PYRAMID

SOLUTIONS

Pyramid Director WES

Pyramid Controller Software Suite

INSTALLATION SCOPE

Pyramid Director WES interfaces with the WMS via a DBMS to control and manage processes in real-time, including:

- Waving: Wave optimization and build based on rules and algorithms
- Picking: Wave-based RF terminal to tote
- Wave Management: Routing and execution throughout DC for multi-line and single-line orders
- Routing: Auto sort picked totes by wave to 60 pack-out pods via pop-up wheel sorter and 90° transfer sorters
- Multi-Line Order Processing: Light-directed sorting and packing
- Finished Packaging: Auto sortation of shipping cartons to workstations according by order requirements
- Auto-Print/Apply: Shipping labels
- Single-Line Order Processing: Sort by carrier/service level via Intralox sorter
- Shipping: Sort ship-ready cartons across high-speed slat sorte by carrier/service

pyramidcontrols.com

Sports Merchandise, DTC Retailer.

Pyramid outfits officially-licensed college and pro sports gear e-commerce retailer's fulfillment DC with highly customized warehouse execution system.

THE APPLICATION

Thanks to rapid sales growth and the addition of new product lines, a leading retailer of officially licensed college and professional sports merchandise (and a Top 50 Internet Retailer) needed to significantly expand and modernize the order fulfillment infrastructure and capacity of their new distribution center (DC) for direct-to-consumer (DTC) shipments.

THE CHALLENGE

Implement a new fulfillment center and re-engineer all distribution processes to incorporate:

- The latest advances and best practices in order fulfillment.
- State-of-the-art material handling equipment (MHE).
- Fully integrate home-grown warehouse management system (WMS).

Because of serious limitations in the existing WMS and the company's reluctance to further invest in expanding its functionality, Pyramid's warehouse execution system—Director WES—was chosen, not only to integrate all DC processes and MHE with the WMS, but also because it could incorporate a significant amount of functionality typically associated with a WMS.

This customization benefits the company through:

- Full order fulfillment, warehouse and inventory management functionality.
- Significantly reduced initial and recurrent system implementation costs.
- An accelerated implementation timeline of five months.
- A platform that is infinitely scalable in function and performance as the business continues to grow. The company routinely migrates additional WMS functionality to Director WES.

SOLUTION
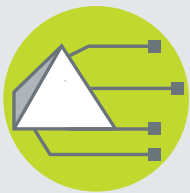
PYRAMID DIRECTOR WES
WAREHOUSE EXECUTION SYSTEM

PYRAMID CONTROLLER SOFTWARE SUITE
OF CONTROL HARDWARE AND PRE-ENGINEERED SOFTWARE FOR MATERIAL HANDLING EQUIPMENT

KEY FUNCTIONAL HIGHLIGHTS

Complete integration with the customer's home-grown WMS through the use of a common, host-based database management system (DBMS) where information is shared. Though unconventional, this setup lets Director WES selectively harvest the data it needs to drive fulfillment without requiring custom WMS interfaces. In turn, Director WES deposits inventory, location and status updates in the DBMS, allowing inventory and customer orders to be managed by the WMS and throughout fulfillment. All inventory receipt, reserve storage and replenishment of the forward pick area is directed by the WMS.
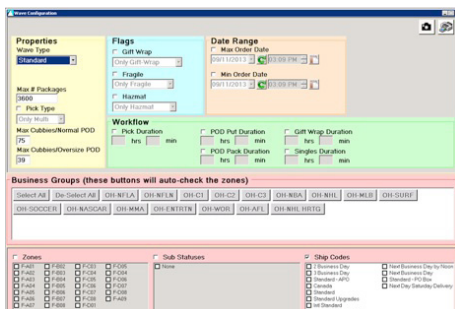
Optimized Order Handling
Pyramid Director WES supports wave order optimization, build and execution.

PYRAMID DIRECTOR WES

DIRECTOR WES provides a comprehensive suite of simple, easy-to-use graphical screens for management and users, as well as a central control dashboard. All screens are customized to provide:

1. Real-time visibility into all aspects of the DC's operational activity.
2. The ability to directly control the flow of inventory through the DC by wave, tote, case and more.

