Honeywell Intelligrated

Precise Cross-Belt Sortation: Unlocking Efficient E-Commerce Distribution

In the Pursuit of Fast-Paced, E-Commerce Distribution, Accuracy = Speed



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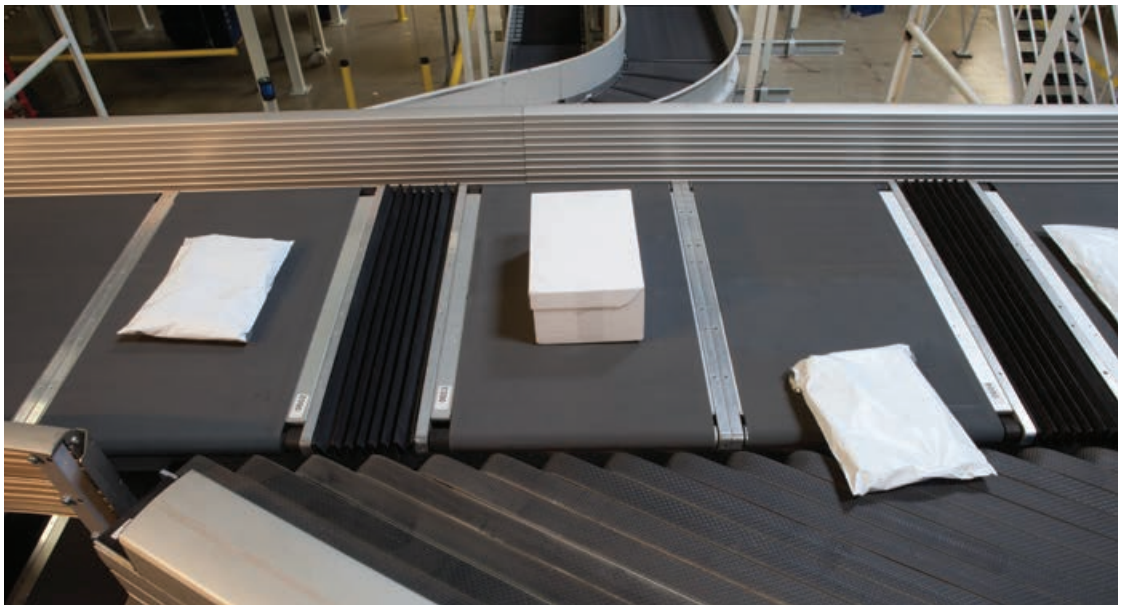
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The convergence of technology and commerce continues to be a major trend in global economies. eMarketer projected worldwide e-commerce to surpass $1.6 trillion in 2015, with China and the U.S. leading the way.

Successful companies have consistently demonstrated the ability to meet high customer service expectations through every step of the sales cycle. Jeffrey B. Graves, president of supply chain specialist Sedlak Management Consultants Inc., cites many facets to the customer experience, including a wide selection of products, mobile-site ordering capability, order accuracy, fast and free delivery, and free returns. Graves observes, "In e-commerce, the distribution center provides much of the customer experience."

Fulfillment operations and their material handling partners must therefore continuously innovate to provide a seamless shopping experience. This mandate comes with challenges.

"In e-commerce, the distribution center provides much of the customer experience."

E-Commerce Fulfillment Challenges

The first challenge is time, dictated by quick order turnaround, fast-paced fulfillment, and efficient shipping and transit. But speed is more than an operational metric, as MHI reports indicate a link between delivery speed and customer trust.

Another challenge is evolving order profiles, characterized by increased complexity, variable product sizes and packaging types, and overall higher volume. According to MHI, single-line orders account for 64 to 66 percent of transactions during off-peak season and 56 percent during peak season. The same paper notes, "smaller order sizes induce heavier workload and increase difficulty to sort and accumulate items for individual shipment."

The third and most important challenge is accuracy. Sending the wrong item to the wrong place causes recirculation, risks missed shipments, clogs system capacity, and ultimately damages the customer experience.

To meet these operational challenges, automation plays a critical role. It delivers:

1. **Speed** to meet delivery windows
2. **Flexibility** to handle a range of product characteristics
3. **Accuracy** to save time and increase throughput

The third and most important challenge is accuracy.



Cross-belt sortation in particular is well suited for e-commerce fulfillment because of its product-handling characteristics and high operating speeds – up to 3 meters per second and 20,000 to 25,000 units per hour. Precise diverts are key to accuracy due to the limited window of time to divert product from carrier surface to sortation chute.

However, legacy cross-belt sortation systems can struggle to meet the requirements of contemporary distribution operations.

Where Legacy Technology Falls Short

Most sorters do not account for differences in item size or packaging type. This is particularly problematic, as distribution centers commonly customize packaging to comply with evolving shipping requirements, and third-party logistics and fulfillment outsourcing providers handle an even broader, less standardized range of packaging for a diverse client base.

Popular packaging methods such as polybags, bubble packs and envelopes present unique challenges.



