We Optimize Your Supply Chain

DEMATIC

Manufacturing Logistics

RESPONSIVE, FLEXIBLE AND RELIABLE PERFORMANCE

Cost Drivers
Return on Investment
Space Efficiency
Productivity
Efficient Supply Chain Design

Service Level Drivers
Accuracy
Delivery Lead Time
More Smaller Orders
High Throughput

Inventory Drivers
Inventory Reduction
Supply Chain Consolidation
Number of SKUs
Cost & Service Levels

External Factors
Government Legislation
OH&S
Lot and Batch Tracking
New Competition

Strategic Logistics Alignment

Using strategy to develop the best logistics solution for you

Diverse technologies and applications can lead to a wide range of solutions geared to produce different results.

Very high service levels, for example, may require additional inventory to minimize stock outs. On the other hand, additional inventory increases total supply chain costs. Short lead times demand high order velocity with flexible systems and processes.

In tight competitive markets, lowest cost per item delivered may determine competitive advantage. Each solution can be designed to achieve the necessary result, but there is a trade-off.

In choosing the right solution, you need look no further than your own Strategic Business Plan. It is here that the clues will be found. At Dematic, we group the drivers, determine the best fit for you and design a solution that creates strategically aligned logistics results.

Global Trends Affecting Manufacturing

- Supply chain pull has shifted inventory back up the supply chain to the manufacturer
- OH&S legislation is becoming increasingly restrictive
- Product ranges (SKUs) proliferate as consumer tastes diversify
- Cost of labor increases while availability decreases
- Cost of land increasing
- Legislation and consumer pressure driving need for greater supply chain visibility

Implications of Global Trends

- Supply chain lead time is dramatically reduced
- Automation of manual processes to deal with labor availability & OH&S issues
- Manufacturers deliver smaller orders, more often, in tighter delivery windows
- Visibility, flexibility and responsiveness is critical to service level performance
- More complex order fulfillment
- Distribution is centralized
- Manufacturers value-add through:
  - Faster response times
  - Delivery reliability
  - Greater accuracy
  - Lot and batch tracking
  - Quality control

The demand for smaller, more frequent deliveries has changed the supply cycle for manufacturers from push to pull.

Logistics Systems Drivers	Speed	Flexibility	Traceability	Service Levels	Range	Reliability
Key competitive logistics capabilities	Order turnaround and response time	Meeting changing market needs	Monitoring the order and tracking by batch/lot	Minimizing cost of errors and optimizing customer service	Cope with a wide order and product profile	Maximize multi-shift system utilization

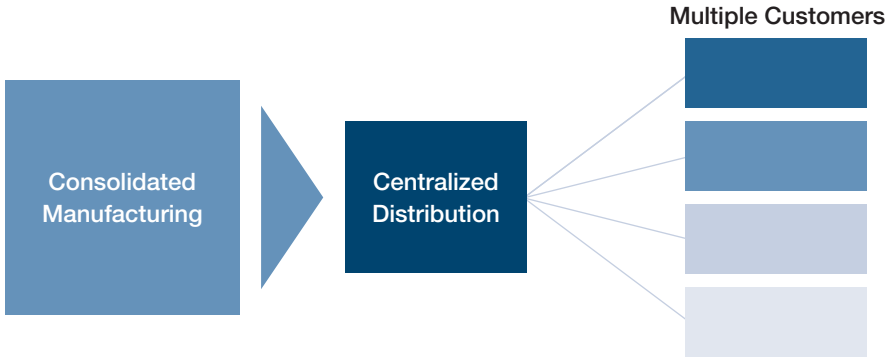
The Manufacturing Challenge

Centralized manufacturing and distribution leverages scale and increases justification for automated processes

Getting your products to market on time and at a competitive price is becoming increasingly challenging.

Retailers are demanding smaller, more frequent deliveries and tighter delivery windows.

Understanding how to meet changing market demands as efficiently and cost-effectively as possible is core to the success of your business. And it is a never ending challenge, because technology and service expectations are constantly changing.



Centralized distribution makes the supply chain more efficient and reduces non-value adding transactions to a minimum.

Manufacturers are taking a wider view. End to end supply chain issues are considered just as important as manufacturing processes.