Views include:

- Process status performance metrics.
- Exception reporting.
- Inventory status and location.
- MHE status and performance.
- Communications status and statistics configurable security.
- Parametric and diagnostic portals.
- Up-to-the-minute information about vital aspects of the DC.

Director WES's human machine interface (HMI) has color graphics for diagnostics and KPI monitoring for all package conveyor and sortation MHE within the DC. The graphics give complete visibility of all MHE operation—including conveyor and sorter performance, status, alarms and more—all monitored continuously by the WES. Reporting includes both real-time and cumulative statistics for proactive maintenance, maximum uptime across all related MHE and prompt reporting, diagnosis and correction of any issues that may arise.

KEY FUNCTIONAL HIGHLIGHTS
(continued from page 2)

Order Handling
As customer orders become available at the WMS, they are selectively drawn down by Director WES according to specific, company-determined rules and inventory/order optimization algorithms. Orders are optimized by Director WES to maximize pick and pack efficiencies. Next, Director WES builds and schedules executable waves.

Picking
As waves become available for picking, operators pick by wave/stock keeping unit (SKU) from shelving utilizing radio frequency (RF) terminals and multi-tote (one wave per tote) pick carts. Articles picked by SKU are placed individually in a tote. To maximize efficiencies, multiple waves are picked concurrently. Director WES directs all planning, assignment and execution of the picks for each operator.

Packing
When tote picks are completed, they are released from the picking area and transported by conveyor to the routing sorter. The routing sorter—a high speed, pop-up wheel belt sorter—operates under the direct, real-time control of Pyramid's Induct Controller and Case Sort Controller. Totes are automatically inducted and scanned, with routing supervised by Director WES to:

1. Route all multi-line orders to an array of five pack-out pod sorters (based upon wave). All totes for a specific wave route to a single pack-out pod for consolidation and subsequent processing.
2. All single line orders are routed to the singles processing workstation area.

Operations personnel use Director WES and its put-to-light (sort to order) and pack-to-light (pack completed order) automated features to process customer orders.

PYRAMID CONTROLLER SOFTWARE SUITE
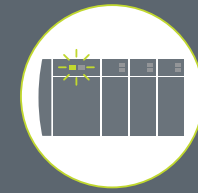
The Pyramid Controller family of software products features an extensive suite of pre-engineered, robust, reliable and time-tested programmable logic controller (PLC)-based applications. The Controller suite incorporates our extensive experience implementing controls for a broad array of different material handling technologies, OEMs and customer applications. Pyramid Controller solutions include:

CASE SORT CONTROLLER
Controls sorting of cases, cartons, totes and other units over a broad range of MHE technologies including slat/shoe, pop-up wheel, swivel wheel, transfer and more.

LOOP SORT CONTROLLER
Controls sorting of units or other individual articles of inventory over more advanced sorting technologies, such as cross-belt, tilt-tray, bombay and others.

INDUCT CONTROLLER
Controls the automatic identification (auto-ID) of unitized product or other inventory units and their induction onto sorters, emphasizing optimal sorting accuracy and throughput.

MERGE CONTROLLER
Controls complex, high speed merging of cases, cartons, totes and other units from multiple sources, including feather, zipper, slug-build-and-release, saw-tooth and other forms of advanced merge technology.

Pyramid Director WES and Case Sort Controller automatically route articles in totes picked by wave to an array of automated pack-out pods.

KEY FUNCTIONAL HIGHLIGHTS
(continued from page 3)

Packing

When a multi-line tote arrives at a pack-out pod sorter via 90° transfer, it is automatically scanned, routed and sorted to its target pack-out pod under the real-time control of Pyramid's Case Sort Controller and Director WES.

Packing waves are automatically generated and scheduled by the Director WES, assigning one wave to one pack-out pod to be processed at one time by a single DC associate (approximately one hour of work). The progress of each wave's arrival to a pack-out pod is continuously tracked by Director WES. Director WES indicates to associates when the wave is sufficiently complete to be processed at the pack-pod. Up-to-the-minute exception reporting alerts associates to any exceptions by wave and by customer order.

