

APPLICATION BRIEF

LEADING SHOE AND ACCESSORY RETAILER

SOLUTIONS

Pyramid Director WES

Pyramid Controller Software Suite

INSTALLATION SCOPE

Pyramid Director WES integrates with WMS and the Pyramid Controller Series (control hardware and software) to supervise and direct:

- Receiving: Auto check-in and sorting
- Staging: Pallet put-to-light by wave
- Picking: Case pick-to-light by wave
- Case Routing: Front-to-back, by wave
- Inventory Control: Cases and cartons
- Off-Conveyor Operations: RF terminal support
- Shipping Label Auto-Print/Apply: GS-1 compliant labels across multiple carriers at rate of 100cpm over 2 lines
- Shipping: High speed sorting of ship ready cartons to multiple docks
- Packing: 2 cross-belt sorters
- System Integration: Across cross-belt, slat and pop-up wheel sorters
- Monitoring and Reporting: Complete visibility/control of all operations, tools to expedite inventory tracking; graphic user interface monitors MHE operations and real-time performance



Leading Shoe & Accessory Retailer.

Pyramid implements multi-phase revamp of store-level DC, replacing outdated controls with customized WES.

THE APPLICATION

A leading shoe and accessory retailer needed to update and expand its store fulfillment distribution center (DC) infrastructure in order to:

- Meet the demands of the business relative to current and forecasted rate of growth (relative to sales, stores, unit volumes and other key metrics).
- Implement new business and DC processes to better serve the changing business needs.
- Increase productivity and efficiency throughout all DC operations.
- Significantly enhance inventory visibility across all DC processes and implement more precise control methods to enable the DC to be more responsive to the needs of stores.
- Eliminate serious, ongoing service and support problems associated with technical, commercial and operational obsolescence of existing DC equipment and systems.

THE CHALLENGE

Perform a complex, multi-phase renovation of the company's primary retail store fulfillment DC.

Phase 1 included:

- Update and/or replace existing, obsolete and patchwork material handling equipment (MHE), controls and infrastructure.

THE CHALLENGE

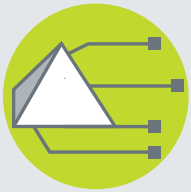
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Phase 1 included:

- Update and/or replace existing, obsolete and patchwork material handling equipment (MHE), controls and infrastructure.
- Replace multiple, non-integrated supervisory systems with a single warehouse execution system (WES) capable of integrating all MHE, controls and DC processes with existing, legacy warehouse management system (WMS). It must also provide intelligent, integrated supervision of all DC processes in real-time.

Phase 2 included:

- Implement a new Manhattan Associates' WMS and controlled retirement of the existing WMS.
- Apply the new WES to support the replacement of core retail distribution operations (picking and packing).
- Integration of the new WMS with all new and existing MHE.



PYRAMID DIRECTOR WES
WAREHOUSE EXECUTION SYSTEM



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

KEY FUNCTIONAL HIGHLIGHTS

Warehouse Management

Seamless integration of Director WES with Manhattan's WMS utilizing Manhattan's standards for both Ethernet TCP/IP sockets and FTP communications. Extensive information is exchanged to:

- Establish or change the identification, location and/or status of inventory at stock keeping unit (SKU), case or pallet level.
- Transfer information to produce internal control or shipping labels.

PYRAMID DIRECTOR WAREHOUSE EXECUTION SYSTEM



The Pyramid Director WES provides a comprehensive suite of simple, easy-to-use graphical screens for management and users, as well as a central control dashboard. The dashboard's powerful, intuitive and functionally complete dashboard tools support up-to-the-second status assessments of DC processes, wave execution, inventory status/location and MHE operations.

The Pyramid Director WES dashboard gives users complete, DC-wide visibility and control of inter-process routing of cases and totes. 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) features color graphics for diagnostics and KPI monitoring for all package conveyor and sortation MHE within the DC. The graphics give users complete visibility into all aspects of MHE operation—including conveyor and sorter performance, status, alarms and more—all monitored continuously by the WES.

