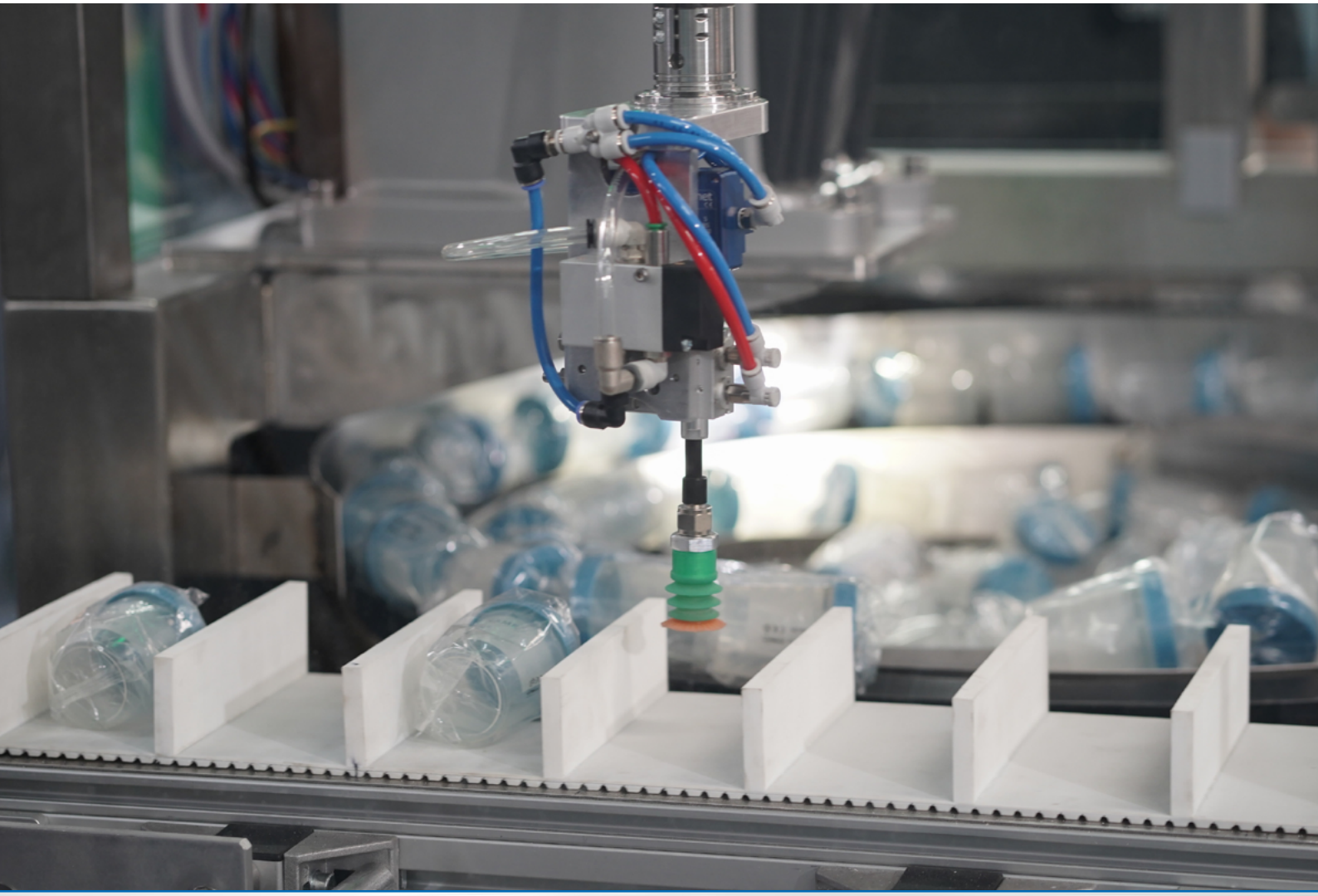
Growing demand for flexible, customised solutions for medium- to small-batch production, often with high format variability, has brought a widespread challenge into sharper focus: manual handling at the end of the production line.

The solution developed with OMRON for medical diagnostics jars was driven by this need. In this sector, feeding containers into final packaging machines is still frequently carried out manually or using conventional mechanical unscramblers with limited flexibility. As a result, operators are required to perform repetitive tasks over long periods, with a direct impact on operating costs and production continuity.

In recent years, these challenges have been compounded by increasing difficulties in recruiting and retaining labour, particularly for physically demanding, low-value tasks.

*"We realised that a crucial piece was missing to truly complete line automation,"* explains **Marco Alfani**, CEO of Samas. *"End-of-line operations were often the bottleneck, still managed manually, while upstream processes were already automated."*

The objective of the project was therefore clear: to fully automate feeding into flow-pack and cartoning machines while maintaining high throughput, enabling fast format changeovers, and keeping a compact footprint suitable even for space-constrained production environments.