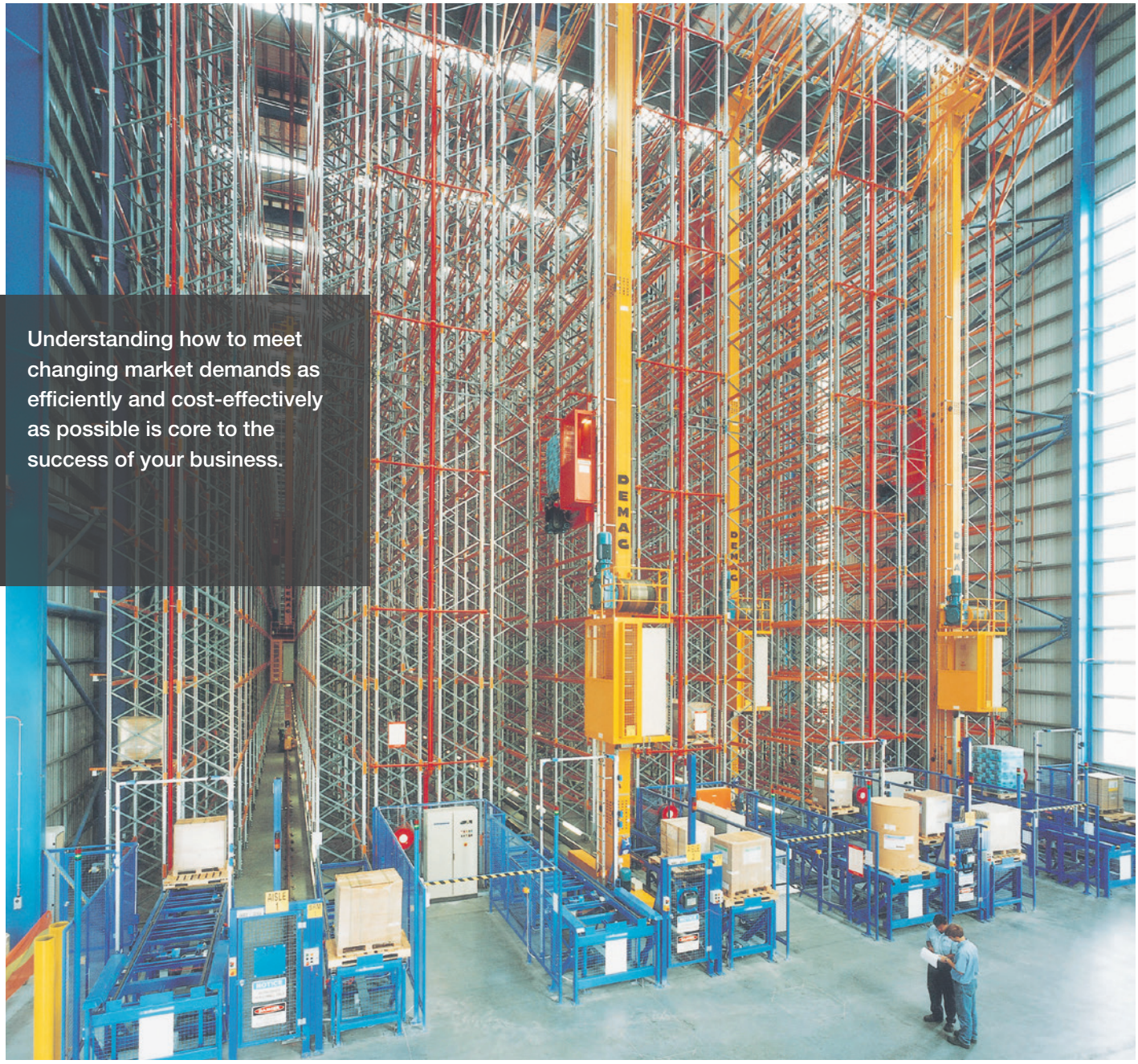
Legislative changes and labor availability make it harder than ever to manually handle more complicated orders and meet higher supply chain velocity.

Although centralization allows scale effects, traditional long manufacturing runs are no longer possible. Manufacturers are facing ever-reducing supply chain lead times forcing a consolidation of inventory and processes.

Your target is to add value by lowering costs, speeding delivery, offering higher service levels, with greater accuracy, and providing your customers and suppliers with greater control and visibility.

Meeting the challenge can lead to success and considerable competitive advantage.

Through extensive applications knowledge, industry leading technology and a global breadth of integration experience, Dematic can create logistics results for your company that can in themselves become global benchmarks.



Understanding how to meet changing market demands as efficiently and cost-effectively as possible is core to the success of your business.

Developing and implementing a solution for you

Data Analysis → Collaboration → Determine Solution Options → Test & Simulate → Partner & Implement → Post Start-up & Training → 24/7 Service & Support

End to End Manufacturing Logistics Solutions

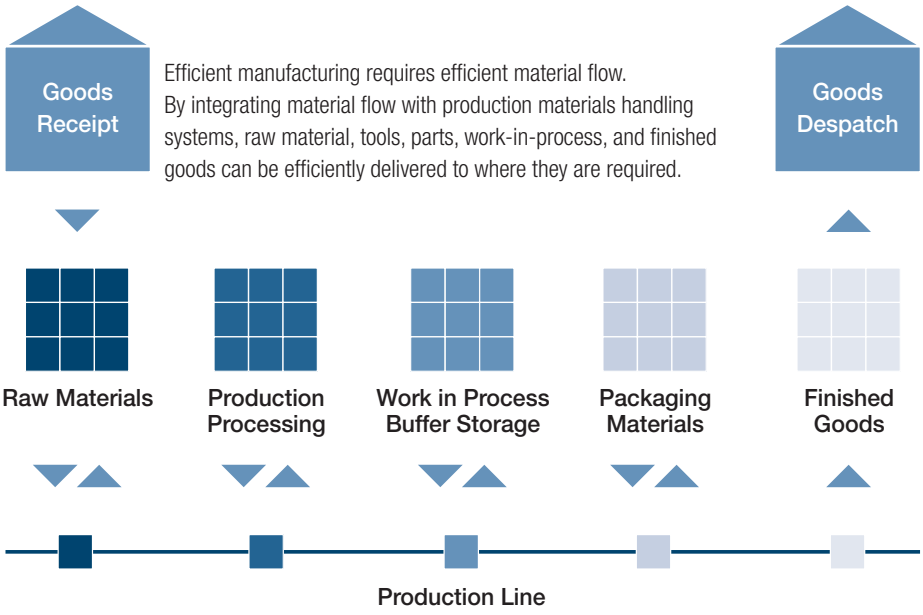
Complete solutions for receiving, storing, handling, transporting, palletizing, picking and dispatching your products

When you analyze the manufacturing process, it is a material flow challenge.