Near-perfect 99.99 percent divert accuracy

Polybags, for instance, can hang over equipment sidewalls, become a pinch point between the sorter track and chute, and result in a jam. Jams can damage product and temporarily shut down the entire system, resulting in significant throughput losses with each passing minute.

Additionally, most cross-belt sorters assume items are centered on the belt. But if items are not, the risk of jams, missed chutes and recirculation increases due to inaccurate diverts. At a speed of 2.6 meters per second, an item 5 centimeters off center will end up nearly 9 centimeters from the intended target and may miss the chute altogether. Increased speed results in greater inaccuracy. For these legacy sortation systems, divert accuracy is very much dependent on accurate upstream induction.

Dynamic Discharge Compensation: A New Level of Precision

Dynamic discharge compensation (DDC) is a powerful technology that eliminates these recurring divert problems.

Using enhanced vision technology, DDC accurately detects each item's exact size and location on the belt. The camera relays this information to intelligent automation software, which uses it to automatically adjust discharge timing by a few milliseconds earlier or later. DDC does not attempt to physically center inaccurately inducted items, nor must it do so to achieve near-perfect 99.99 percent divert accuracy. The technology can be implemented as an upgrade to select cross-belt sortation systems and as a core component of a sortation solution.

Operational Benefits of DDC

Implementing DDC provides numerous benefits that improve customer satisfaction and operational efficiency.

1. Minimize divert errors.

DDC decreases the likelihood of divert errors, including jams, missed chutes and recirculations, enabling a more efficient fulfillment operation. Decreased system downtime, manual touchpoints and misrouted items can increase a system's throughput, with a general increase of 10 percent greater productivity, depending on volume and product mix.

In addition, DDC enhances upstream and downstream process efficiency. For example, suppose a pair of gloves and a scarf must get to the same station for packaging into a single shipment. A divert error for either item can result in delaying the entire shipment, shipping only half the order or sending the complete order to the wrong destination.

2. Increase chute density.

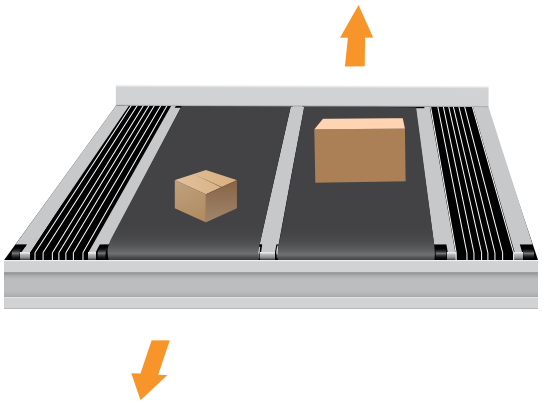
The enhanced level of divert precision enabled by DDC allows operations to increase chute density and expand operational capacity without occupying additional space. For an operation with 75 3-foot-wide chutes, reducing chute width by just 6 inches would allow 10 additional chutes in the same area, increasing capacity by 13 percent.

3. Reduce equipment wear.

DDC solves the common error of non-centered items without physically rearranging product on the belt. Only moving the belt for item discharge improves energy efficiency and extends the life of motors, bearings and belt components. In addition, the increased discharge accuracy reduces the impact on sidewalls due to items traveling at an incorrect trajectory.

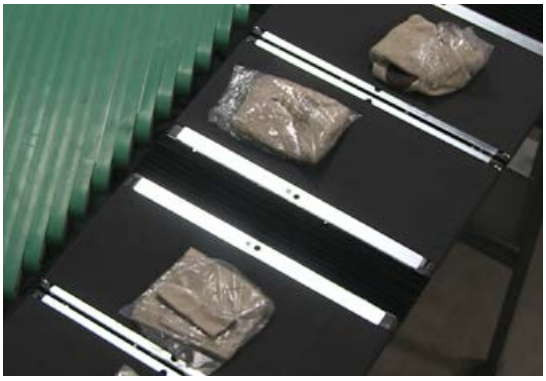
4. Optimize large-belt, single-carrier sorter configurations.

DDC enables large sorters between 1,000 and 1,400 meters wide to perform double duty, meaning that larger items can be moved on one side and smaller items on the other, effectively raising system capacity. For instance, a double belt can be configured to carry larger items in one direction while simultaneously carrying smaller items in the opposite direction, as illustrated below.



For more information, contact Honeywell Intelligrated® by email at info@intelligrated.com, by phone at 866.936.7300, or visit www.intelligrated.com.

Conclusion



In the burgeoning e-commerce market, speedy delivery and diverse offerings are customer expectations. The ability to deliver these via a seamless customer experience will increasingly separate leaders from laggards. Fulfillment operations play a central role, with accuracy being a mandate and ultimate enabler of success. DDC's proven 99.99 percent divert accuracy offers retailers a decisive competitive advantage.

To learn more about DDC, visit www.intelligrated.com/product/sortation-systems.

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