



New TL-10 Robotic Top Loader from Sabel Engineering

Sabel Engineering Corporation, located in Sonoma, CA, has recently added an innovative robotic top-loading case packer, the Model TL-10, to their successful line of case packers. The TL-10, with its very small footprint, is available in either stainless or mild steel. The stainless steel model is especially attractive to customers in the food and pharmaceutical industries. Besides the compact design, the new robotic top loading case packer offers a number of advantages to Sabel's customers, including the flexibility to run a wide variety of cases and products. Additionally, the new model provides the customer with a fast and reliable no-tool changeover system as a standard feature for simple, repeatable adjustments. Another distinctive feature of the TL-10 is the servo-driven infeed and case indexing system.

The standard model of the TL-10 robotic top-loading case packer includes a flexible 6-axis robot and an integral

case erector. A modular sealing section utilizing either hot melt glue or pressure sensitive tape can be added to the machine in order to provide the customer with a complete packaging solution. Compared to the competition, the case opening and positioning system provided by the TL-10 is exceptionally simple and reliable. Additionally, the Sabel TL-10 handles both case erecting and loading in a very small footprint.

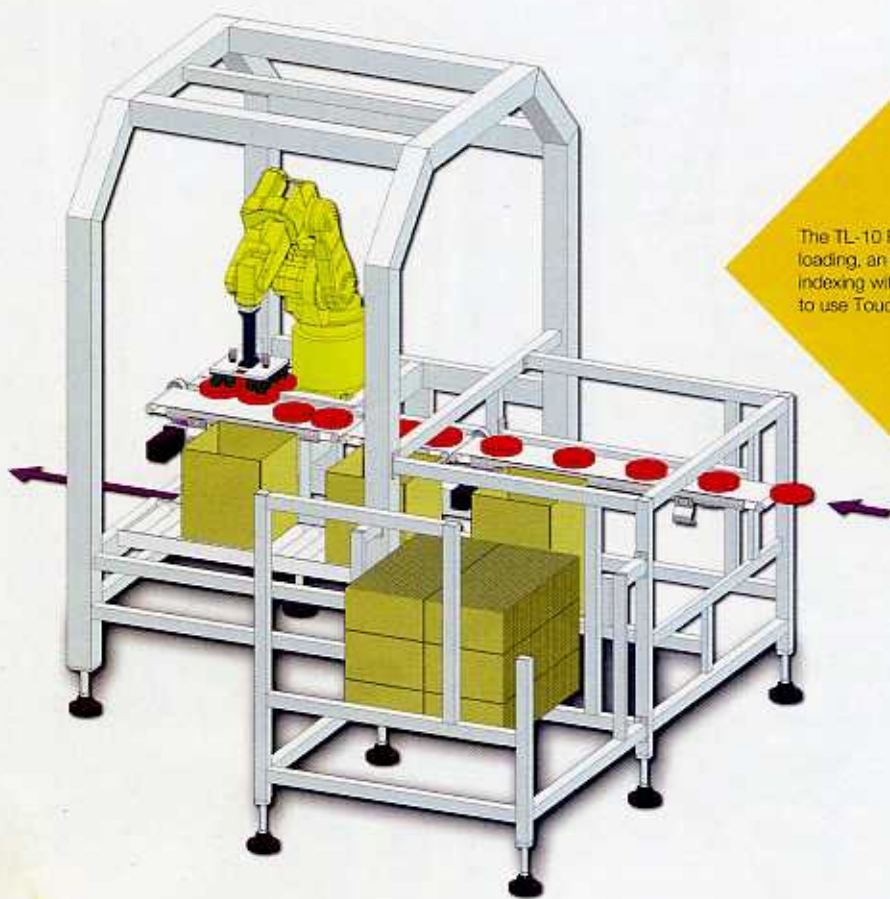
Critical processes

This unique robotic top-loading case packer did not come without initial challenges. The most critical process of the machine application is the precise staging of the bags for the loading process. This was accomplished by using three conveyors driven by B&R ACOPOS servo drives. The first conveyor, a random feed infeed conveyor, transports the product toward the loading station and guarantees adequate spacing between the individual items. The second conveyor, the product positioning conveyor,

indexes the bags forward and forms groups of four in this particular application. The third conveyor, the loading position conveyor, quickly advances the group of four to the pick station where the products are loaded into cases or bags with the robotic arm. Although the three conveyors perform different tasks throughout this application they are synchronized with each other at all times.