You need to receive all of your raw materials, store them until you are ready to make something, then bring them together in the correct sequence and quantities.

You then transform the raw materials into products and package them for ease of handling and transport.

Efficient handling, storage and material flow is essential at all stages of your supply chain to optimize your competitive advantage.



Receiving

Auto-Truck Unloading
RF & RFID AutoID
Integrated IT & Material Handling Systems

Quality Control

Order Checking
Batch/Lot Control

Bulk Buffer Storage

Automated Storage & Retrieval Systems
Accumulation Conveyors for Online Buffer Storage

Kitting & Material Flow

Smart Transportation Systems
Mixed Pallet Building

Production Lines

Production Conveyors
Ergonomic Workstations
Integrated Packaging

Efficient handling, storage and material flow is essential at all stages of your supply chain to optimize your competitive advantage.

Carton/Case Handling

Transport, Accumulation, Merging & Sorting Systems

Palletizing

Ergonomic Manual Palletizing Workstations
Automated Palletizing

Storage & Handling

Unit Load Handling & Transportation
Automated Storage & Retrieval Systems

Picking Solutions

Wireless Picking Solutions: RF, RFID, Voice & Pick to Light Case Picking & Pallet Building

Management & Control

Seamless IT Systems Integration & Material Flow Control

Carton, Case & Crate Handling Solutions

End of line product handling and transportation options

When it comes to handling, storing and shipping finished goods no one understands the challenges you face better than we do.

At Dematic, we deal with the problem every day and have a successful track record of turning it into a competitive advantage for many of the world's leading manufacturers.

From different ways of safely and reliably transporting your goods to where you want them, keeping track of them, storing them efficiently until you need to pick and ship to customers, we can show you a better way.

As manufactured goods exit the production line, they are packaged and packed in cartons or cases for handling and transport.

The most efficient way to handle and transport products over distance is by conveyor, and there are a wide variety of conveyor systems to suit different product characteristics and performance requirements.

In developing a production handling system we design for maximum system uptime using reliable, proven conveyor technologies.

Transport conveyors, typically powered roller or belt conveyors, and accumulation conveyors interface to any number of devices such as elevators, storage systems, inducts, merges, diverts, in-line check weighers, shipping stations or palletizing.

High speed production lines feeding robotic palletizing operations typically require a buffer to ensure system effectiveness. True zero-pressure accumulation conveyors minimize production interruptions and maximize total system efficiency.

End of line handling and storage options

Production Line	Carton Handling & Transport	Palletizing	Unit Load Handling	Storage or Dispatch
Finished Goods including Cartons, Crates, Cases, Trays	Transport, Accumulation & Sorting Conveyors	Manual Palletizing to Ergonomic Pallet Building Platform Dedicated Palletizers	Integrated Pallet Handling Conveyors Automated Electrified Monorails & AGVs	Automated Storage & Retrieval Systems Auto Truck Loading

End of line conveyors are an essential link between manufacturing and distribution. They must be fast enough to take product away from production to prevent interruptions and be reliable, as any stoppage quickly flows back to the production line.

High Speed
Merging & Sorting
Solutions

Comprehensive range of merging, inducting and sorting systems for high speed product sortation

Balanced product flow is a must for high volume distribution. Feeding a sorter consistently means on-time delivery to your customers. Balanced flow increases system throughput and eliminates bottlenecks.

Sound sortation system designs begins at the merge, which stages and feeds product continuously.

The induct identifies the product, works out where it's got to go and creates the gap for sortation allowing the sorter to run at optimal speed.

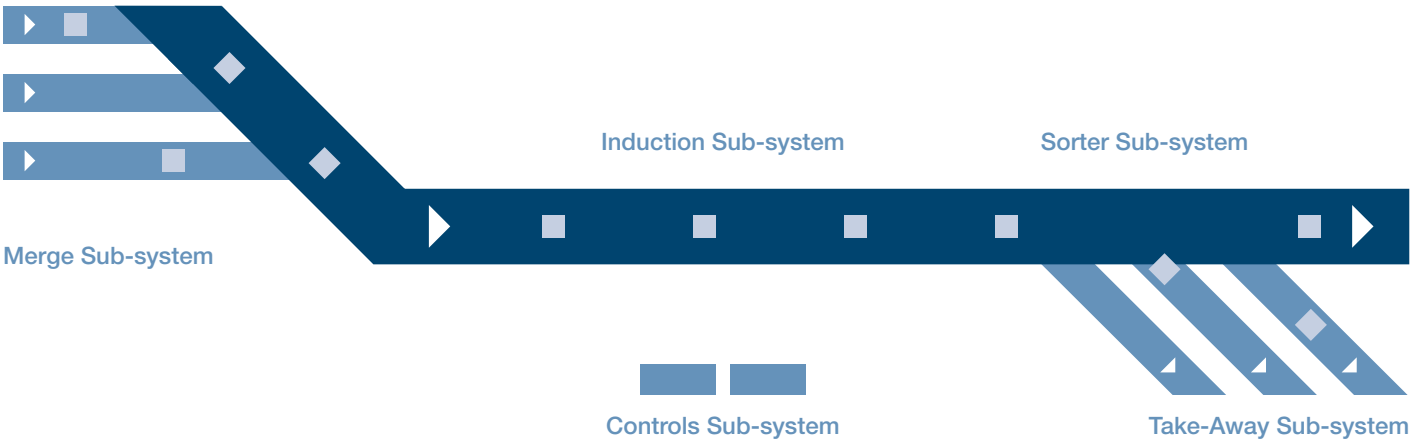
Straight Line Sorters are most cost-effective where the number of sortation points required is relatively small, for instance, up to 40-50 delivery points, and throughput rates up to 12,000 items per hour*.

