

# Smart Warehouses, Smarter Productivity

## Why Automation is the Next Generation in Effective Warehouse Management

External competition as well as increased internal pressures to be lean and improve productivity and the bottom line has caused many companies to reevaluate their warehouse operations. Employing the strategies of yesterday does not translate into positive results for tomorrow. If you want to improve efficiency and lower costs, automation is the answer.

Increasing numbers of companies with the insight and resources are fully automating their warehouse operations. By embracing technology, those companies are beginning to reap measurable benefits in terms of reduced operating costs and increased productivity. By taking the core functions of a warehouse operation and automating it, the warehouse, as a whole, has transformed. For all intents and purposes, warehouses have become – smarter.

### Evolution of a Concept

The term “Smart Warehouse” has been tossed around for the past few years and has been used to represent everything from the use of RFID tags and software to quality assurance.

But a true Smart Warehouse is more than a buzzword or manufacturing jargon. When implemented effectively, it is a systematic strategy that can take a traditional operation to the next level.

A Smart Warehouse implies the total integration of automated technology to carry out day-to-day operations. The components of a Smart Warehouse may include the utilization of conveyor systems, Automatic Guided Vehicles (AGVs), Automatic Trailer Loading (ATL) vehicles, Automatic Guided Carts (AGCs), Automated Storage and Retrieval Systems (AS/RS), and a Warehouse Management System (WMS). When used in a concerted effort, these ingredients make for a highly productive warehouse.

In North America, a typical warehouse operation possesses the following characteristics: it is normally privately run; is less than 250,000 sq. ft. in size; end consumers or another manufacturer are its primary customer; and its most common units handled are pallets with rack storage serving as the primary housing

method. According to the First Annual Warehouses Trend Survey conducted by RBI Research, Gross & Associates in 2006, warehouse managers indicated that their chief goals and concerns centered on increasing customer satisfaction, which included delivery of on-time, undamaged and accurate orders, and reducing costs.

### Measurable Benefits

A company taking the necessary steps to invest in and develop its warehouse and distribution centers' infrastructures now, ultimately, saves money later. A Smart Warehouse operation will help a warehouse manager address the goals of improving customer satisfaction and reducing operating costs. Smart Warehouses adhere to the basic principles of “lean” warehousing while creating a safer work environment by cutting down on the probability of human error.

Smart Warehouses allow a company to not only achieve its desired results, but to add reliability, dependability and, more importantly, predictability to the process. The Smart Warehouse

then allows for a “lights out” 24/7 operation if necessary. Companies that used to depend upon manpower can reassign key personnel to other areas where needed.

For more than a decade, material handling providers have been developing new technology and systems to automate time consuming and costly operations typically requiring manpower. As a global leader in the materials handling industry, Jervis B. Webb Company has invested the necessary resources to produce all the components for a fully functional Smart Warehouse system. Additionally, Webb provides the blueprint for making those pieces work in an integrated and seamless operation.

## Smart Technology

### SmartCart® AGCs

The SmartCart Automatic Guided Cart is an extremely low-cost, magnetic tape-guided Automatic Guided Vehicle that can transport finished pallets from stretch wrapping operations to AS/RS, rack staging or a floor staging area adjacent to the docks.

SmartCart AGCs typically cost much less than a conventional AGV and can be utilized as an alternative to performing similar work. It is extremely flexible because all that is needed to change the path is relocating the tape that is attached to the surface of the warehouse floor and modifying an easy-to-use Windows-based software called Cart Tools®, which allows the customer to pro-

gram the guidepath.

Furthermore, a SmartCart AGC is perfect for transporting materials from production to the warehouse. It has the ability to deliver pallets onto a powered or gravity buffer conveyor. Once handed off, the pallet may then be taken into high-rise storage, or AS/RS to rack storage, or to the dock for trailer loading.

### SmartLoader® Automatic Trailer Loading (ATL) Vehicle

The SmartLoader Automatic Trailer Loading vehicle is able to stack pallets accurately and efficiently. In fact, the unmanned SmartLoader, which is directed by a Vehicle System Manager (VSM™), demonstrates a higher degree of accuracy than traditional forklift operations.

Deep lane storage of finished goods on pallets placed by SmartLoader is recognizably one of the most effective warehouse solutions. Because of SmartLoader's flexibility, it does not depend on fixed, rail-guided AS/RS machines that are limited to a single aisle. The SmartLoader is a free-ranging vehicle that uses either inertial or laser guidance to travel within a warehouse.

Additionally, SmartLoader is capable of delivering finished pallets directly into conventional, over-the-road trailers. Even more remarkable, SmartLoader doesn't require any trailer or plate modifications and it automatically adapts to trailer skew. This makes the SmartLoader possibly the

most powerful tool ever created for the warehouse. Because of its unique combination of stacking and loading skills, it is gaining wide attention among companies looking to improve their productivity and efficiency.

Warehouse Management System software can be integrated with the SmartLoader VSM. Both the SmartCart and the SmartLoader systems are easy to install and allow for additional vehicles to be added as demand increases. In addition both automated vehicles can operate separately or as companions to one another.

### Conveyors

Conveyors are at the heart of thousands of manufacturing, warehousing and distribution operations, providing unmatched reliability in the most demanding environments. They are used for point-to-point movement of pallets and containers.

Offerings such as the gravity roller conveyor are widely used in unit load handling systems because of their simplicity, low unit cost and ease of maintenance. Gravity roller conveyors can be applied in the form of level push-lines or graded lines using the force of gravity.

The modular-designed pallet accumulation conveyor consists of separate powered zones of chain-driven live roller conveyor powered through a mechanical clutch. This allows zero pressure accumulation of heavy, bulky, unitized loads.

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The use of individual zones permits loads to advance to the farthest downstream empty zone. The clutch-controlled zone allows the individual release of the loads at the discharge end and indexing forward of the accumulated loads.

The pallet accumulator delivers no impact and continuous transport of palletized loads. Conveyor systems can be integrated with SmartCart AGCs.

### Automated Storage and Retrieval System (AS/RS)

AS/RS automatically deposits and retrieves loads from defined storage locations. AS/RS improves the efficiency of transporting, buffering and sequencing of standard and non-standard loads. It eliminates the excessive and repetitive handling of material, increases productivity, decreases inventory, increases the productivity capacity of existing floor space and reduces product loss.

AS/RS systems can be built around rack systems, containers and machines to optimize warehouse space.

### Rack Systems

If density is an issue, but not selectivity, then a rack system may be the right choice. Rack systems are more cost-effective and are easier to reconfigure than AS/RS. Racks allow higher stacking than floor storage and provide increased storage.

Drive-in or drive-through rack can be designed to allow two pallets to be handled at a time by forklifts (cutting labor in half) or SmartLoader

Automatic Trailer Loading vehicles (doubling system throughput). This rack concept allows for the most density for the dollar.

Another rack system is pallet flow, which provides the maximum density and can also be accessed by SmartLoader ATL vehicles.

### Looking Ahead

As technology improves, new automated products are being introduced, giving warehouse managers more options than ever before. Conducting the necessary research and selecting the appropriate automation for a company's needs will ultimately result in improved accuracy, speed and productivity.

With the advent of Smart Warehouses, the future of warehouse operations looks very promising.