



Industry:

Food and Beverage



Applications:

Cardboard in-feeds or feeders for Case Packers and Cartoners



Problem:

Double feeds and mis-feeds (mis-alignment or no blank present) of cardboard blanks in case packers and cartoners are common problems in packaging operations. The problem is usually associated with variations in the cardboard density and or environmental conditions such as excessive humidity that makes the stacked blanks stick together. Without constant monitoring, mis-feeds can lead to machine jams and damage that causes costly downtime and can affect up stream production equipment.



Omron "FACTS" Advantage

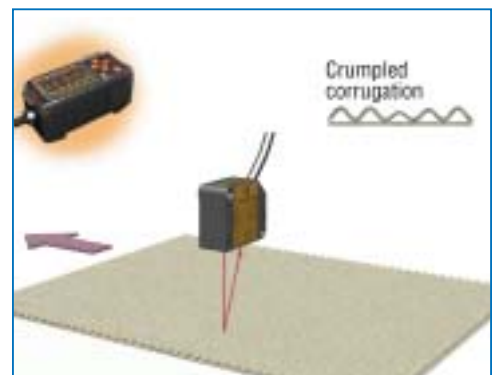
ZX-LDA sensor amplifier

ZX LD40 laser sensing head

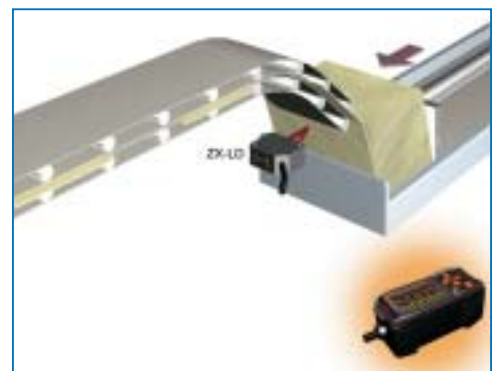
Omron's ZX "smart" sensors provide highly accurate and reliable monitoring of cardboard feeding systems and alert operators and control systems of problems before they can cause serious process interruptions. Only one ZX sensor is needed to detect double feeds, misalignments and null feeds. The sensor's compact size and precision non-contact sensing enables easy mounting and set up. With it's high-speed response - as little as 10 milliseconds per inspection, the sensors can keep pace with even the fastest machines.



Application Diagrams



Inspect height of corrugations in cardboard boxes to detect crumpling that may weaken the finished carton.



Counting sheets of wrapping paper.

Double Feed Detection Application Details

Issue

Food and beverage producers are under enormous pressure to evaluate virtually every aspect of their production and packaging operations with an eye toward improving quality, efficiency, and machine uptime while reducing waste. In the packaging arena, a common problem is the double feeding or mis-feeding of cardboard blanks into cartoners and case packers. Constant monitoring is required to clear the jams caused by double sheet feeding and misaligned cardboard blanks that can cause significant machine downtime, lost productivity and affect up stream operations, causing them to slow, too. By detecting feeding problems immediately through constant monitoring, packagers can prevent costly production losses.

Cause

Mis-feeds and double feeds in cardboard (or chip board) in-feed systems can be caused by a variety of common problems. Because cardboard behaves like a sponge, it can absorb moisture from the environment, which can cause it to be less stiff and swell or warp. Variations in the content of source materials can also contribute to mis-feed problems. Wear on the gripper wheels can also produce in-feed problems.

Omron's Unique Solution

Omron's ZX laser sensor provides a highly accurate and reliable, non-contact monitoring system for cardboard in-feed systems. Its compact size and long sensing distance allows engineers mounting flexibility to keep the sensing head out of the way. Built-in control outputs for High/Low/Pass allow the sensor to directly control alarms or system shutdown while simplifying control system complexity. The ZX's "self peak" function allows it to work without a separate "trigger" sensor, further reducing cost and system complexity.

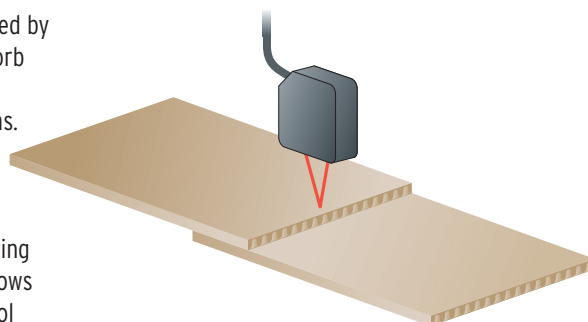
Available software enables easy sensor set up, real-time graphic displays of sensor operation and data logging.

By mounting the sensor directly above the in-feed conveyor, the sensor precisely measures the distance between the cardboard blank and the sensor. When a double sheet is fed, the sensor detects the change in height and signals an alarm for the mis-feed.

Output from the sensor may also be directed to the machine controller to serve as an absolute feedback to the system that no double feeds are present.

Results

100% monitoring of the cardboard feed systems with the ZX "smart" sensor virtually eliminates costly machine downtime due to double feeds, misalignment of cardboard blanks or missing blanks in cartoning and case packers. Problems are detected at the earliest possible moment allowing more time to prevent jams. The inspection is 100% verifiable so no additional resources are required, and the optional monitoring software provides powerful data logging and trending tools that assist in preventive maintenance operations.



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