Continuous Loop Sorters provide a much greater degree of functionality and flexibility, and may be designed to handle much higher throughput rates of up to 40,000 items per hour, as well as sort to several hundred delivery points.

They are also easier to merge goods onto, and may be used for other functions, such as transferring goods from one part of a facility to another, from one process to another, and consolidating items from various areas.

Different types of diverts can be used including sliding shoe, pivot arm, pop-up wheels, tilt-trays and crossbelt sorters, with selection based on factors including product characteristics, the speed of the conveyor and the required throughput.

*Assumes average carton length of 400mm



It's often necessary to bring products from several areas together to facilitate efficient transport and then sort them back into their individual product groupings for palletizing, storage and shipping.

Manual & Automated Palletizing Solutions

Automation eliminates OH&S issues and delivers safe, consistent, reliable and cost-effective palletizing

The high cost of labor and increasingly restrictive OH&S regulations concerning manual handling makes a strong case for automated palletizing.

Automated palletizing systems provide reliable, around the clock performance, and may be designed to handle individual cartons or full pallet layers of goods in higher throughput applications.

Advances in product recognition technology including vision and profiling systems now enable robotic palletizers to handle mixed streams of goods and build pallets of mixed products.

Depending on manufacturing volume, a number of palletizing strategies are available.

Manual Palletizing

Manual palletizing poses OH&S challenges, so ergonomic pallet building platforms may be used to minimize operator lift and rotation.

Gantry/Portal Robots

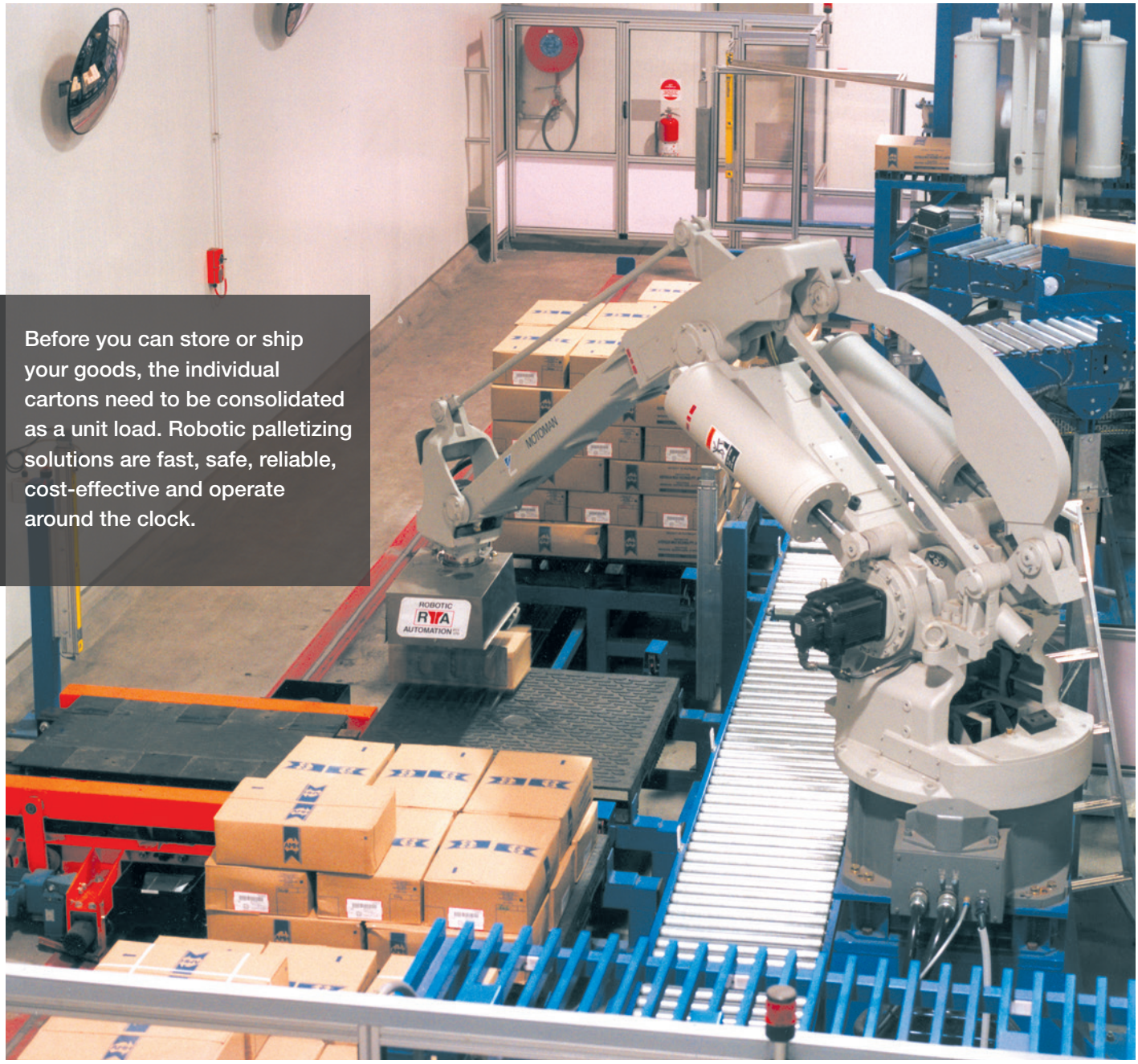
Gantry or Portal Robots can increase speed and flexibility with access to larger areas and more pallets.

