

## TOTAL LOGISTICS

### ADDING VALUE FOR PREMIER FARNELL

*Premier Farnell plc markets and distributes electronic components and maintenance, repair and operations (MRO) specialist products and services throughout Europe, the Americas and Asia-Pacific. Highly customer-responsive, it combines traditional distribution skills with technologically advanced, proactive marketing disciplines. Premier Farnell specialises in servicing the needs of its customers for small orders, alongside high added-value, tailored services, often for research and design, manufacturing and maintenance, repair and operations activities across virtually every industry.*

*Premier Farnell operates in 21 countries and trades in over 100, with 5,000 employees, over 3,000 suppliers and a database of 1.2 million customers worldwide. The Group stocks a range of over 400,000 products and has access to six million more.*

*Listed on the London and New York Stock Exchanges, Premier Farnell recorded an operating profit for the year ended 2<sup>nd</sup> February 2003 of £82.9 million on sales of £759.0 million. It has also undergone a cost-cutting exercise while, at the same time, putting a new European distribution centre strategy in place.*

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As a volume distributor, Premier Farnell has to be highly customer-responsive: it combines traditional distribution skills with technologically advanced, proactive marketing techniques. It specialises in servicing the needs of its customers for small orders, alongside high added-value, tailored services—often for research and design and MRO operations activities across virtually every industry sector.

Farnell InOne is Premier Farnell's web-based eBusiness, stocking more than 250,000 products. In delivering the full catalogue in Europe while simultaneously cutting costs, Premier Farnell commissioned Total Logistics to design and implement the required logistics solution for expanding the company's Preston and Leeds distribution hubs to include Liege in Belgium.

Premier Farnell had successfully expanded its Farnell InOne eBusiness to cover the whole of Europe using its Leeds distribution hub, but wanted to cut the next-day delivery costs — particularly the express air carrier charges — required to maintain service levels. In addition, the company simultaneously wanted to expand its CPC business — currently based in Preston — into Europe.

With a new European distribution centre strategy in place for delivering cost-effective international fulfilment from mainland Europe, three preferred sites were subsequently identified in Liege, Belgium. Moving European operations to Liege would ease pressures on next-day delivery while allowing a significant volume of goods to be delivered more cheaply by road.

Several sites were considered: one existing building, one developer building about to be constructed and one 'Greenfield' purchase and construct site. The initial warehouse design work identified an optimum building requirement of 23,000sq m, starting at 14,000sq m and then expanding as required. Premier Farnell has a significant amount of in-house logistics expertise but felt that additional skills were required on the project. Total Logistics was selected after a lengthy evaluation process. Premier Farnell's key selection criteria included practicality, cost-effectiveness, on-time delivery and an implementation that would not impact on existing operations.

Total Logistics' role was six-fold: to develop a good planning base for the Liege centre; to evaluate alternative technologies for its operation; to develop the centre scheme designs; to support the design of the site layout and the site searching process; to produce an overall implementation plan; and to demonstrate the requirements of the inter-site replenishment operations at all sites — Leeds, Preston and Liege.

In addition, Total Logistics identified three optional areas that would add value to the project and increase the effectiveness of the solution. These were to support Premier Farnell's IT team with Warehouse Management System (WMS) development; to develop tender specifications for all storage and handling equipment; and to implement the final solution design. Total Logistics' own analysis methodology—Insight—was central to the project approach. Insight is a set of proprietary tools, developed and applied to translate raw and often incomplete data into relevant information that helps optimise the resulting solution. Modules spanning inventory, warehousing, transport and process modelling were applied, all linked across a dynamically maintained, common database platform.

With the strategy established, planning began by gathering detailed data (to order line level) and overall familiarisation with the operation. This drove the Total Logistics Insight models which then generated a number of potential design options to ensure that every relevant factor was taken into account.

