



"The Scoresby Distribution Centre is a 'mission critical' element of this business; if we do not perform efficiently in launching each month the many hundreds of new titles as well as supporting our other 50,000 titles, it impacts directly on the company's bottom line."

"While we had our challenges as do all new turnkey operations these were soon overcome with the help of our business partners, including Dexion and Dexion Integrated Systems, a change management program and the great dedication and commitment of our staff."

"We now enjoy considerably improved cycle times for all our operational activities along with markedly increased productivity and accuracy." Accuracy is a key issue.

"We will distribute in excess of 21 million books this year from the site, so even a 1% error rate extrapolated over that volume in shipments would be punishing. We have accordingly made the investment decision to integrate a number of systems and technologies designed to enhance efficiency and control quality," said Parkes.

So now let's take a look at the detail of the operation.

The nature of the task

There are approximately 40,000 pick locations at the United Book Distributors facility, consisting of carton live storage, shelving, full and half pallet positions.

With the recent consolidation of operations and extension of the facility, the distribution centre is expecting in 2004 to handle 350,000 orders dispatched in over 900,000 cartons: a total of 21 million books.

Adding to the issue of volume are the complexities relating to the nature of orders. As well as handling fast moving best sellers, the facility manages slow moving lines and "one-off samples" of educational books to academics.

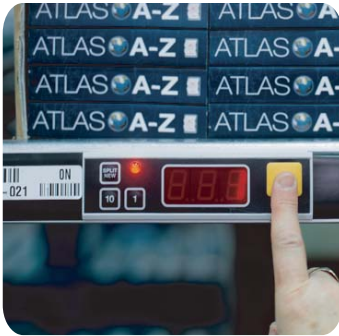
The design concept for the 20,000 square metre distribution centre is based on co-locating a bulk reserve storage area and a three-level picking module with an integrated sortation and conveying system servicing all picking requirements in a paperless and real-time environment. Product movement into and within the bulk storage area is managed via radio frequency (RF), while carton movements to replenish the picking zones are via rack embedded carton conveyor.

The first 6 bays of each aisle of the bulk storage area feature embedded conveyors 3 meters high in the racking. This ensures the bulk module operates as an element of the pick module providing rapid progress of full case picking and replenishment items to the split case storage areas. This conveyor is integrated with the overall sortation system for greater efficiency.

Order management

Orders are downloaded to the work pool and queued in order of priority, ensuring special conditions are managed without the need for constant monitoring or intervention from operators. Urgent orders are automatically slotted in at the front of the queue while others of lower priority follow. Urgent orders that are released as late as midday are despatched that same day along with all other daily orders.

Order fulfilment for the forward picking module is provided by the Dexion Realtime Distribution System (RDS) which manages functionality such as order induction, carton routing, paperless picking, quality control and dispatch. RDS has introduced automation to tasks often viewed as



labour intensive and time consuming such as order induction, label print and apply and check weighing, allowing staff to focus on value add activities. For example, incorporated into the conveyor system is a semi-automated carton construction and induction system ensuring valuable resource isn't wasted on laborious tasks whilst quality control is enhanced.

The forward picking module accommodates 31 picking zones each manned by one or more pickers responsible for selecting product from that area. Dexion's Pick-to-Light is extensively used throughout the operation, providing a common picking methodology across all picking areas other than the 3rd level of the Picking module which employs RF. Pick-to-light complements the concept of zone picking and provides the ability to dynamically allocate work and resources to meet fluctuating work load demands. It also provides valuable operational statistics on both the picking staff and product movement and, in conjunction with the warehouse management system, processes invoices and price labelling at the pick face.

The system has a combined capacity to handle shippers from all areas at a total rate of 30 shippers per minute. It also has the ability to re-circulate, eliminating bottlenecks and preventing work load disruption in down stream areas. This serves to balance out workload and maximise picking efficiency.

The RDS is an integral element of the paperless order fulfilment system, providing quality control features to ensure only correctly picked orders are allowed to exit the system.

Split case picking is further enhanced with semi automated void filling and fully automated carton sealing, through two automatic random carton sealers. Completed orders, whether full or split case, are conveyed for final sorting into the appropriate dispatch carrier lane.

Order-picking module

Originally, Dexion was asked to design a two - tiered mezzanine system that was capable of extending to a 3rd tier when required. Due to organic growth and new, third party contracts the 3rd level

was soon added. Today, the order-picking module is housed in a three-tiered mezzanine system where stock is picked for front and backlist book titles and educational texts. Approximately 40,000 titles are catered for and picked from the module.

All carton/shipper movements to and from the picking module are carried via a carton routing and sortation system supplied by Dexion Integrated Systems. This conveyor system provides maximum efficiency through its ability to route cartons to the necessary picking areas, minimising travel paths and maximising throughput. It allows virtually any order to access numerous parts of the distribution operation while providing total accuracy in terms of tracking and distribution.

Order-picking process

Within each PTL picking zone, orders are inducted for picking by scanning the shipping label, which illuminates the lights for those products required to be picked. Displayed quantities of the required products are picked and acknowledged by the pickers.



After completing all picks for the zone, the shipper is placed on the takeaway conveyor and sent to the next zone where picking is required. The shipper progresses through the pick module in this manner until it is complete. The management of invoice and pack-list printing is performed by the LogPro WMS in conjunction with RDS.

A key strength of the process is the provision of a transparent "closed-loop" quality control mechanism, which ensures invoice and pack-list documentation is requested, printed and picked. With invoicing included as an element of the picking process, the system ensures that every invoice is placed in the right shipper and that bottlenecks are eliminated.

The WMS determines which shipper will carry the invoice, which shipper requires price tickets and in which zone these are to be printed. This information is included in the WMS's download in the same manner as normal picks, and invoice or price ticket printing is carried out in predetermined zones or as a final step automatically after the last pick in the despatch area.

As each shipper is processed in a given zone, the RDS automatically recognises the requirement for invoice/pack-list printing and uploads a request to the WMS, which manages the printing as the picker picks the order in the normal fashion. The picker acknowledges the invoice/pack-list in the same manner by pressing the acknowledgment button on the picking display at the printer location.

Once the picking process is complete each shipper exits the module and crosses an in-line check weigher. Discrepancies are routed to a checking station where any errors are corrected and the shipper placed back on the conveyor ready for dispatch. Single book or small orders are batch picked into totes and routed to a dedicated packing area and placed in specifically designed cardboard packaging, which are then conveyed to dispatch. Invoices and pack-lists are generated semi-automatically while in the packing area.

"With Pearson's anticipated on-going growth, further expansions to the operation are planned, but not at the expense of service," said Sebastian Parkes. "Currently, if an order is

received by this facility by midday we can guarantee it will be despatched the same day if the customer so requires it. To accommodate future growth and 3PL opportunities we intend to maintain these service levels." "We are planning to extend the sortation system and number of pick locations and Dexion Integrated Systems will continue to play an integral role in our plans with its systems capable of continuous expansion on a modular basis," said Parkes. "Currently, this facility brings to the Australian book publishing and distribution industry an operation with the highest levels of service, bar none," he said.