[Industry]

TEKPAK Automation packages Schneider Electric's expertise to achieve an innovative solution

High performance with a delicate touch

PROJECT AT A GLANCE

Project Type
Industry

Location
Ireland

Applications
PacDrive P4 robot mechanics

CUSTOMER BENEFITS

- Simple embedded communications
- Stainless steel products clean room certified and reduces risk of foreign bodies
- Close working partnership and training
- Innovative products for complex packaging formats
- Improved machine accuracy
- Improved production efficiency

Robotics manufacturer Tekpak Automation Ltd has combined forces with Schneider Electric to reach an innovative solution for high-speed delicate product packing for the food industry. The collaboration has led to a new generation of robotic systems for Tekpak using Schneider Electric's proven PacDrive P4 robot mechanics. It has also seen Tekpak cementing its relationship with Schneider Electric by becoming a packaging systems integrator.

Ireland-based Tekpak specialises in the design and build of robotic loading, product collation and case packing systems, developing custom-built solutions for high volume food and pharmaceutical manufacturers. Having successfully developed its own range of controls and software for its two and three-axis robotic systems, the company responded to a specific customer requirement for a packing line capable of high-speed delicate product handling. The Tekpak Packman® Vision is a Robotic Loading Cell specifically designed for packaging applications. It is fully integrated with vision systems using Schneider Electric's PacDrive P4 robots and controls, with each robot capable of packing around 150 units per minute. In addition multi-pick grippers and/or multiple robots can be used in the cell to reach very high product rates of over 1000 per minute.

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>
> John Kehoe of Tekpak

The previous robots developed in-house by Tekpak have been designed for large payloads, typically with large multi-pick grippers weighing up to 20 to 30kg comprising groupings of between five and twenty products using large multi-pick grippers at a rate of 40 to 50 cycles per minute. The new application required a Delta robot capable of working at high speed, picking small individual and variably shaped items randomly orientated on the conveyor.

John Kehoe of Tekpak says: "We had by then been working with Schneider Electric for three years or more, integrating their control systems into our own technology. For this particular application we were looking to external suppliers for the Delta robotics. With Schneider Electric's PacDrive we found a number of unique features which were particularly suited to this application and Schneider Electric's communications protocols made it very easy to integrate their products with our vision system and collation conveyors."

For Tekpak, one of the key features of Schneider Electric's PacDrive is that it is made from stainless steel. With a focus on the food and pharmaceutical industries, Tekpak already makes around 90 per cent of its packaging systems in stainless steel, a strong selling point as John Kehoe explains: "Even in environments where it is not mandatory, many of our customers prefer equipment to be made from stainless steel to avoid the risk of foreign bodies such as microscopic paint chips or glass fibres reaching the product. The application we were designing for involved unwrapped food product, so stainless steel was the preferred material for the robotics. While price can inhibit the use of stainless steel, the Schneider Electric PacDrive enabled us to achieve a cost-effective solution."

The PacDrive P4 Delta robot is made almost entirely of stainless steel and has been certified by Germany's Fraunhofer Institute IPA as suitable for use in Class 6 cleanrooms in accordance with ISO 146-44. The servo drives are completely enclosed and except for the motor housings, all bearings are lubricant-free. The entire unit is suitable for washdown up to IP65 and so is also suitable for the dairy and meat industries.

As well as the PacDrive P4 robots, Tekpak's Packman® Vision incorporates two Schneider Electric LMC 400 PacDrive motion controllers, servo motors with integrated drive electronic motors in the robot axes, two Magelis colour touchscreens and Altivar low power AC drives. The entire packing cell, including tray de-nesters, carton erectors, carton closers and transfer mechanisms are controlled by the LMC 400 via distributed I/O OTB modules.
In operation, the PacDrive P4 robots pick from in-feeding vision conveyors which are tracked using the encoder tracking features of the LMC 400. The upstream cameras identify the exact size, shape and position of the items on the conveyor, storing this information in a FIFO buffer so that the robots do not interfere with the camera's view of the conveyor line. The required packing formats for 12 different tray/carton formats are stored in the Magellis touchscreens and this enables the LMC 400s to know where the incoming items need to be placed in transverse travelling box locations.

Keith Pugsley from Schneider Electric comments: "The scalable PacDrive offers all the functionalities of PLCs and motion and robotic control required for cost-effective, integrated and modular automation solutions. The system was designed primarily for high performance packaging and production machines and its use by Tekpak demonstrates its capabilities in top end robotics and pick and place systems."

Tekpak has integrated seven independent vision systems with the LMC 400 controllers, six of the cameras being used for product identification and the seventh as a quality inspection tool at the end of the packing process. Built into a stainless-steel frame design which offers complete stability and vibration-free operation, the system achieves a positioning accuracy of better than 1mm.

Commenting on the development process, John Kehoe says: "We were very impressed by the partnership approach taken by Schneider Electric. Their team was able to demonstrate very specific OEM packaging machinery expertise and we received a high level of local co-engineering support. This was further extended when three of our own engineers were trained directly at the Schneider Electric OEM solutions training centre in Germany. We undertook this project for a long-standing customer who was looking to gain competitive advantage by introducing significant production efficiencies. The support that we received from Schneider Electric helped us deliver the level of innovation that was necessary for this project and so further cement this relationship."

With the first Packman® Vision systems installed and operational, Tekpak has already initiated other high-speed projects in the dairy, meat, bakery and confectionery industries where emphasis is on the hygienic and high-speed handling of bare product. Tekpak has also developed a standard packaging cell using the P4 robot integrated with their standard high speed pocketed collator unit which can collate products such as wrapped bars and present them in groups to the P4 robot so dispensing with the need for vision and allowing a single robot to handle products at up to 450 products per minute. The company is now officially designated as a Schneider Electric integrator for the packaging industry and is working in partnership with the company on these new applications.

For further information about Schneider Electric please visit www.schneider-electric.com/uk or call 0870 608 8 608