## **STOCK MODELLING**

The dynamic modelling exercises provided flow and stockholding models for the Liege operation, future planning base using growth forecasts and overall network flow charts based on product allocations to Leeds and Liege. In addition, modelling provided a stock allocation and replenishment strategy between the two sites plus centre handling and storage methods for peak, average, current and forecast volumes.

The design evaluation produced a range of solutions across a number of operational areas. The first stage was unit load allocation. This optimised the unit load format for each stock keeping unit (SKU), driving efficiencies for each product's movements through the warehouse. The analysis provided the basis for modelling all the remaining warehouse functional areas.



*New pick loop*

Total Logistics also evaluated the receiving, storage, picking, returns processing and value added activities. These included pre-bagging, ROM programming and calibration.

Within the picking operation, Total Logistics assessed the allocation of products to picking zones through a number of strategies. Order completion was simulated (with resultant activity profiles and work content) alongside with calculated pick rates based on activity profiles and analysed pick zone congestion.

Stock modelling was used to evaluate optimum inventory and replenishment levels and also addressed network replenishment rules: each option was then detailed in terms of space requirements, capital and operating costs.

Using team workshops, Total Logistics outlined the options modelled and agreed the preferred technologies for the final scheme design. This was applied to layout drawings for an 'ideal' greenfield site and evaluated against the sites already under consideration.

Having evaluated the options, Total Logistics designed the optimum solution that featured increased pre-bagging, pick handling cut by 20% and counting errors cut by over 25% using narrow aisle bulk storage. A single level picking area using radio data terminals (RDT) with zoned picking would despatch product to the conveyor.

Finally, the mechanised packing and a replenishment optimisation strategy included supplier direct delivery on selected SKUs to reduce network handling costs. Completing the picture were equipment and manning levels in detail plus full capital expenditure, annual operational budgets and a project implementation plan.

According to Premier Farnell, the Total Logistics' solution took into account the lowest cost based on the mix of space, productivity, capital expenditure and operational efficiency. It also allowed flexibility to allow for day-to-day changes, unplanned operations and future possible variations to throughput and configuration — all achieved without significant additional capital investment and allowing for the planned growth strategy.

One specifically important feature of the solution was the conveyor system: the data analysis revealed a high level of single line and single zone orders in the Premier Farnell order profile. This meant that significant efficiency gains could be achieved by improving the current batching process. This was incorporated into the final design by developing a zoned picking system linked by conveyor.



*The new Vanderlande conveyor system*

To maximise benefits, the conveyor had to be as seamless as possible and simple to operate. In addition, it had to cope easily with volume variations, imbalances and breakdowns and by incorporating multiple entry and exit routes, downtime was minimised and no control point was required. Innovatively, orders could be launched at any point along the conveyor.

In addition to the solution budgets, resource requirement plans and timelines, Total Logistics developed a complete set of deliverables including: section and elevation drawings; an operational description; outline warehouse management system requirements; key building requirements; their interfaces and an outline of the replenishment operations at other sites — to and from the Liege centre.

## **PROJECT MANAGEMENT**

With the solution design agreed, Total Logistics acted as the project 'Engineer', a role with officially defined responsibilities for managing the tender process. In this instance, Total Logistics was responsible for the procurement of all internal equipment required for the warehouse: detailed specifications went out to 26 companies for tender, managed through a number of short-listing stages before final selection took place. Simultaneously, Premier Farnell reviewed its WMS strategy with Total Logistics.

Total Logistics were retained to provide full support during implementation, with a high level of responsibility for solution testing and delivery, including managing all supplier contracts.

As the extent of the global economic downturn in 2001 became apparent, the full implementation of the project was postponed for one year. However, the costs of fulfilling European orders from Leeds were still high. In response, Total Logistics designed a smaller manual intermediate solution that could rapidly deliver important parts of the overall cost reduction with minimal capital investment.

Total Logistics knew that to derive maximum benefit from the interim solution, work content had to be optimised. The maximum number of orders was profiled with the minimum number of lines. This identified the SKUs that could be positioned in Liege to give the lowest start-up and operational costs plus the greatest savings on shipping.

