

THINK BIG, START SMALL

Automation need not be intimidating for small manufacturers.



From left: Ray Reginato, Industry Segment Account Manager, Assembly & Handling for Festo Inc. and Jeff Cybulski, General Manager of PA/PI Divisions of PROMATION with the machine builder's recently developed robotic pick-and-place cell.

If you think your company isn't ready for automation – that it's too expensive or represents too much change – then you sound like Jeff Cybulski's ideal customer. Many firms, small ones in particular, often shy away from automation for those reasons, says Cybulski, general manager for the automotive and industrial divisions of Promotion Engineering of Oakville, ON.

"I think everybody wants automation – everybody knows they need it to progress – but there is a fine line between doing it and not doing it."

It need not be difficult, he says. One approach Cybulski advocates is to identify a single function or process that can be automated with a fast payback. Custom machine builders like Promotion provide turnkey solutions that include training and maintenance. They have their own engineering staff, and they can draw on vendor support, as Promotion did recently with Festo Canada for a project automating manual, end-of-line loading of

bundled shampoo bottles into boxes at a Toronto-area co-packing plant.

This end user had won a significant contract that required labour savings and throughput improvements. It issued a request for proposals for a flexible pick-and-place solution – two identical cells – with a minimum cycle time of 2.4 seconds per pick with 99% system uptime. The cells would have to be readily reconfigurable for up to 60 possible weight, size and volume combinations. The project assumed one-year full-cost recovery.

Though his group handles many larger projects, Cybulski says he especially likes smaller ones like this costing between \$250,000 and \$1 million. The turnaround time is shorter and their bigger competitors tend to shun such small jobs.

One of the challenges Promotion faced was finding a robotic pick-and-place system fast enough to meet the customer's requirements. Some potential suppliers weren't ready to meet the required cycle time. Enter Festo Canada's

Customer Solutions Group. Engineers for the two companies considered multiple solutions, including 3D gantries, before settling on a design built around Festo's EXCT-100, a two-axis, high speed linear gantry rated for up to 90 picks per minute with a payload of up to 10kg.

The largest variant in the line, the EXCT-100 is comprised of two fixed servomotors driving a toothed belt arranged in a T-shape. A Festo motor controller configured for Ethernet IP calculated the position of the interface. The synchronized interaction of the two servos results in the corresponding movement of the interface along the horizontal (Y) axis – think of a two-dimensional plotter, like a child's Etch-A-Sketch toy.

"You can have a really fast response on the Z axis arm – the pick-and-place function," says Ray Reginato, Festo Canada's industry segment account manager for assembly and handling. "It's actually picking up, dropping and coming back again in 2.4 seconds, or 25 times



PROMATION's pick-and-place solution incorporates Festo's EXCT-100, a two-axis, high speed linear gantry.

per minute. This highly dynamic pick-and-place solution exceeded the customer's expectations. We achieved this by optimizing the system to reduce weight and therefore increase productivity."

Festo provided all the electric and

pneumatic drives and accessories for the robot and bundle-positioning carousel for each cell. Promotion built the framing and safety protection and integrated all systems including conveyors and the Allen-Bradley PLCs, the latter sourced

from Rockwell Automation in Cambridge, ON. Festo also provided a week's training to the end user's staff in operating the cells, including reconfiguration for product changeover.

Festo Canada also created a unique function block – a simplified software bridge – just for this project to control its hardware from the PLCs. Normally, if machine builders use Allen-Bradley PLCs, they have to use its CIP Motion protocol. This can complicate matters for the end user and discourages the use of other vendors' hardware, like servomotors, in conjunction with the Allen-Bradley front end, says Alejandro Lopez, Festo Canada's senior controls engineer and creator of the function block.

"Some customers will go along with that (using Rockwell drives) because they don't have any other options to control servos," Lopez says. "We bypassed all that by creating the function block, which takes care of the advanced kinematics interpolation. The customer just has to provide us with a few data points, and we take care of the rest. They don't have to know anything about our software. They operate the system from within the Allen-Bradley environment familiar to them." The function block is an elegant solution to a long-standing industry issue that already has received interest from Festo branches in other countries.

Festo provided Promotion staff with some instruction on the use of the function block for making routine adjustments via the PLCs, "but it's pretty basic," says Lopez. "If there's something they cannot support, they will call us, and that's true of any other robotic cell or robotic provider."

Both Festo technology and support were decisive for Cybulski. Referencing the EXCT-100 gantry, he says Festo "has taken a great idea and made it better. Also, I can buy direct from Festo, so I know where my product is, I can talk to my sales person, I can call support. It's more customer-oriented. With most of the suppliers we deal with, we have to go through a third party." **DE**

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