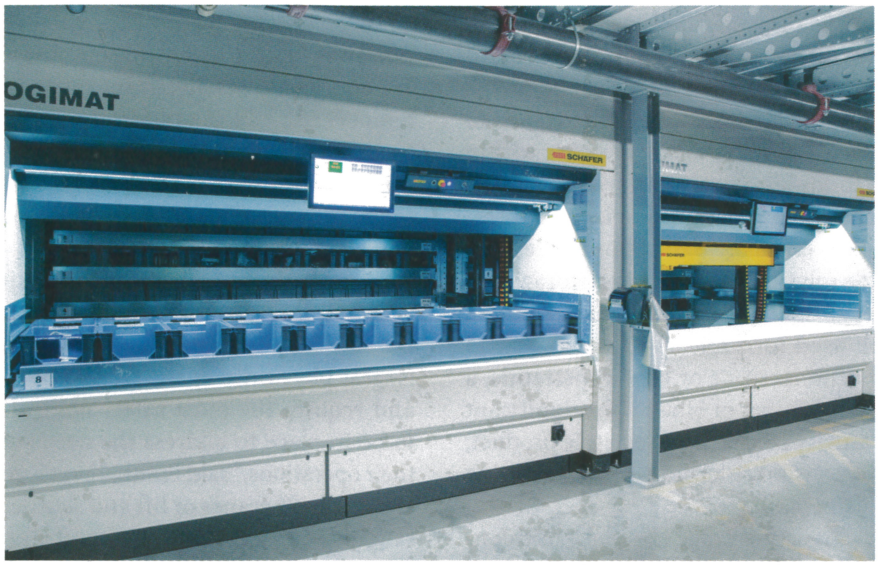
AS/RS: Safety and Ease of Use in Automated Storage and Retrieval Systems

BY JEAN FEINGOLD

Automated Storage and Retrieval Systems (AS/RS) combine equipment and controls to handle, store and retrieve materials as needed with precision, accuracy and speed using a defined degree of automation. Systems can range from relatively simple manually controlled systems operating in small storage structures to larger, computer-controlled storage/retrieval systems totally integrated into a manufacturing and distribution process.

Members of MHI's Automated Storage/Retrieval Systems (ASRS) group are the Industry's leading suppliers of these systems. Their systems are used worldwide in virtually every major manufacturing and distribution sector.



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The SSI SCHAEFER LOGIMAT Vertical Lift Module

AS/RS overview

AS/RS handle "robotic automated storage and retrieval of products with minimal human intervention," said Gary Frank of MHI member Westfalia Technologies, Inc. They can handle pallet loads, cases, boxes or individual items.

Generically speaking, AS/RS refers to several computer-controlled methods for automatically depositing and retrieving loads to and from defined storage locations. Within an AS/RS environment one could find one or more of the following technologies: horizontal carousels, vertical carousels, vertical lift modules, and fixed aisle storage and retrieval systems, plus others.

Training needed to use robotic and computer driven AS/RS depends on the worker's duties. System operators must learn how to operate the equipment. Technical knowledge of electronics and equipment maintenance is required for the maintenance personnel. The AS/RS supplier will train personnel specifically on their systems. "Material handlers/pickers need to understand basic system operation and safety criteria, but do not require any specialized technical training to support the equipment," Frank said. "Data processing personnel are typically remote to the system and do not interface physically with it."

"Systems are protected with controlled access to the equipment and only trained authorized personnel are able to enter the robotic equipment area to correct faults or maintain the equipment," said Frank. "These systems are extremely safe due to this controlled access. Safeguards are in place to restrict and keep unauthorized personnel from entering these systems. Equipment will shut down if a person enters an area where the equipment is operating. All personnel working with the system will be trained on its associated operation and safety." Operator training for all automated systems is typically done on-site.

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User picking from SSI SCHAEFER LOGIMAT Vertical Lift Module

Three specific AS/RS technologies

Vertical lift modules, or VLMs, are similar to oversized drawer cabinets. "These units offer the utmost security since users must login to gain access to inventory items," said Sharon Wahrmund of MHI member Schaefer Systems International, Inc. "Audit controls and user rights access make this storage feature a perfect pick for high-value items. VLMs are a great way to introduce semi-automation into a fulfillment process. They offer high storage density for small parts, which can save valuable floor space." They can also include software to manage inventory or connect to the customer's ERP or WMS for full integration into their operations."

VLMs are relatively easy to use, with large screens and user friendly intuitive

interfaces. After training from the supplier's technician during initial installation and setup, Wahrmund recommends having experienced users train new employees with backup help from the manufacturer as needed.

Safety features built into VLMs include light curtains to prevent access during operation and emergency stops. Buyers can add more safety with additional features.

Cube storage systems use robots to store and retrieve storage bins within a modular aluminum grid structure. Their dense design provides an ultra-space-efficient, high performance, flexible solution for small parts storage and single item picking. These systems can be used for projects with brownfield locations, space or time constraints, a high number of bins/SKUs, significant security concerns or sensitive product, high-visibility locations or fast growing businesses.

"In cube storage systems, radio controlled robots collect the required storage bins from atop the grid and present them at integrated delivery ports for operator access, substantially increasing picking efficiency and throughput," said Mark Hasler of MHI member AutoStore. These products have five standard modules: Robots, Grid, Bins, Ports and Controller.

"Bins are presented to operators at an ergonomic height at picking or put-away ports," said Hasler. Ports are equipped with hatch sensors that temporarily halt operation if tripped by hands or by product blocking port movement. Tailored to a client's operations, the user-friendly system can be easily expanded or modified.

Fixed aisle systems consist of unit load and mini-load AS/RS configurations. "These systems are typically the largest physically of the technologies and require the most safety controls to be in place to address the needs of their operations," said Frank. "Unit load systems have cranes or lift and shuttles ranging in height from 20- to over 100-feet tall and handle products typically on a variety of pallets like GMA, CHEP and PECO. These systems are fenced off with controlled access by maintenance people only."

Mini-load systems, which also have cranes or lift and shuttles, handle products on trays, directly with cases or individual pieces inside storage bins. Training time for these systems' operators depends on the size of the system.

Safety built-in

Automated systems are safe because operators never interact directly with the moving robotics. Human interface to the automation is protected with gates, sensors or light curtains.

For all AS/RS technologies, manufacturers provide safety training to purchasers on how the equipment operates and about the many safeguards in place. These systems have excellent safety records because of the safeguards provided, the user training and because their robotic nature means they have limited interaction with people.

To learn more, visit mhi.org/as-rs.