### **PLANNING CONTINGENCIES**

The data was re-modelled but the original solution had been designed with sufficient flexibility to accommodate the majority of range and volume changes. The interim solution could therefore be a scalable subset of the final design.

The interim Liege solution went live in September 2002 and is delivering the planned cost reductions. It features a 19,000sq m greenfield warehouse in two sections (initially 15,000sq m followed by an additional 4,000sq m) with a clear height of 10m and a usable height of 8.5m to accommodate sprinklers. There are 24 conveyerised picking zones covering around 20,000 shelf locations. Products are stored in four tote sizes, in manufacturers' containers or as free stock (for larger items) on shelving.

All picking and stock movements are confirmed with wrist mounted RDTs feeding into the network of Dell PCs; scanning of barcodes is done via finger-mounted scanners and label printing via belt-mounted printers. Improved batching and picking techniques have generated substantial improvements in picking productivity, saving time and money.

The conveyor servicing the picking zones is self-routing and able to handle more than 1,000 orders per hour. The design incorporates routing flexibility and fault tolerance, allowing continued operation in the event of breakdown.

The picking process includes an inspection area, a consolidation area and picking spurs. The consolidation area is automatically routed if there is more than one tote and the picking spurs have semi-automatic case-sealers.



*The inspection station off the conveyor*

The interim design has three zones of bulk storage with 3,000 pallet locations, 6,000 shelf locations and a reserve of 1,600 pallet locations. All pallet racking is adjustable and fire-protected. About 40% of the storage area is static protected with conductive storage bins and totes and special earth conductive flooring.

Protection has been included for building columns and rack legs where appropriate and all narrow aisles use rail guidance and are suitable for narrow aisle equipment. The materials handling equipment (MHE) consists of narrow aisle combis, VNA order picking vehicles, reach trucks, a counterbalance truck plus hand pallet trucks. The specification for MHE is tied in tightly with that of the racking so that they work effectively together.

### **THE BENEFITS**

A clear and costed upgrade path has been provided to respond to unplanned volume increases. It details the actions required, the cost and the resulting output. The interim solution provides three quarters of the 24 zones of shelving with no conveyor—and the solution is handling around half the expected order volume planned for the final start-up configuration.

Total Logistics continued to support Premier Farnell through the phased implementation with the remaining picking area being first followed by two stages of bulk storage implementation. Its approach throughout has given flexibility to allow for 'step' implementation, without the requirement for costly re-engineering. The interim racking configurations and SKU storage locations mirror the final solution and all Premier Farnell's growth and planning objectives have been built in to the interim and final designs.

Critically — and despite necessary changes to the original solution design — Premier Farnell is accruing the delivery savings it first sought for its international eBusiness. Total Logistics has streamlined the operations to save time and money, maximised available warehousing space and integrated a third distribution hub into the business while ensuring that customer service levels remained high and operations uninterrupted.

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***About Total Logistics:***

Total Logistics specialises in all aspects of supply chain and logistics consultancy, with a client base that includes Nestlé, Unilever, adidas, Coty, Tesco and Hema. Working across the complete range of supply chain and logistics operations, Total Logistics functions solely to add value and subtract costs. Activities include strategy definition through to implementation and project management; network modelling, distribution strategy, location optimisation, cost modelling and benchmarking. Total Logistics' experience covers all industry sectors and its clients comprise sector leading companies but also much smaller lesser well-known names to whom its consultancy, advice and services are equally as critical. Over 70 per cent of its revenue comes from existing clients and its greatest source of new business derives from personal recommendations. Now recognised as a leading consultancy in this field, Total Logistics has established a reputation for delivering high quality, practical and robust solutions to clients' needs.

*Total Logistics has offices in the UK and the Netherlands. For further information visit: [www.total-logistics.eu.com](http://www.total-logistics.eu.com) or [www.total-logistics.nl](http://www.total-logistics.nl).*

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