At pack-out pods, associates scan each tote. This prompts Director WES to direct a put at one of 80 fixed shelf put positions (cubbies), each equipped with a light-directed display. Each cubby is a single order to be packed. The lights indicate the item quantity to be put by SKU. The operator performs and confirms each put by pressing an illuminated pushbutton.

As customer orders are completed by cubby, a Director WES display on the other side of the shelving fixtures indicates which location (customer order) is to be packed next. A packer removes the order from the cubby and confirms the packed order via RF terminal. The packing process continues as the operator scans a shipping carton license plate number (LPN), places the order's item(s) into the carton, and then transfers the shipping carton to a conveyor. The conveyor transports completed shipping cartons to the dunnage sorter.

KEY FUNCTIONAL HIGHLIGHTS
(continued from page 4)

Dunnage

The dunnage sorter (shoe/slat MHE technology) sorts the shipping cartons to an array of diverts based upon customer packing requirements (regular, fragile, gift wrap and more). All dunnage sorter control is performed in real-time by Pyramid's Induct Controller and Case Sort Controller under the supervision of Director WES. Each divert lane transports the shipping cartons to a dedicated workstation. There, an operator scans the carton, prompting Director WES to print the packing list and invoice. The operator inserts these and related collateral into the shipping carton. Upon completion, the WMS downloads shipping label printing requirements to Director WES and the cartons are transported via conveyor to the shipping label print/apply operation.

Monitoring

Director WES provides users a simple, powerful interface for monitoring wave status and exception reporting.

Single Line Orders

From picking, Director WCS routes single line orders to the singles processing area. Here, single line orders are processed by the WMS, and packed (with the invoice and collateral, plus shipping label applied). As bags and cartons are completed, they are transported via belt conveyor to a chute leading to a workstation.

An operator positions the ship ready packages onto a specialized Intralox transfer sorter (controlled by a modified version of Pyramid's Case Sort Controller). Packages are sorted into multiple chutes per Director WES according to carrier (UPS, FedEx, USPS and others) and service level. Director WES updates the WMS DBMS with sorting activity, and manifesting occurs at the WMS level.

Auto-Print/Apply Labeling

Multi-line orders are transported to the shipping label print/apply operation. Cartons route to one of four label print/apply lines depending upon availability and accumulation. Each line has two print/apply machines. Cartons are:

- Inducted per governing rate and automatically identified inbound.
- Tracked continuously to their print/apply position.
- Auto-labeled on-the-fly by a print/apply machine.
- Scanned and verified outbound for 100% accuracy.

Shipping label print/apply operations are controlled by Pyramid's Auto-Print/Apply Controller, with all shipping data, templates and printing driven by Director WES.

Shipping

From the shipping label print/apply operation, ready-to-ship cartons are conveyed to the shipping sorter. Upon departing the print/apply operation, shipping cartons are processed through a high-speed merge which inducts them into the shipping sorter (high-speed slat/shoe) under the direct control of Pyramid's Merge Controller, Induct Controller and Case Sort Controller. Cartons are scanned and routed by Director WES to their required divert

Software and Controls for Maximum Distribution and Fulfillment Center Performance.

PYRAMID

Pyramid, a Matthews Automation Solutions fulfillment systems brand, provides Warehouse Control System (WCS) and Warehouse Execution System (WES) solutions that perfectly synchronize a wide array of material handling systems including motor-driven roller (MDR) conveyor, case sorters including sliding shoe, automated storage and retrieval systems (AS/RS) and more. Pyramid's turnkey loop sorter control solutions maximize performance and reduce downtime for new tilt-tray, bomb-bay and cross-belt sorters. We also revitalize existing loop sorter productivity with advanced system re-control solutions.

Fully integrated with your WMS or ERP, our controls optimize wave creation logic and paperless pick/sort systems such as pick-to-light and put walls. Along with order finishing system controls for automated bagging, boxing and packing slip/marketing collateral document insertion, Pyramid empowers your distribution center's transformation into a successful omnichannel fulfillment operation.

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