



Vision Sensor Helps Automate High-Speed Loading of Transparent Cartons

A major beverage manufacturer uses transparent cartons to package its bottled drinks so that their distinctive branded labels are visible to consumers. However, the need to orient the bottles so that the right part of the label is visible makes automated packaging a challenge. In the past, bottles were filled on an automated line, and a team of 15 people were tasked with manually loading and orienting the bottles into the transparent cartons. Recently, this beverage producer became the first to successfully automate high-speed carton loading with the use of a bucket autoloader cartoner from AFA Nordale Packaging Systems, which uses Cognex Checker® vision sensors to orient the bottles before they are placed in the cartons.

“Orienting bottles at a speed of 30 or 60 bottles per minute would not be a major challenge,” said David Langen, Electrical Engineer for AFA Nordale. “But in this application the beverage manufacturer needs to pack 450 bottles per minute.”

AFA Nordale, a leading producer of cartoner machines, evaluated sensors from all leading vision companies. Each sensor seemed to have problems with one or more label types. “For example, one sensor worked with the red labels but not with the black or blue labels,” said Sergiu Dinescu, Electrical Engineer who developed the machine for Nordale. “Another sensor worked with the red and blue labels but not the black labels.... Then we tried the Cognex Checker 3G1 and found that it was able to read all of the different labels without any difficulty.”

The cartoner orients the bottles by simultaneously spinning 14 bottles while 14 Cognex Checker 3G1 vision sensors view each bottle’s label. The Checker vision sensors then send a signal to stop spinning each individual bottle as soon as they see a letter that indicates the label is in the correct position. A cylinder in the orienter then lifts the bottle off the belt.

During machine validation, the orienter demonstrated the ability to position the labels within +/- 14% of dead center, well within the +/- 30% requirement of the bottle manufacturer. The success rate in orienting the conveyors is 99.9%.

With the critical vision problem resolved, AFA Nordale engineers were able to design a complete cartoner system that meets the beverage manufacturer’s requirements.

“Up to now, drink manufacturers have avoided using cartons with windows because there has been no satisfactory solution to the problem of orienting bottles at high speed,” said Nordale’s David Langen. “This new machine is the first to solve this problem by combining the latest vision sensor technology with an innovative mechanical solution. The machine meets the beverage manufacturer’s requirement of 450 bottles per minute and has been tested to 600 bottles per minute. In both cases the Cognex Checker 3G1 vision sensors have been able to align every single bottle except for those with misformed sleeves.”



Summary