

# Accuracy and speed highlight EtherCAT-based filling and packaging application for tablets and pills

Precise counting, a production cycle of 60 packaging units per minute, minimum materials waste, as well as flexible adaptation to different tablet and pill formats were the ambitious goals Indian machine manufacturer, Parle Global Technologies set for the development of a new integrated multi-channel tablet counting and filling machine. A simple, streamlined user interface was another key goal to be achieved through the design process.



Integrated multi-channel counting and filling machine for tablet and pill packaging in bottles.

Parle Global Technologies Pvt. Ltd., headquartered in Mumbai, India, is a supplier of high-performance machines for pharmaceuticals, food and beverage, as well as the packaging industry. The company's range of machines for the pharmaceutical industry encompasses the pressing, checking, counting, filling, and packaging of tablets and capsules, in compliance with the strict hygiene requirements necessitated by this industry.

During the project planning phase for the multi-channel tablet counting and filling machine, the focus was placed on the high-speed feeding of the bottles, optimized vibration control, the precision counting mechanism, as well as interfacing to upstream and downstream machines. Parle had already gained experience in the past with different fieldbus systems, though the results had been unsatisfactory in terms of accuracy and process speed. "Leveraging the high performance, PC-based control system with EtherCAT fieldbus technology, we were able to meet these requirements," explains K. Eswara Krishnan, Chief Operating Officer of Parle Global Technologies. He continues: "The bottle feeding screw, driven by a Beckhoff stepper motor, EtherCAT I/O Terminals to control the separating devices, and the vibration control were crucial to efficient and error-free counting and filling of the tablets." Sensor logic for the ejection of empty bottles was also installed, along with an automatic start and stop function in the event of too few bottles being fed, or a bottle jam at the output of the machine.

#### **Compact and simple to implement: Panel PC integrates PLC and motion control functionality in one device**

"The control platform consists of a Beckhoff CP6201 12-inch touch Panel PC with TwinCAT PLC and motion control run-time, as well as EtherCAT I/O Terminals and the accompanying stepper motors. The system as a whole is exceptionally compact and simple to implement," says K. Eswara Krishnan.

"This not only allowed us to reduce the control cabinet footprint, but also simplify the wiring. All sourced from Beckhoff, the AS1060 stepper motors, as well as the compact stepper motor terminal with configurable step frequency, 64-fold micro-stepping and more than 1,000 positions per revolution, highlight the feature-rich multi-channel counting machine. With this solution, Parle has been able to eliminate the previous bottleneck in the counting accuracy," K. Eswara Krishnan notes.

The new Parle machine is equipped with a three-stage multi-track tablet feeder, and the speed of each stage can be intelligently controlled in such a way that the desired counting accuracy is achieved at the chosen production rate. The EtherCAT I/O Terminals acquire the fast pulses from the various counting sensors at the end of each section. The complex algorithms were programmed according to IEC 61131-3 standards in TwinCAT. Control of the vibration tablet feeder and an optimum flow of tablets were critical machine design considerations, which were answered through synchronized control of the analog outputs. "Our expectations for machine cycle time, 100 percent counting accuracy, and zero scrap were entirely fulfilled by PC-based control from Beckhoff," K. Eswara Krishnan concludes.

Further information:

[www.parleglobal.com](http://www.parleglobal.com)

[www.beckhoff.co.in](http://www.beckhoff.co.in)