

EtherCAT facilitates ultra-fast application of handles for packaging

Getting a better handle on multi-container packaging



PakTech makes handles to unitize two to twelve containers.

PakTech is manufacturer of sturdy plastic handles, which turn single packages into a kind of bundle that can be comfortably stored and transported. In addition, the company also builds the machines that attach the handles to a wide variety of container types. A switch to a Beckhoff PC- and EtherCAT-based control platform has helped bring PakTech an enormous increase in production speed while reducing space requirements in the control cabinet by an impressive 20 %.



The MPA60 features the rugged CP6201 Control Panel for HMI hardware that's well-suited for demanding plant environments.

Bundling plastic containers or PET bottles with small handles is simple, effective and saves materials and represents an environmentally-friendly solution for consumers. Jim Borg, founder of the Eugene, Oregon, USA-based PakTech and Oregon Precision Industries, Inc., developed a company from this idea. PakTech produces the most diverse carrying solutions for all kinds of containers for food, beverages, cleaning agents, body care products and more. The company's services range from the design and manufacture of the handles (using an injection molding process), and the optional attachment of barcode labels, to the design, manufacture and service of in-line application equipment. In addition to that, the company develops and builds the handle applicator machines with which the handles are pulled with a precise fit over the closures of the containers, where they are applied. Up to 12 containers or PET bottles can be bundled with such a handle, so that further packaging can be eliminated.



PakTech uses the two-channel, space-saving AX5000 EtherCAT drive.



Today PakTech has an extra 20 % of free control cabinet space to accommodate additional hardware requests from customers.

Performance increased and costs lowered using PC-based control

The packaging market is constantly under pricing pressures. Therefore, in order to remain competitive, PakTech sought a control solution for its handle application machinery that was not only elegant and powerful, but also inexpensive. "We needed to expand our control ability while reducing our costs – which we couldn't do with a separate servo platform and PLC platform such as those we had used in the past," explains Dan Shook, Director

of Operations at PakTech. "What we envisaged on one hand was greater openness of the controller. We also sought a user interface that was specific to our type of equipment so that the look and feel would be the same across different PakTech platforms."

Since PakTech has used a Husky injection molding machine with Beckhoff PC control to manufacture the plastic handles for several years, the decision was made quickly: "Through Husky, we see that the brand of PC-based control technology from Beckhoff is well-thought out, tested in the field for several years and is trouble-free," says Dan Shook. He also considers the possibility of remote maintenance to be a big advantage of PC-based control: "This way we can ideally support our customers and lower maintenance costs."

PC unites PLC and data management on one platform

The PakTech systems usually integrate with a conveyor. After the machine has detected the product on the conveyor, the plastic handles are applied to two or more plastic containers by means of a pick-and-place robot, so that they are firmly connected with one another. The correct application of the handles is subsequently checked and the products then move downstream for further packaging steps. The machine also communicates line speed to other systems in the plant. "The PC-based controller also allows us to provide machine information to our customers' ERP systems," says Dan Shook.

All-in-one control platform: compact, powerful and flexible

For the MPA60 multi-purpose applicator, which fits handles to 60 cases per minute, PakTech uses a CX1020 Embedded PC with the TwinCAT NC PTP



PakTech handle applicator for applying multi-pack handles on various bottles and packages



The versatile MPA60 from PakTech is a "Multi-Purpose Applicator" that can apply TwinPak® handles at 60 cases per minute.

automation software for PLC and Motion Control as the control platform. Visualization is accomplished using the Beckhoff CP6201 Control Panel and TwinCAT PLC HMI. Alternatively, PakTech also uses the C6920 Compact Industrial PC with Intel® Core™ Duo depending on the application. EtherCAT is used as the high speed communication bus. Whereas the EtherCAT I/O Terminals in IP 20 protection are accommodated in the control cabinet, the robust IP 67 EtherCAT Box modules are used directly on the machine and around the robot arm. For the motion system, PakTech uses the AX5000 series EtherCAT drives and servomotors from the AM3052 series.

"The CX1020 Embedded PC was selected because it's a flexible DIN Rail mounted controller and with its 1 GHz processor, it's a very powerful device for automation," Shook noted. "The CX1020 also provides a direct backplane connection to EtherCAT I/O terminals."

EtherCAT throughout

Systems from PakTech include one-touch operation, easy to set up controls and tool-less changeovers. "It cut our required training time in half for our customers because time previously had to be spent in the plant training the maintenance technician on how to navigate through the previous system. Now, the navigation is essentially as simple as pushing a button on the machine," says Dan Shook. "That's one more argument with which to convince our customers about this new control concept."

The machine-mountable EtherCAT Box I/O solution enabled PakTech to meet the requirements for high performance networking and data acquisition in the field to various areas of the machines. "In the past, all our I/O was central-

ized and we had a great deal of wiring back and forth to the field – EtherCAT Box I/O has eliminated this and the related costs and time required," says Dan Shook, and he explains: "With EtherCAT and PC-based control we can implement the motion and logic in the same controller. This was a technological leap forward for PakTech and, naturally, it helped us reduce required electrical panel space to a considerable degree."

Affordable, high performance packaging machine control is within reach

PakTech expects an additional gain in efficiency as a result of using the PC-based control system. "We're confident we'll maintain 99 % efficiency with installed machines and we're expecting a 20 % improvement in reliability over our previous design," summarizes the Director of Operations. "Today we have 20 % more control cabinet space to accommodate additional hardware requests from customers."

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