

# Pro Project Machinery develops world's first five-lane bag-in-box machine with OMRON technology

New energy-efficient full servo machine boosts production by 25%

*For manufacturing companies, any innovation that can boost production whilst also being more energy efficient is likely to be welcomed with open arms. And this is exactly the type of innovation that's been developed by Pro Project Machinery, with the help of OMRON Industrial Automation. The result has been the world's first ever five-lane full servo bag-in-box machine.*

Based in Cape Town, South Africa, Pro Project Machinery specialises in designing, manufacturing and assembling bag-in-box machinery. Its customers include the world's leading flexible packaging companies. The bag-in-box is a strong plastic bag into which a plastic tap is inserted, and the bag is then enclosed in a fibreboard box. The resulting item is then used for products such as wine, milk and water.

## Developing a world first

As part of its drive towards great innovation, production and sustainability, Pro Project Machinery recently took on its most ambitious project yet. It decided to design a five-lane servo machine for bag-in-box production. This would enable it to boost productivity without having to increase the number of operators - and the fifth lane would take up relatively little extra space. Servo machines provide over 30% higher energy efficiency than pneumatic machines and also give better repeatability across seals.

Pro Project Machinery already had a four-lane servo machine but decided that a fifth lane would provide greater benefits. However, no five-lane servo machines had ever been designed for this purpose before. The biggest challenge





that the company faced in developing the new machine was finding how to add the fifth lane to the fitment units. They had to work with the space constraints of the factory as well as the container restraints of the machine itself. This forced the company to come up with new and creative solutions for feeding the fifth lanes, including the design of new singulation processes and conveyor methods.

### Finding a suitable automation partner

To control different aspects of the new machine, Pro Project machinery needed a reliable automation partner. There were four key criteria it was looking for. The first was reliability – do the items always perform as they should, for a long time? The second was innovation – would this be the best technology the company could be using or is there something elsewhere that is more efficient and effective? The fourth criterion was performance – would the solution perform at the required speeds? The final aspect was cost – would the solution be cost-effective compared with options from other suppliers?

John Caine, the company's Technical Manager, comments: "In the past, we've used other suppliers for items such as programmable logic controllers, motors, cameras and safety systems. However, we soon discovered that OMRON provides the perfect balance between cost, reliability, performance and innovation. Thanks to its wide range of control components, OMRON has become a one-stop-shop for all our industrial electronics and control systems."

### Details of the new machine

For the new five-lane machine, the seal integrity of the bags is controlled with OMRON's closed loop torque control on its 1S Servo range, with each seal then being verified. Deviations across different bags are actively monitored for sealing force, temperature and dwell time. If a specific seal is shown to have different characteristics than the previous few bags, the machine will stop and warn the operator.

OMRON's FH vision camera is used to check each tap that is inserted for any defects. The orientation of the tap is then calculated by the camera, allowing the cartesian robot to pick up the tap in the correct orientation each time. OMRON's STC POE industrial cameras are used to inspect the tap insertion process and the web alignment whilst avoiding the need to cross any safety light curtains or to enter the machine.

OMRON's NX safety range, light curtains, non-contact door switches and e-stops were also deployed, and provide PLE safety compliance, with features that give the perfect balance between a safe and an efficient operation. The bag sizes are set up digitally, using servos rather than handwheels, as the servos give precise control and repeatability across various orders.

Finally, OMRON's NX7 programmable logic controllers (PLCs) give the company the strength to control over a hundred 1S servos on the machine, along with all the other tasks that

need to be controlled. The machine also boasts multiple human machine interfaces (HMIs), along with OMRON's HMI control software, and operator interfaces to provide an efficient operation.

During the testing of the machine, new sequences to control conveyors were also implemented, changing the way that Pro Project Machinery understands fitment feed control and opening up new possibilities for future machines. The new five-lane machine has a maximum speed of 10,200 bags per hour.

## A boost to production

John Caine reports: "The fifth lane allows for 25% more production with the same number of operators and roughly the same space requirements. To put it simply, Pro Project Machinery would not be what it is today without OMRON. OMRON has not only provided us with the products that we need, but also an overwhelming amount of technical support. In my opinion, our partnership with OMRON should serve as an example to other industrial automation suppliers."

### About Pro Project Machinery (Pty) Ltd.

For more information, please visit: <https://www.proproject.co.za/>

### About OMRON Corporation

OMRON Corporation is a global leader in the field of automation based on its core technology of „Sensing & Control + Think.“ OMRON's business fields cover a broad spectrum, ranging from industrial automation and electronic components to social infrastructure systems, healthcare, and environmental solutions. Established in 1933, OMRON has about 30,000 employees worldwide, working to provide products and services in around 120 countries and regions. In the field of industrial automation, OMRON supports manufacturing innovation by providing advanced automation technologies and products, as well as through extensive customer support, in order to help create a better society. For more information, visit OMRON's website: <http://www.industrial.omron.co.za>