



Slotting a VLM – A Step-by-step Guide

Best practices for slotting inventory in
a Kardex Shuttle Vertical Lift Module



Automation elevates slotting

Different systems, different strategies

A Kardex Shuttle Vertical Lift Module (VLM) can offer a warehouse incredible operational value, and the right slotting strategy plays a critical role in realizing that potential.

A VLM uses software like Kardex Power Pick to control inventory within a truly dynamic storage environment. Attempting to reproduce a traditional rack layout inside the machine can restrict that flexibility and leave valuable capacity and performance unrealized.

Understanding the differences between slotting strategies for a traditional storage system and a VLM is critical to maximizing throughput, storage density, and overall efficiency of the machine.

This guide provides a practical framework for slotting a VLM based on ground-level priorities for your specific warehouse operation, broken down into five steps.

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Leveraging these five best practices as part of a cohesive inventory organization strategy is the best first step to unlocking the true potential of a Kardex Shuttle VLM.

Step-by-step slotting guide

Step #1:

Define the work the VLM will perform

Before assigning inventory, establish precisely how the VLM will function within the broader warehouse operation. Start by defining which workflows the VLM will serve.

Determine where orders will originate, how operators will interact with the machine, where replenishment stock will come from, and what happens to inventory after it is retrieved. If several VLMs will operate as a pod, decide whether they will divide inventory by product family, support different workflows, or work in parallel to complete the same orders.

This decision establishes the balance between density and throughput. For example:

1. A facility managing many slow-moving SKUs may prioritize maximum storage density.
2. An operation with strict inventory-control requirements may incorporate barcode scans to verify products and locations during picking and putaway.
3. A warehouse storing high-value inventory may separate those products on designated trays and apply tighter access controls.

A factory using consumables for production may prioritize presenting materials in the precise sequence required by the production workflow.

These priorities are not mutually exclusive. Kardex Power Pick System can support different storage, verification, access, and sequencing rules within the same VLM solution, allowing the slotting strategy to accommodate multiple workflows and inventory requirements.

Step #2

Engineer tray architecture around the inventory

Grouping items with similar heights allows the machine to compress trays more efficiently.

A single tall product placed among much shorter parts can raise the profile of the entire tray and consume vertical capacity that could otherwise support additional storage.

- Bins, boxes, partitions, and dividers can create individual locations while preventing products from mixing or shifting.
- Heavy inventory must remain within tray-load limits and should be distributed appropriately.
- Frequently handled items need sufficient clearance for quick, ergonomic access, while fragile, regulated, or high-value products may require additional separation or control.

The Kardex Shuttle VLM combines careful tray design with dynamic slotting to make fuller use of the VLM's internal capacity.

Each time a loaded tray is returned, a height sensor measures its contents to select an appropriate storage position, allowing trays to be stored as close as one inch apart. Instead of reserving the same vertical clearance for every tray, the machine continually positions trays according to their actual loaded height.



Measure Inventory as it will actually be stored

Catalog dimensions do not always reflect the space a SKU will occupy inside the VLM. Measure products with their normal packaging, containers, labels, and required picking clearance. A compartment that fits the product exactly may still be too tight for an operator to retrieve it efficiently (or for the location to hold the intended stocking quantity).

Step #3

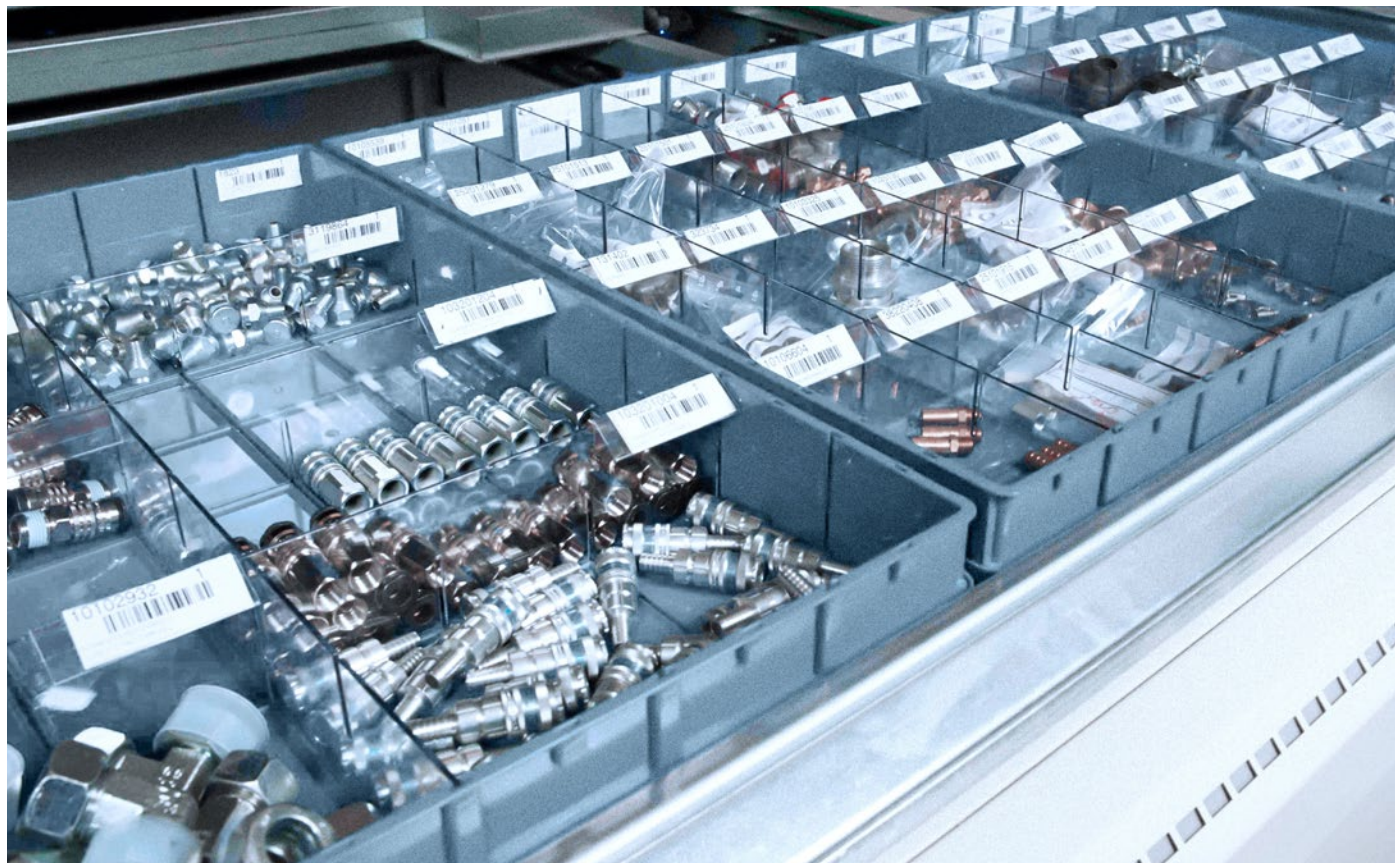
Slot for tray presentations and machine movement