KEY FUNCTIONAL HIGHLIGHTS

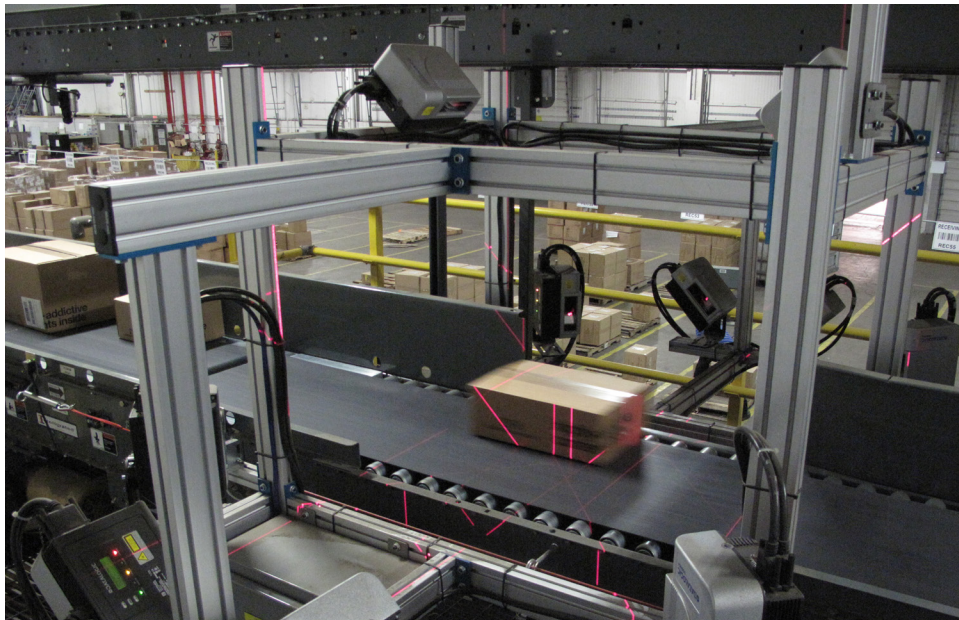
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Receiving

Complete overhaul of receiving, including upgrade a sorting process that automatically checks-in, auto-prints/applies labels (for internal control) and sorts cases based on content and disposition, such as pre-allocated or un-allocated, solid pack or assortments and more.

Cases are routed by Director WES and Case Sorter Controller to:

1. Shipping label print/apply and shipping sorter for crossdock.
2. Reserve storage to be picked at a later time.
3. An exception area for remediation.



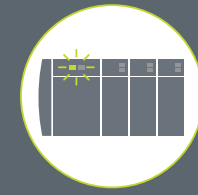
Pyramid's Case Sort Controller handles even the most demanding auto-ID and sorting tasks.

Picking

Implement a new picking process, where operators using handheld radio-frequency (RF) terminals and mobile equipment perform full case picks to pallet by wave from reserve storage. Completed pallets are then moved to a forward full case picking area for staging by wave as directed by a put-to-light system over pallet flow lane. The process is fully supervised by Director WES. At forward staging, the WMS transfers inventory by pallet/case/SKU to Director WES for further processing.

On the discharge side of the put-to-light, Director WES drives a case pick-to-light system for tasks by wave to maintain sequence integrity. Wave cases travel on take-away conveyors to the wave control sorter. Director WES manages the selection, start, aggregation, individual case routing, and closure of waves from picking through the packing.

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 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.

AUTO PRINT/APPLY CONTROLLER

Controls auto-ID, on-the-fly print/apply of compliance, carrier standard or other customer specific labels, and full process verification to ensure accuracy.



Completed, store-ready cartons are automatically scanned, sorted across a high speed slat sorter, and routed to their required shipping dock.

KEY FUNCTIONAL HIGHLIGHTS

(continued from page 3)

All less-than-full-case picking occurs in parallel with full case picking, in a separate DC area. Article picking is directed and staged, with inventory availability communicated by the WMS to Director WES. Here, Director WES takes over inventory control, broadcasting wave availability via networked display board marquees. Operators are directed by the marquees to transfer inventory to the packing sorter. Users scan containers of individually picked articles and load them onto conveyors for transport to the packing sorter. There, the individual items are inducted with full case counterparts by wave.

Sortation

The high speed pop-up wheel wave control sorter is supervised by Director WES and Case Sorter Controller. The sorter directs cases to one of three areas:

1. Case break sorter for routing to packing sorter.
2. Shipping print/apply for ship ready cases.
3. Remediation for sorting exception handling.

Cases, by wave, continue to the case break sorter. Here, they are sorted to induction workstations based on workstation availability and case queue levels (available work). Just like the routing sorter, the case break sorter is supervised by the combination of Director WES and the Case Sort Controller.

Wave Dashboard

Packing Sorter Management				Units				Cases		Tower Case	
Wave	WCS Wave Status	Sorter Wave Status	Packing	Total Expected	Divert	Pack	Residual	Total Expected	To Break	To Release	Res
01020101	Wave Started	Ready	300000123	2	0	0	0	1	1	1	1
01020102	Product Staging	Ready		30	0	0	0	1	1	1	1
01020103	Product Staging	Ready		24	0	0	0	1	1	1	1

Start Wave

Close Wave

Start Residual Induction - 202101010004

Sort Mode

WES (Stages)

Wave Detail

Residuals Area				Units				Cases			
Wave	Residual Status	Wave Type	Residual Cart Units Expected Count	To Pick	To Induct	Total Locations Unexpected	To Clear	Wave Detail	Cart Summary		
W0201001	Releasing	STOR0001	18	0	0	0	0	0	0		
W0201004	Staging	STOR0001	34	0	14	0	2	0	0		

Release from Residual

Residual Loc

Unpiled Carts

Missing Residual Units

Wave Detail

Cart Summary

PICK Tower				Units				Cases		Locations	
Wave	Case Staging Status	Wave Type	Case Units Expected Count	Case Units Staged Count	Total Expected	To Pick	To Release	To Locations To Clear			
01020101	Staging	STOR0001	N/A	N/A	0	0	0	0			
01020102	Staging	STOR0001	N/A	N/A	2	0	2	0			
01020103	Staging	STOR0001	N/A	N/A	2	1	0	0			
01020104	Staging	STOR0001	N/A	N/A	16	16	2	0			

Control Dashboard

Director WES offers a complete dashboard for at-a-glance view of all waves, status and progress.



