

Solution Guide

Automated Order Consolidation





Introduction

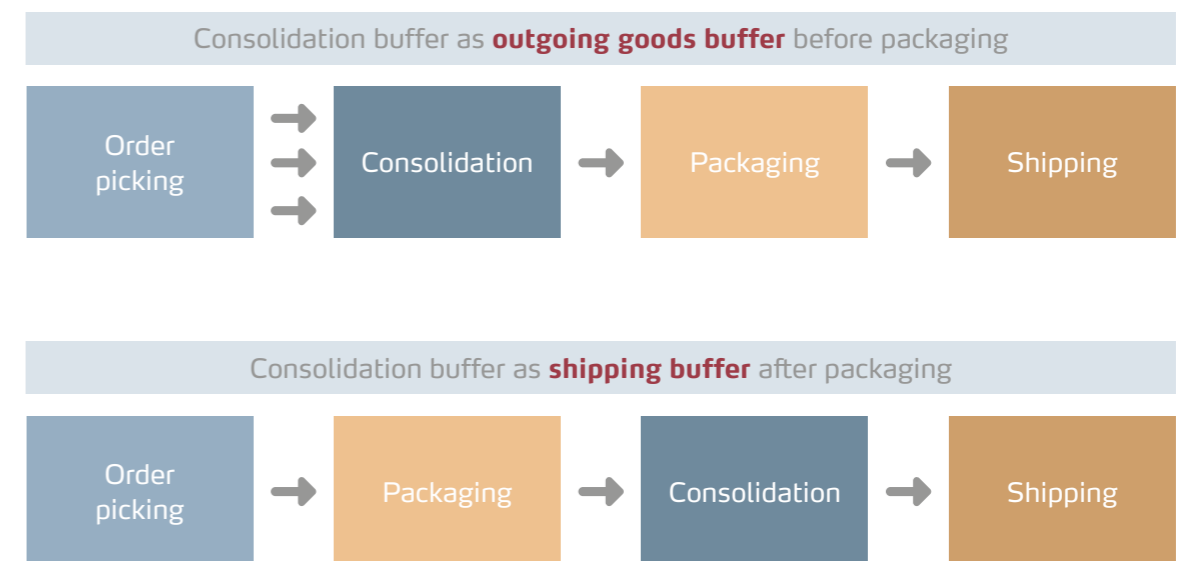
Why should you consider implementing automated order consolidation? What are the distinctions between semi-automated and fully automated order consolidation? How can you leverage Kardex Remstar systems, such as the Kardex Miniload-in-a-Box, as highly efficient, flexible, and affordable consolidation buffers? This guide provides the answers and explores how to execute automated order consolidation that increases productivity, saves floor space, and ensures sequenced, just-in-time delivery to alleviate packing and shipping bottlenecks.

What is order consolidation?

Put simply, order consolidation is the process of matching items for a single order picked from different storage locations or warehouse zones by combining them into one bin, tote, or pallet. A consolidation buffer temporarily stores partial orders before packing. This is known as an "outgoing goods buffer." Once all items needed to complete an order have been picked, the consolidation buffer retrieves them in the correct sequence and transports them to the packing area.

Consolidation buffers can also temporarily store completed and packed orders before shipping. Known as a "shipping buffer," this ensures that the orders are available as needed and in the correct order for optimal shipping, i.e. heavy items first.

Order consolidation buffer processes



Why automate order consolidation?

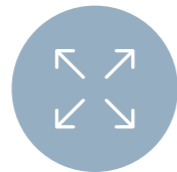
Implementing an automated consolidation buffer to manage the order consolidation process will increase productivity, save space, support packaging, and alleviate shipping bottlenecks.

Traditional order consolidation systems are comprised of static, shelf-based systems that take up an enormous amount of floor space and demand a high level of manual labor. A fully manual process is frequently error-prone, leading to delays and the return of incorrectly delivered products. By comparison, using the Kardex Miniload-in-a-Box as a base component for an automated order consolidation process **saves up to 80% of floor space**, speeds up processes, and increases accurate, on-time deliveries.

Some highly automated sortation systems have given automated order consolidation a reputation for being less cost-effective unless implemented in large-scale setups. However, by selecting the modular Kardex Miniload-in-a-Box as the foundation for an automated order consolidation system of any size, you can start small with a highly affordable solution and flexibly expand as needed.



Increase productivity by reducing search time for items that go together along with wait time



Save space with high storage capacity consolidation buffer in a small footprint



Optimize packaging and/or shipping due to sequenced just-in-time order bin delivery



Ensure transparent inventory management with intuitive connection to WMS etc.



A Kardex Miniload-in-a-Box serves as a simple consolidation buffer with three bin openings.



A more advanced order consolidation setup with conveyor bands automatically handling bin distribution.

