

AN EDUCATIONAL SERIES DEVELOPED BY HK SYSTEMS

A Roadmap For:

Deploying An Automated Warehouse

APPROPRIATE APPLICATION OF AUTOMATED STORAGE AND RETRIEVAL

Since the late 1960's, Automated Storage and Retrieval Systems (AS/RS) have yielded significant savings for their owners. . . when applied appropriately. In general, AS/RS involves the use of 3-axis, floor running automated Storage & Retrieval Machines (SRMs) to put away and extract materials from a stationary rack system, instead of human-based alternatives such as fork trucks. Though not inexpensive, they never call in sick, hung over or late, they work 24x7 without complaint and never make mistakes.



If you are considering automating your facility, the following roadmap will help you decide if AS/RS is right for you and if so, how to proceed effectively.

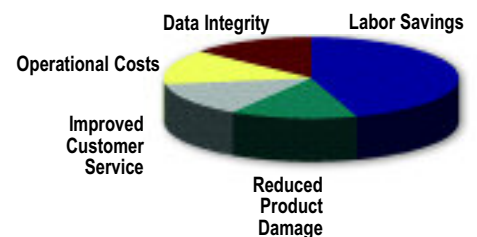
STEP 1: JUSTIFICATION

AS/RS technology makes sense in many but not all cases. The first step is to quantify the return on your investment. The 5 typical categories of tangible justification are:

- **Operational Savings** – This includes the reduction or elimination of labor, increased product integrity due to the precision of movement and facility savings in terms of higher density, lower utility costs and smaller footprints.
- **Strategic Advantages** – AS/RS supports the principles of Lean Distribution and offers business advantages that improve visibility and efficiency throughout the supply chain.
- **Safety** – Automation is highly productive in freezer, cooler or hazardous environments; producing consistent performance without the personnel risks.
- **Functional Benefits** – Computer-controlled systems offer 100% inventory accuracy, intelligent slotting of goods, JIT production sequencing, time-controlled storage and more.
- **Security** – In applications involving high value or government-regulated materials, both physical and logical security are inherent in a secure, computer-driven AS/RS.

Every application and reward is different, however, the chart below indicates the typical spread of return to AS/RS owners.

A comprehensive ROI analysis tool for you to compare conventional to automated technologies using your data can be found at www.hksystems.com/resources.



STEP 2: DATA ANALYSIS & DESIGN

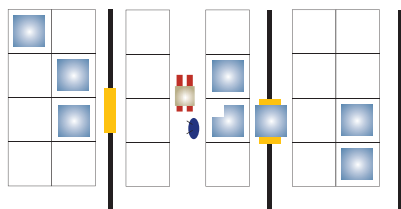
The operating data of your business will drive the equipment selection and system layout. For example:

DATA ELEMENT	DESIGN FACTOR	PROCESS
Material Size & Condition	SRM selection, rack configuration	Carefully profile all of your load sizes, heights, and weights. Where possible, group materials by size based on foreseeable projections.
Number Of Storage Locations	Footprint, height	Determine the amount of storage that you require. Take into account your internal storage, outside storage and growth projections.
Hourly Activity Within The Facility	Number of aisles, machines and height-to-length ratio	Determine the movement of the product, consider turns, receiving, shipping, picking, replenishment and work in process movements.
SKU Volume & Mix	Rack design, density, selectivity, rack depth	Look at your inventory in detail to understand the quantities and mix of product that you typically store.
Operating Environment	Environmental control, isolation barriers, HVAC	Evaluate the temperatures, humidity and the number of products to be stored in these unique environments.
Building Constraints	Amount of storage, type of equipment and ultimately the throughput of a system	Determine regional constraints regarding the length, width, height, wind shear, snow load and seismic data.
Business Volatility	Layout, container selection, rack dimensions, interfaces, etc.	Determine if your business model is dynamic in terms of flow, volume, product or order profile, design for flexibility.
Product Sequencing	Density, selection of storage medium	Evaluate if your business and material require strict First-in-first-out (FIFO) rotation, flexible FIFO or FILO.

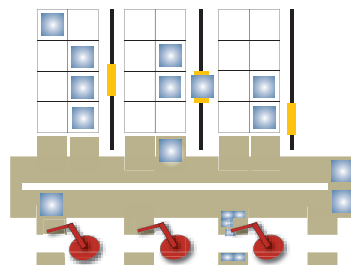
STEP 3: INTEGRATION

The value of AS/RS lies in integrating equipment and control into your material flow strategy. This involves selecting an input/output interface technology and balancing system throughput with your sources of supply and demand. Several alternatives for interfacing to the automation include:

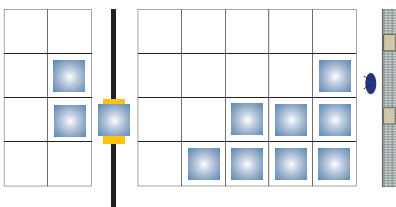
Pick-To-Pallet In Pick Tunnel With Dynamic Pick Face Replenishment



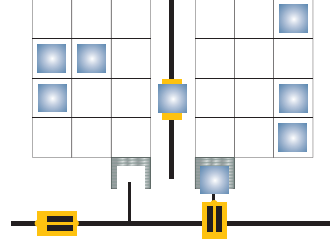
Robotic Mixed Pallet Building With Conveyor Feed From AS/RS



Pick-To-Belt From Deep Lane Pallet AS/RS



AGV Delivery Of WIP To Production Cells



STEP 4: CULTURAL ADAPTATION

If justified, properly designed and integrated, AS/RS can provide many years of high return on your investment. However, owning and operating automation brings several responsibilities:

- **Safety** – Though such systems are designed with compliant safety features, owners and operators must subscribe to safe practices in operation and maintenance.
- **Commitment** – Harvesting the rewards of automation requires a trust in equipment repeatability and data integrity, often uncommon with typical manual alternatives.
- **Ownership** – Like any technological asset, electromechanical systems require regular maintenance and periodic upgrade to maintain their level of performance and reliability.

A SINGLE SOURCE SOLUTION FOR AS/RS TECHNOLOGY

As the #1 North American supplier of AS/RS with over 500 installations, HK Systems leads in experience and innovation. Having applied AS/RS in most every industry and environment, we offer a methodical process to evaluate your business, concept solutions and, with you, quantify the costs and reward of automation for your unique challenges.



REALIZE MAXIMUM EXPERIENCE AND MINIMAL RISK WITH SOLUTIONS DELIVERED BY HK SYSTEMS

HK Systems is the most experienced automated material handling equipment and software total solutions provider. Our products, engineered and manufactured in the USA, synchronize material flow in a multitude of environments, delivering high efficiencies, speed and reliability.

Our flexible solutions improve operational performance with superior integration services, quality material handling equipment, software applications and premier support services.

Discover How.
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