KEY FUNCTIONAL HIGHLIGHTS

(continued from page 4)

At the packing sorter induction workstations de-casing occurs, and individual articles are placed onto automatic inductions. Articles, by wave, are inducted onto a cross-belt sorter, automatically identified and sorted into chutes (stores). The cross-belt sorter integrates with the WMS through Director WES.

Packing sorter operations are monitored continuously by Director WES. Single article sorting activity is relayed to the WMS in real-time, including expected and unexpected overages, or other anomalies. At the chutes, shipping cartons are packed-out with manifested contents uploaded to the WMS via Director WMS.

Error Handling

Remediation area operations are supervised by Director WES. Associates use Director WES screens on RF terminals to research the status of rejected cases, re-induct cases back to the routing sorter (after correcting errors), and stage cases in controlled case/pallet queuing locations (after correcting wave sequencing errors). Here, Director WES uses RF terminals to capture inventory status/location and update the WMS. Director WES also drives networked display boards that broadcast up-to-the-second wave information to operators, coordinating their tasks.

Shipping

All packed shipping cartons route to the shipping label print/apply operation where they are combined with the cross-docked, pre-allocated cases from receiving. This operation is supervised and controlled front-to-back via a combination of Director WES and Pyramid's Auto-Print/Apply Controller. Ship-to-store operations require several carrier specific (UPS, FedEx, USPS and others), GS1 (www.gs1.org) compliant open supply chain labels. Shipping labels are printed and applied on-the-fly at a rate of 50 cases-per-minute per-line (over two lines) on a 30-inch lead-edge pitch.

From the shipping label print/apply operation, cartons route to a high-speed slat/shoe shipping sorter. Director WES and Case Sorter Controller direct this operation from induction to automatic identification (auto-ID), through sorting to multiple docks. Sorting occurs per the store/dock requirements of—and with all activity confirmed to—the WMS.

FILTER-OFF									
ON APPLY CLEAR		Pick Case Staging Status: -No Filter-		Residuals Staging Status: -No Filter-		Packing Sorter Status: -No Filter-		Deemer Packing Sorter Status: -No Filter-	
#	Wave Search	Wave Link	Wave Detail	Wave Type	Pick Case Staging Count	Pick Case Expected Count	Pick Case Deleted Count	Pick Case Substituted Count	Pick Case Staged Count
1	20000121100	20000121100	20000121100	Staging	0	0	0	0	0
2	20000121101	20000121101	20000121101	Staging	4	0	0	0	4
3	20000121102	20000121102	20000121102	Staging	151	1	0	0	151
4	20000121103	20000121103	20000121103	Staging	0	0	0	0	0
5	20000121104	20000121104	20000121104	Staging	0	0	0	0	0
6	20000121105	20000121105	20000121105	Staging	5	0	0	0	5
7	20000121106	20000121106	20000121106	Staging	1	0	0	0	1
8	20000121107	20000121107	20000121107	Staging	2	0	0	0	2
9	20000121108	20000121108	20000121108	Staging	222	0	0	0	222
10	20000121109	20000121109	20000121109	Staging	0	0	0	0	0
11	20000121110	20000121110	20000121110	Staging	0	0	0	0	0
12	20000121111	20000121111	20000121111	Staging	0	0	0	0	0
13	20000121112	20000121112	20000121112	Staging	0	0	0	0	0
14	20000121113	20000121113	20000121113	Staging	17	0	0	0	17
15	20000121114	20000121114	20000121114	Staging	10	0	0	0	10
16	20000121115	20000121115	20000121115	Staging	14	0	0	0	14
17	20000121116	20000121116	20000121116	Staging	2	0	0	0	2
18	20000121117	20000121117	20000121117	Staging	1	0	0	0	1
19	20000121118	20000121118	20000121118	Staging	1	0	0	0	1

Real-Time Wave Visibility

Pyramid Director WES tracks each wave's status and reports on it continuously in real-time.

Wave Detail

#2

Search Wave

#3

Screen Links

General Info

File Info

Wave: 2000012625568

Case Staging

Case Break Counts

Case Staging

Case Break Counts

Packing Sorter

Residual Staging

Packing Sorter

Residual Staging

More Efficient Wave Execution

Pyramid Director WES handles all wave administration and execution, from forward staging through the packer sorting process.



Software and Controls for Maximum Distribution and Fulfillment Center Performance.



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.

Pyramid | A part of Matthews Automation Solutions

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