This approach also enables extremely precise optimization of robot trajectories and motion profiles, resulting in smooth, progressive movements.

## The solution: a compact robotic cell enabled by circular tracking

To meet this challenge, Samas partnered with OMRON, a technology provider capable of delivering an integrated automation ecosystem combining robotics, vision systems, motion control, and PLC control.

The result is a compact, modular robotic cell based on:

- **OMRON i4H SCARA robots** for high speed and precision
- **OMRON FHV7 vision system** for dynamic part recognition
- **OMRON 1S servo drives and motors** for circular and linear motion control
- **OMRON NJ-series PLC** with **Sysmac architecture** for centralized control
- **OMRON Robotics Packaging Library (ORPL)**, the software core of the innovation

The distinctive feature of the solution is **circular tracking**, an advanced function that allows the robot to track containers arranged on a rotating ring, pick them while in motion, and place them onto a synchronized linear conveyor.

This approach also enables extremely precise optimization of robot trajectories and motion profiles, resulting in **smooth, progressive movements**. This is particularly important in applications where products are not rigidly constrained, such as bottles inside flexible pouches, where abrupt accelerations could compromise product stability. "*Thanks to the ORPL libraries, we can operate at much higher speeds compared to traditional systems*," explains **Stefano Calamai**, Software Engineer at Samas. "*The robot tracks the product during rotation, picks it synchronously, and places it without stopping motion. This reduces cycle time, mechanical stress, and overall machine footprint.*"

Another key advantage is **programming simplicity**. The entire cell was developed and managed directly within the **Sysmac Studio** environment, allowing full machine programming from the PLC without requiring proprietary robot programming skills. The ability to fine-tune each motion phase significantly increased overall cell productivity and accelerated time-to-market.

## Results: productivity, ROI, and new market opportunities

One of the most significant aspects of the project was the co-engineering effort between Samas and OMRON. The main challenge involved integrating vision and robotics on circular motion, as well as managing the **transition between circular and linear tracking** during placement.

"*The technical complexity was high, especially due to the reflective plastic film of the containers*," notes **Federico Arceni**, Field Sales Engineer at Omron. "*However, the native integration between robot, vision, and PLC, combined with the ORPL libraries, greatly simplified development.*"

The benefits achieved are concrete and measurable:

- **Productivity of up to 50–60 parts per minute, with peaks of up to 80 parts per minute** in some configurations
- Drastic **reduction of repetitive manual end-of-line operations**
- Predominantly digital, fast, and repeatable format **changeovers** with minimal mechanical parts
- Increased **process reliability** and **reduced** waste
- **Fast ROI** driven by lower operating costs

The solution also stands out for its modular design. Combined with the OMRON Sysmac Controller, it enables **up to four cells to be managed simultaneously** with a single control system, directly multiplying overall plant productivity.

**Compactness** is another key feature. The circular ring pick-up concept was specifically chosen to minimize footprint, allowing installation even in constrained production environments.

Finally, r**apid format changeover** represents a concrete advantage over traditional mechanical unscramblers. Most adjustments are software-based, with minimal mechanical intervention, ensuring high flexibility and extremely short downtime.

## A scalable model for the future of packaging

*"Beyond our initial expectations, we managed to further increase machine speed,"* confirms **Marco Alfani**. *"Most importantly, we truly completed line automation from start to finish, eliminating a critical manual bottleneck."*

For OMRON, the project also represents a flagship success story. *"We demonstrated how integrated automation can make robotics accessible even to machine builders with no prior robotics experience,"* concludes **Alberto Giannoni**, Field Application Engineer at OMRON. *"This is not just technology, but a true innovation-driven partnership."*

The co-engineering collaboration transformed a concrete operational need into a high-performance industrial solution. Not merely a response to a single requirement, but a scalable model for many industrial sectors where manual handling still limits growth—an example of how integrated automation can effectively address today's packaging challenges, from labour shortages to the demand for flexibility, without compromising reliability or performance.


*About Samas*

Samas Italy Srl is an Italian company with over 30 years of experience specializing in the design and manufacture of automatic and semi-automatic packaging machinery. It delivers customized solutions for assembling, filling, and closing pharmaceutical, diagnostic, food, nutraceutical, chemical, and cosmetic products. The company provides a complete service offering including installation, training, maintenance, and after-sales support, ensuring integrated, tailor-made solutions for specific customer needs. For more information, visit https://samasitaly.com/

*About OMRON Corporation*

OMRON Corporation is a leading automation company with its core competencies in Sensing & Control + Think technology. OMRON is engaged in a wide range of businesses including industrial automation, healthcare, social systems, device & module solutions. Established in 1933, OMRON has about 28,000 employees worldwide, working to provide products and services in more than 130 countries, contributing to the creation of a better society. For more information, please visit http://industrial.omron.eu