Semi-automated or fully automated?

Choosing the correct order consolidation process depends on your warehouse's needs. While fully automated processes provide the highest level of efficiency and accuracy, semi-automated processes offer a balance of automation and manual work at a competitive price with the option to gradually implement a solution making the investment structure more manageable and staggered.

Semi-automated order consolidation

A semi-automated process combines manual and automated tasks to manage order consolidation in a cost-efficient and highly flexible manner. Examples of possible manual tasks include scanning bin license plates from the packing area and physically placing the bins into the buffer as directed by the software. Technologies such as conveyor bands will typically be leveraged for part of the process.

Fully automated order consolidation

A fully automated process requires no manual work. This process leverages technologies such as standard conveyor connections and/or automated guided vehicles (AGVs) combined with the Kardex Miniload-in-a-Box to streamline the entire order consolidation workflow, from picking to packing and, finally, shipping.

With Kardex Miniload-in-a-Box, you can easily configure a system to operate as a semi- or fully automated process.



Automated Guided Vehicles (AGVs)

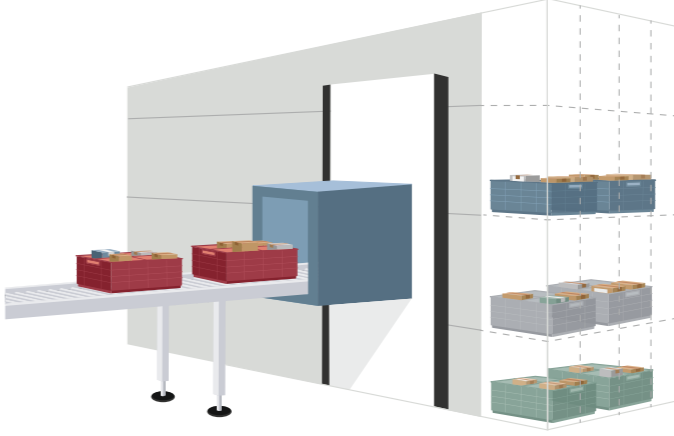
The Kardex Miniload-in-a-Box can easily work with AGVs, allowing for different levels of automation. There are two main types of bin AGVs used here. The first type is a simple bin AGV with a passive load handling device. This means it carries bins on a platform that doesn't move on its own. The bins are picked up or dropped off at a station, and they connect to the Kardex Miniload-in-a-Box through an intermediate conveyor belt.

The second type is a more advanced bin AGV with an active load handling device. This AGV has moving parts like belts, straps, or rollers that can pick up or place bins directly onto a conveyor belt. This makes the process faster and more efficient.

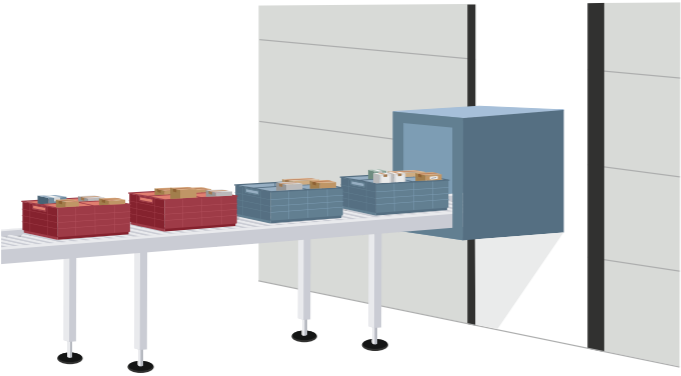
Semi-automated order consolidation with Kardex Miniload-in-a-Box – How does it work?



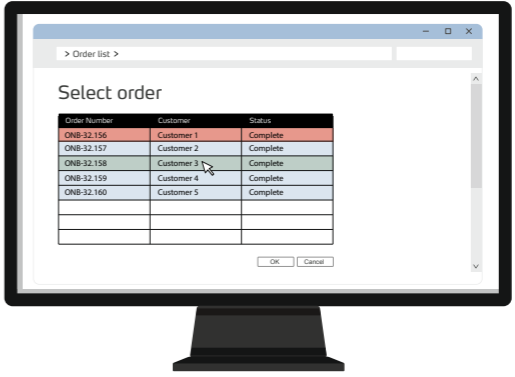
1 Packing of items picked from different zones into boxes (all boxes of the same color correspond to one customer order)



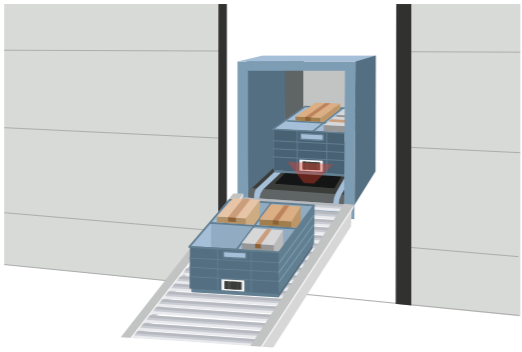
4 Boxes with missing items to complete an order arrive at the Kardex Miniload-in-a-Box