Articulated Robots

Articulated Robots further improve palletizing rates by offering even greater speed and flexibility of operation.

The options for palletizing

Manual Palletizing	Gantry/Portal Robots	Articulated Robotic Palletizing	Dedicated Mechanical Palletizing
Low Volume Palletizing to Ergonomic Pallet Building Platform	Multiple Palletizing Locations	Flexible, High Speed, High Volume	Highest Throughput, Lowest Flexibility



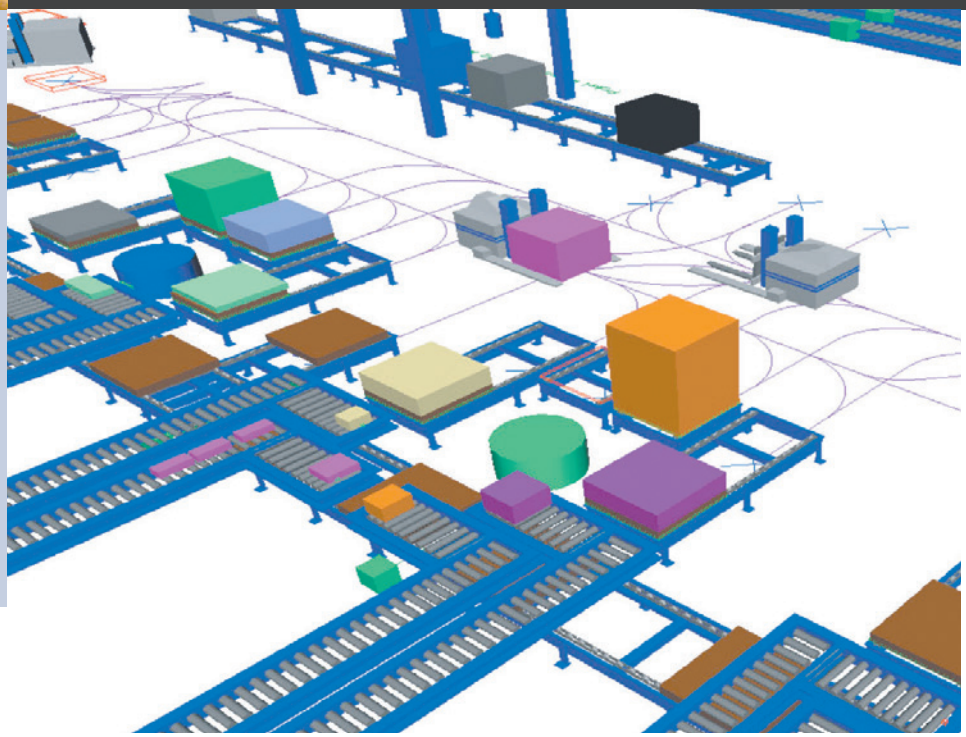
Before you can store or ship your goods, the individual cartons need to be consolidated as a unit load. Robotic palletizing solutions are fast, safe, reliable, cost-effective and operate around the clock.

Unit Load Handling Solutions

Unit load handling solutions for low, medium and high throughput applications

Dematic provides complete solutions for handling unit loads based on required throughput, pickup and delivery complexity.

Once the finished goods have been assembled into a palletized unit load, handling options range from manually operated techniques such as pallet trucks and forklifts, through to fully automated solutions such as Automated Guided Vehicles (AGVs), unit load conveyors, pallet shuttle carts and electrified overhead monorails.



Low, medium and high throughput

Pallet Trucks, Forklifts	Automated Guided Vehicles (AGVs)	Pallet Conveyor	Electrified Overhead Monorails
Low to Medium Volume Handling	Lower Volume, Flexible Applications	Dedicated Application Medium to High Volume	High Speed Transport Ceiling-Mounted with Variety of Load Carriages

Automated pallet conveyors and electrified monorails are fast, accurate and reliable methods of transporting unit loads to storage or dispatch, where they can interface with Auto Truck Loading and dispatch systems.

Manual Storage Solutions

Options for handling and storing your goods until you need them

Working Out What You Need

Choosing the most cost-effective and efficient system must take into account:

- The number of products
- The volume of each product
- The movement rate
- The physical size and weight of the products to be stored
- Expected growth; and
- A host of other matters including the type of materials handling equipment to be used.