With ETHERNET Powerlink, positioning information is broadcast from one servo drive to the other via standard Ethernet cables. Cycle times of less than 400 μ s allow for very fast updates of information between the drives. This also does away with the need for additional encoder wiring between the drives, simplifying the wiring and reducing the amount of time spent on troubleshooting.

Another critical process is the presentation of the erected case at the loading station. "Our competitors build top-loading machines, but they do not have good case erecting and transport systems,"



The TL-10 Robotic Top Load Case Packer combines flexible case loading, an integral case erector, servo driven infeed and case indexing with a compact footprint, fast changeovers and a simple to use TouchScreen interface.

says Noel Barbulesco, General Manager with Sabel Engineering Corporation. The TL-10, in comparison, uses a servo-driven walking beam mechanism to present the cases properly at the bag loading station. B&R ACOPOS servo drives provide smooth and accurate positioning of the case for loading.

Innovative Machine and Hardware features

When starting the new machine development, it was clear to Sabel Engineering that it was necessary to use the latest in automation technology to make this machine more efficient and user-friendly than any other comparable solution on the market. In order to do so, Sabel decided to use the B&R XV valve controller module to simplify the connection of the pneumatics to the machine. What had required multiple large cable harnesses before was now replaced by one cable connecting all points from the visualization unit to the control cabinets via the B&R remote backplane X2X Link.

The TL-10 machine also has multiturn absolute encoders on the motors so the machine can recover from a complete power

loss and continue the production process where it left off. This eliminates the need to clean out product from the machine before the production process can start again, reducing down-time.

Additionally, the application features a secure restart E-stop which can cut the power to the motors in an emergency situation. With the secure restart E-stop, the machine can be shut down safely but

without losing the position of the motors. This feature again reduces down-time to a minimum as the production process can resume immediately.

Previous machines had junction boxes with a series of terminal blocks to connect the sensors (e.g. proximity sensor). With the new machine design, the sensors are directly connected into the B&R X20 I/O system.




The visualization unit, a B&R Power Panel PP220 with integrated I/O and 10" touch screen, serves as the main control unit. All relevant information, such as drive positions and speeds, error messages, etc., is available, and this makes it easy for the operator to make necessary changes to the machine settings and to inform the OEM of standardized error messages for easy troubleshooting over the phone.

Powerful software features

The machine's software features are powerful but simple at the same time. The machine is programmed using a single software development tool – B&R's Automation Studio. Additionally, the software has been developed using the standardized PackML packaging library (PackML is a working group within the OMAC Packaging Workgroup).

Sabel, a company that has been manufacturing quality case packing machinery since 1971, decided to switch from its previous automation supplier Allen Bradley to B&R for various reasons. First of all, B&R was highly recommended by Sabel's partners in the printing and binding industry. The hardware concept furthermore simplified the design of the machine and reduced wiring to a minimum.

Sabel received exceptional support from the B&R USA Partner PacMation, Inc. during the system design and start-up

phase. "PacMation's support was excellent. They sent two engineers to train our control staff and to assist with software development. Additionally, PacMation kept one engineer on-site during the machine start-up to ensure that everything performed as needed. We are looking forward to our next machine development in cooperation with PacMation," says Mr. Barbulesco. 

www.sabelengr.com

OMAC Packaging Workgroup

The Open Modular Architecture Controls (OMAC) Packaging Workgroup is an international user's group fostering collaboration among packaging end users, packaging machinery manufacturers, and technology providers to improve manufacturing effectiveness. Its mission is to maximize the business value of packaging machinery by developing guidelines that lead to the most appropriate application of advanced automation technology.

PackML is a subcommittee team of the OMAC Packaging Workgroup. It is also known as the Packaging Machinery Language team. PackML's assignment is to develop guidelines for line types, machine state models, and "tag" naming conventions for communications between production machinery within the packaging industry.

www.packml.org

www.omac.org



The first machine, which was presented during the Pack Expo 2005, has already been sold to an end user who specializes in packaging bags of empenada dough. The machine runs at a rate of 90 bags per minute and is able to handle two different bag sizes.