

PC-based control system for
hot-glue labeling machine

High velocity and precision powered by EtherCAT

The Chinese company E-Star Packaging Equipment Ltd. specializes in packaging machinery for the food and beverage markets along with shrink-wrapping machinery and fully automated carton packaging and labeling. Thanks to PC-based control and highly dynamic Drive Technology from Beckhoff, the new hot-glue labeler developed by E-Star achieves a remarkable throughput of 24,000 to 48,000 bottles per hour.



The CX1020 Embedded PC enables the integration of functions such as PLC, Motion Control, HMI and temperature control onto a single platform.

E-Star Packaging Equipment Ltd. holds a considerable market share in China's packaging machinery industry and is expanding this to the international level. In 2008 the company produced and sold more than 100 different machine types. The hot-glue labeling machine is a new development which is used mainly for labeling cylindrical-, elliptical- or rectangular-shaped PET bottles for treated drinking water, fruit juice and other beverages.

High precision – guaranteed

The containers are lined up vertically on the single-lane conveyor belt and transferred to the central carousel via a worm feeder. Here they are fixed and clamped between a centering head and a rotary table. The centered containers are then rotated around their axis and forwarded to the labeling unit. The feeding roller supplies labels continuously to the cutting roller. It is driven by a servomotor which adjusts its velocity to the length of the label and simultaneously checks the correct position of the cutting point. The label is cut to length on a special roller. It is then picked up by the transfer roller and taken to the gluing roller which applies glue to either end of the label. The label is transferred to the rotating container at which point the glue strips and a special smoothing device guarantee precise application.

Perfect interaction of all control components

The main requirement of the controller is to detect the label length extremely quickly in real-time and adjust the loading speed accordingly to ensure the correct position of the cutting point. The position of the print marking can be recorded precisely via TwinCAT NC. The positional data

is forwarded via EtherCAT to the CX1020 Embedded PC, which calculates the label length and adjusts the cam curve correspondingly. The loading velocity of the servomotor is adjusted in order to implement the loading process precisely. The controller ensures ultimate loading accuracy with < 0.01 mm deviation to avoid the occurrence of a cumulative loading error.

Prepared for the Future

The CX1020 enables the integration of functions such as PLC, Motion, HMI, and temperature control onto one powerful platform and guarantees the reliability and stability of the system. The automatic label-length detection function offers the customer huge benefits as different label formats can be handled without needing to make any adjustments. The Ethernet interface and Windows operating system also permit easy remote maintenance. EtherCAT and an AM3000 servomotor provide adequate scope to increase the current machine output rate even further. All this machine performance is available at an impressive price/performance ratio.

E-Star Packaging www.estarchina.com
Beckhoff China www.beckhoff.cn



The E-Star hot-glue labeling machine can label between 24,000 and 48,000 bottles per hour.