Limiting movement of the automated mechanical lift inside the VLM promotes more efficient machine usage.

Remember: the machine must retrieve a tray, deliver it to the access opening, and return it before another tray can be presented. Here are some things to consider when deciding which SKUs go on which tray:

- **SKUs frequently requested together** should be considered as a group, as placing co-picked items on the same tray can allow an operator to complete several picks from one presentation rather than waiting for the machine to retrieve multiple trays.
- **High-velocity inventory** can be placed on trays stored closer to the access opening, limiting machine travel where the system configuration permits.
- The Kardex Shuttle VLM's **dual-tray delivery capability** extends this movement-reduction logic. While the operator works from one tray, the VLM automatically retrieves and stages the next tray for delivery, limiting idle time.

The same principles apply across multiple VLMs. Concentrating all high-demand inventory in one machine may create a bottleneck while neighboring units remain underused. Distributing orders or related SKU groups strategically can balance workloads and allow several machines to operate in parallel.



Step #4:

Plan replenishment and overflow into the slotting strategy

For each SKU, compare the capacity of its proposed location with its actual demand and replenishment frequency. The correct location's size reflects the balance between velocity, quantity per pick, available reserve stock, and the operation's ability to replenish.

An undersized compartment may achieve excellent storage density but necessitate repeated replenishment throughout a shift. A much larger compartment may reduce replenishment labor but consume valuable tray capacity that rarely contributes to picking.

Multiple and/or temporary locations can help resolve some of these tensions. For example:

1. A fast-moving SKU may use a primary pick location supported by a second location for reserve or overflow inventory.
2. Seasonal receipts and temporary increases in stock can be assigned to flexible locations rather than forcing a permanent tray redesign.
3. During initial the initial VLM loading process, temporary locations can help the operation begin using the VLM while actual demand and replenishment patterns are still being established.
4. Inventory levels can rise and fall without input from users. Unlike traditional shelving where users need to find larger storage locations or find an overstock location. Kardex software will automatically provide empty locations for put aways when stock levels are high, and those locations can be used for other parts when stock levels are low.

Finally, determine whether replenishment will occur during dedicated windows, alongside active picking, or through a separate access point or machine.



Pro Tip

Size pick locations around the replenishment window

Avoid sizing every compartment to hold the maximum quantity a SKU might reach. Instead, determine how much inventory the location must carry between planned replenishment periods. A primary pick location can support normal demand while reserve or overflow inventory is maintained separately, preserving accessible tray capacity without forcing constant refills.

Step #5:

Validate the slotting strategy under live operating conditions

As your ASRS system builds a track record, live use will reveal how orders, employees, replenishment activity, and machine movement interact in practice.

Validation processes should review factors including:

- How many tray presentations are required per order.
- Where machine travel is concentrated.
- How frequently primary locations require replenishment.
- Whether high-activity trays are creating delays.
- Pick and error rates.
- Machine utilization, available capacity, and the distribution of work across multiple VLMs.

From here, subsequent changes can be carefully targeted to address bottlenecks and adjust to new inventory patterns.



Let the system establish a meaningful baseline

The first days after go-live may reflect training, initial inventory adjustments, and unfamiliar workflows rather than normal operating demand. Allow the VLM to collect a representative period of transaction data before making broad slotting changes. Immediate corrections may be appropriate for clear physical or workflow problems, while velocity, affinity, and replenishment decisions should be based on a stable pattern of use.





Slotting should be dynamic and continuous

Optimal VLM slotting requires a continuous series of interrelated physical, operational, and digital decisions to remain aligned from planning through go-live. Kardex's Slotting Services are here to help you on every step of that journey.

Onsite evaluation and planning: Specialists assess the inventory, workflow, facility, and project requirements before developing an implementation plan.

Flexible implementation support: Customers can lead the move themselves, share responsibilities with the Kardex team, or have our experts take the lead on implementation.

Physical and digital configuration: Services can include tray, divider, and section setup; inventory transfer; software loading; and quantity and location verification.

Training and ongoing support: Our team can train operators, optimize the system after the move, and provide physical inventory services as requirements change.

If you are planning a new VLM installation or expanding your existing one, Kardex Remstar can help you navigate developing your slotting strategy.

 [Click here to get started.](#)