Selective & Non-Selective Systems

Selective Racking Systems provide immediate, ready access to virtually all pallets. Non-Selective Racking Systems restrict access to individual pallets, but are more space efficient than Selective Systems.

Often the correct solution involves using a combination of Selective and Non-Selective Racking types to provide the optimum combination of access with space efficiency.

Selective Racking Systems are needed where there are a high number of SKUs with only a few pallets or less of each and include Selective, Double Deep and Narrow Aisle Rack.

Non-Selective Racking Systems are appropriate where there are many pallets of each SKU and include Drive In and Push Back Rack, and Pallet Live Storage.

Pallet Storage Occupancy

No pallet storage system can effectively use 100% of the space.

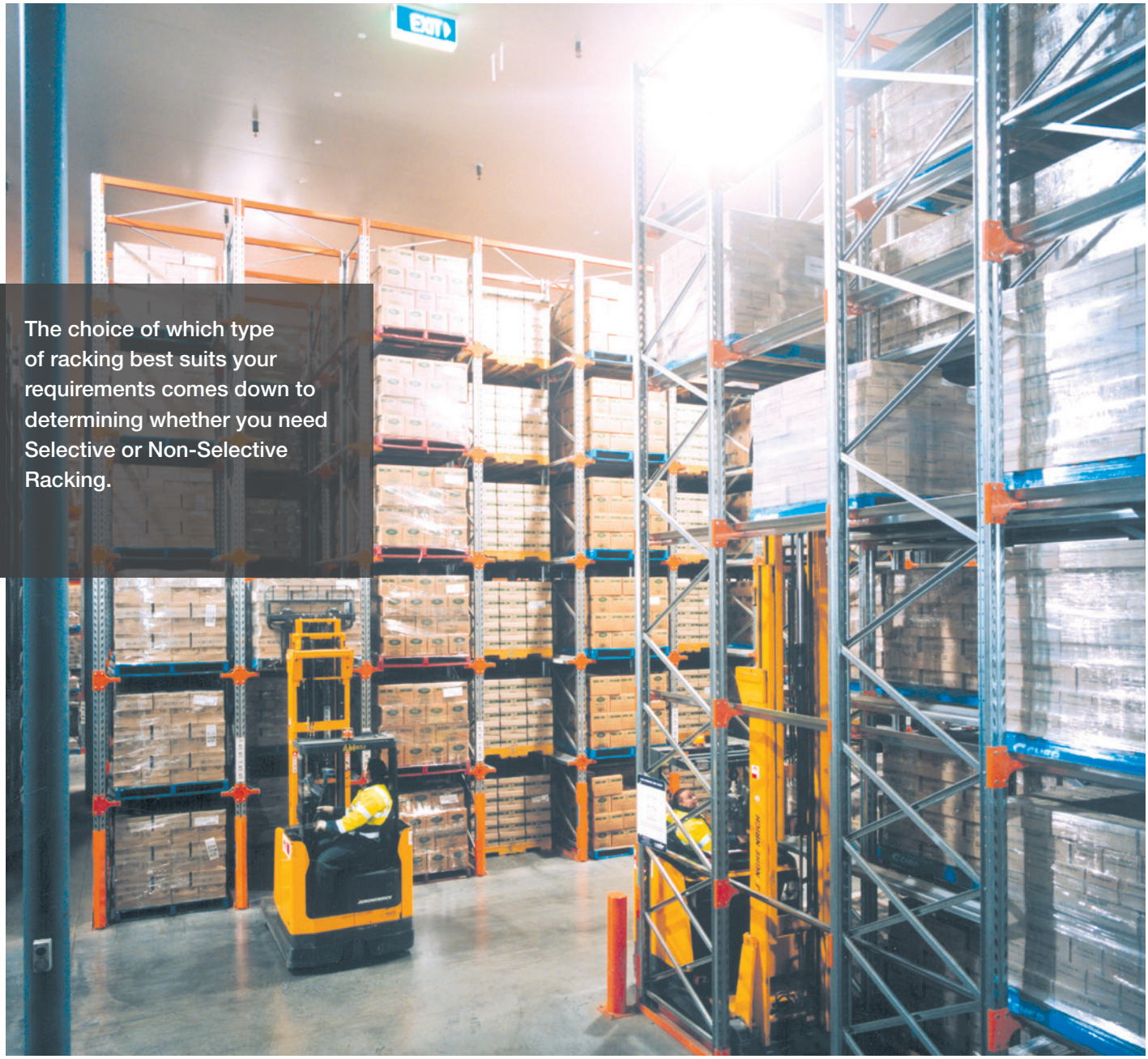
Non-Selective systems lose a higher percentage of space because there may be no pallets of the same SKU to fill all of the available slots in a lane:

Effective Storage Capacity

- 95% Selective
- 85% Double-Deep
- 70-85% Pallet Live Storage/Push Back Rack depending on lane depth
- 60-75% Drive-In depending on lane depth and height.