2 Sending the boxes to the Kardex Miniload-in-a-Box for storage until packing and shipping



5 After the JMIF software notifies the operator that the order is complete, the operator starts the retrieval process



3 Scanning of the boxes for an accurate inventory overview



6 Kardex Miniload-in-a-Box retrieves all boxes belonging to one order in the correct sequence

Kardex Miniload-in-a-Box

The Kardex Miniload-in-a-Box is a closed, dust-protected automatic storage system that stores either Kardex Vertical Buffer Modules (Kardex VBM) boxes or, upon request, standard European-sized bins and is similar in functionality to a miniload system. It provides the perfect basis as a consolidation buffer with high-density storage at an outstanding balance of cost, space, and productivity. Moreover, the Kardex Miniload-in-a-Box can be used in a semi- or fully automated process, supporting various order consolidation requirements. Customers can choose from several access opening types and customize the unit's dimensions up to 20 meters long and 12 meters high. This provides maximum flexibility in implementation planning and lets you quickly see a profitable return on investment.

The Kardex Miniload-in-a-Box is the perfect consolidation buffer



Kardex Java Machine Interface (Kardex JMIF) software

To complete the consolidation buffer system, the Kardex Miniload-in-a-Box can be combined with Kardex JMIF software, which connects to the warehouse host system (ERPs, WMSs, or WCSs), enabling the entire order consolidation process. Kardex JMIF manages the partial order bins within the Kardex Miniload-in-a-Box while the host system manages the orders.

All Kardex machines are web-enabled and come with the option to activate our **Kardex Connect** software, which offers remote support, centralized analytics, warehouse optimization, and more.



[i](#) Learn more about the Kardex Miniload-in-a-Box as a consolidation buffer here

Kardex storage accessories

Kardex VBM boxes are specially developed for the Kardex Miniload-in-a-Box. They measure 638 x 438 mm with the option to quickly and flexibly adapt using transverse and longitudinal dividers. These boxes make optimal use of available storage space. They are typically used when a warehouse selects the Kardex Miniload-in-a-Box as a standalone solution or in a semi-automated material flow.

When a warehouse selects an automated version of the buffer connecting with conveyor systems or AGVs, the Kardex Miniload-in-a-Box will be set up with **Euro bins** in 600 x 400 mm dimensions.



Success stories

Discover how Kardex clients have improved their order consolidation by implementing automated systems.

Tescoma, a premier Italian kitchen utensil manufacturer, optimized its warehouse operations at its 11,000-square-meter facility by integrating five Kardex Horizontal Carousels, a Kardex Shuttle, and a Kardex Miniload-in-a-Box from Kardex Remstar.

This solution significantly enhanced their picking speed and accuracy, maximizing storage efficiency and consolidating orders efficiently. The automated system handles around 500 boxes daily, improving order fulfillment speed and accuracy. Integrated with their ERP and WMS, the system manages approximately 15,500 orders annually, transforming Tescoma's logistics and storage capabilities.

 [Watch the video "Faster and more accurate picking"](#)

Hella Distribution GmbH, a leading German supplier of automotive parts, optimized its logistics operations at its warehouse using a Kardex Miniload-in-a-Box from Kardex Remstar. Standing six meters high, this solution streamlined their order consolidation process, significantly enhancing storage capacity and operational efficiency. The automated system transports cartons to the Kardex Miniload-in-a-Box for scanning and storage, where they wait shipment-ready.

This innovation reduced Hella's storage footprint by 80% and eliminated capacity constraints. Integrated with Hella's systems, the solution efficiently handles over 2,000 daily orders, improving delivery speeds and reducing manual labor.

 [Watch the video "Efficient consolidation of orders ready for delivery"](#)



Delaval, a sustainable leader in milking equipment and solutions for dairy farmers worldwide, optimized its warehouse operations at its northern Germany facility by integrating two Kardex Miniload-in-a-Box systems from Kardex Remstar. This solution significantly enhanced their picking speed and accuracy by routing boxes directly to one location and maximizing storage using full ceiling height.

The automated system transfers approximately 900 bins daily to the storage units, boosting order fulfillment speed and accuracy. Integrated with SAP, the system efficiently signals when orders are complete, conveying bins to six packing stations, where 1,000 to 1,500 parcels are packaged and shipped daily, transforming Delaval's logistics and storage capabilities.

 Watch the video "Automated buffer storage for efficient order consolidation"