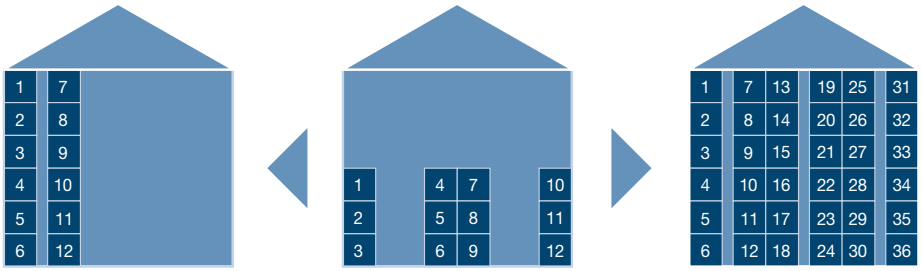
Manual storage options for unit loads

Selective Rack	Double Deep Rack	Drive-In Rack	Push Back & Pallet Flow Rack	Non-Pallet Storage Racks
100% Selectivity Normal to Narrow Aisle	Space Saving Requires Special Forklift	Dense Storage High Volume Applications FILO	High Density FIFO Auto Stock Rotation	Custom Storage Applications



The choice of which type of racking best suits your requirements comes down to determining whether you need Selective or Non-Selective Racking.

Automated Storage Solutions

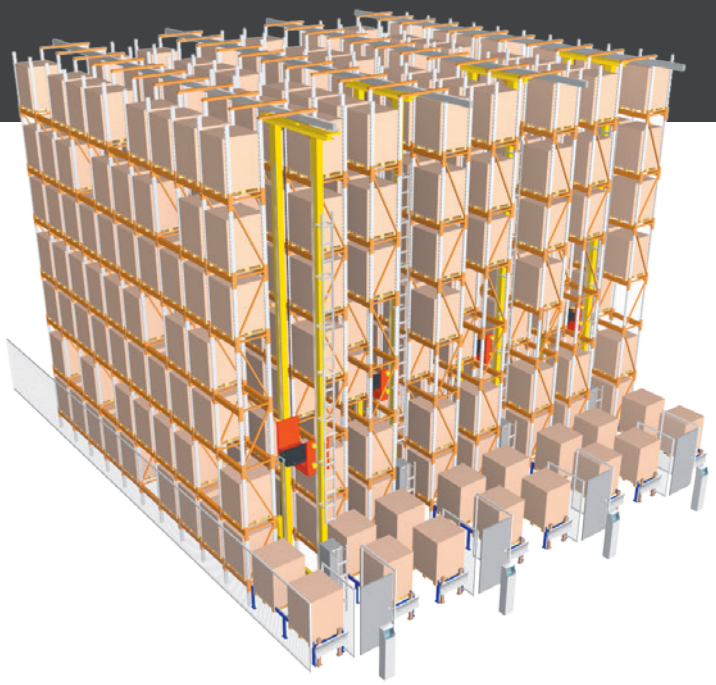


Automated warehousing requires much less space than forklift operations, enabling substantial savings in land, building and floor space costs. Compared to forklift operations (center), automated warehousing allows you to either free up additional floor space (left) or store up to three times more in the same areas (right).

Automated storage solutions provide:

- Space savings
- Lower building costs
- Improved productivity and throughput
- More efficient material flow
- Reductions in inventory
- Accurate, error-free operation
- Reduced product damage
- Safer and cleaner operations
- Improved security
- Less people and wheeled equipment
- Increased reliability
- Reduced operating costs (labor, maintenance, electricity)
- Better ROI and lower lifecycle cost

Save space, maximize your storage capacity and minimize costs



The Dematic Storage Cube

The Dematic Storage Cube is a new low-cost, pre-configured AS/RS specifically designed for manufacturing applications. It includes all hardware, software and controls and offers a cost-effective alternative to traditional storage and handling.

The Dematic Storage Cube can fulfill the role of raw materials warehouse, dynamic buffer store for kitting and assembly, and full pallet picking.

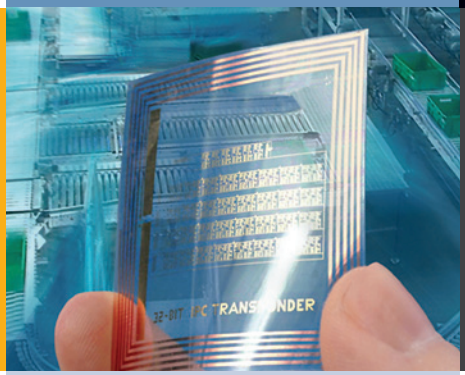
By teaming our advanced technology with cost effective, locally sourced components, we provide an excellent combination of performance, productivity and value for money.

Applications

- Any manufacturer who wants low cost, reliable pallet storage and handling
- Existing facilities where improving space efficiency is necessary
- Operations requiring reliable JIT delivery
- Work-in-process & raw material storage

Centralized distribution increases the opportunity for automated storage and handling. Dematic provides a range of AS/RS configurations for single, double and multi-deep operations.

Wireless
Picking
Solutions



Real-time wireless picking solutions with smart IT & material flow control

Enterprise-wide, real-time information management and communications systems are vital to ensure you know what is going where, and when, at any given time of the day.

The use of wireless data networks to real-time enable the transfer of data is now a standard feature of most DCs.

RF, RFID and Voice-Directed Computing reduce errors, improve OH&S and productivity and provide real-time track and trace functionality from goods receipt to dispatch.

A wide variety of technologies exist to improve the efficiency of product or unit load picking.

These include:

- Wireless (RF) mobile computers
- Voice-directed computing
- Pick-to-Light systems

These technologies are used with numerous picking concepts to maximize productivity and throughput.

Voice-directed order picking prompts the operator through a series of tasks with clear, verbal commands.

These are transmitted in real-time by a radio frequency (RF) system that interfaces with the user's host WMS or ERP system.

The operator wears a small headset and the lightweight, portable voice-computer is attached to a belt around their waist.

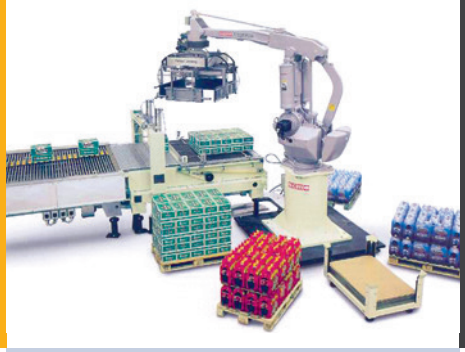
This keeps both hands free at all times while picking and, because the operator doesn't need to waste time looking at and reading the data on a screen or picking list, OH&S and productivity are significantly enhanced.

Enabling technologies for picking

Hand Held RF Terminals → Vehicle Mount RF Terminals → Voice-Directed Picking → Pick & Put-to-Light for High Velocity

Hands-free, eyes-free Voice Picking has quickly become a preferred order fulfillment solution around the world, saving thousands of dollars daily through enhanced productivity and in the costs associated with rectifying picking errors.

Automated Picking Solutions



Auto picking of cases, layers and full pallets increases accuracy, reduces cost and eliminates manual operations

As retailers demand smaller, more frequent deliveries, manufacturers are seeking a more cost-effective solution to case, layer and mixed pallet building.

New developments in vision and laser recognition systems, and pallet building software, have enabled significant advances in automated picking.

A variety of Robotic and Dedicated Layer Pickers with a multitude of flexible gripper heads are available to suit most package types.

Designed to operate in multi-shift applications, these technologies offer significant advantages to manufacturers.

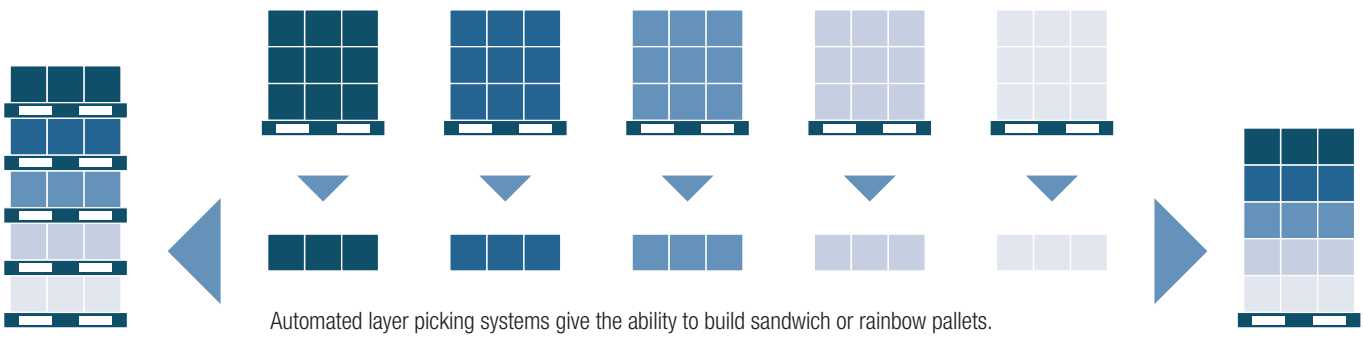
Automated picking solutions which provide accurate, reliable and flexible operation, are becoming increasingly available including

- AS/RS for pallets and unit loads, such as totes and crates
- Multi-shuttles, a new concept for retrieving unit loads
- Robotic and dedicated layer pickers
- Vision-enabled robotic case picking
- Automated case sequencing systems.

Manually assembling pallets with layers is a labor-intensive, physically demanding and costly exercise.

Automated Layer Pickers are fast, reliable and cost-effective options for handling whole layers of almost any product, from cases to shrink-wrapped packs of bottles and cans.

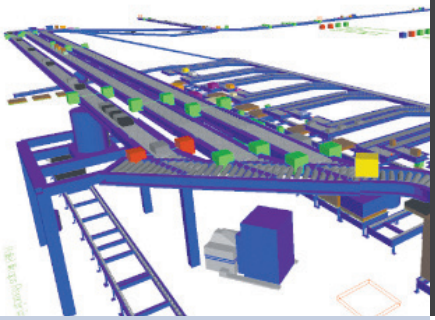
They enable the user to assemble multi-product pallets to customer orders without the costs, OH&S concerns and product damage associated with manual handling.



Automated layer picking systems give the ability to build sandwich or rainbow pallets.

Consolidated operations that provide the opportunity to increase volume, combined with restrictive OH&S legislation, increase the returns available by automating picking operations.

Systems Integration
Management
& Control



Real time, integrated order management, material flow & machine control software

High speed production handling systems rely on the seamless integration of equipment controls and software.

Interfacing these sub-systems with the host computer is essential for efficient material flow and machine control, but also captures essential transaction data for the Historian database.

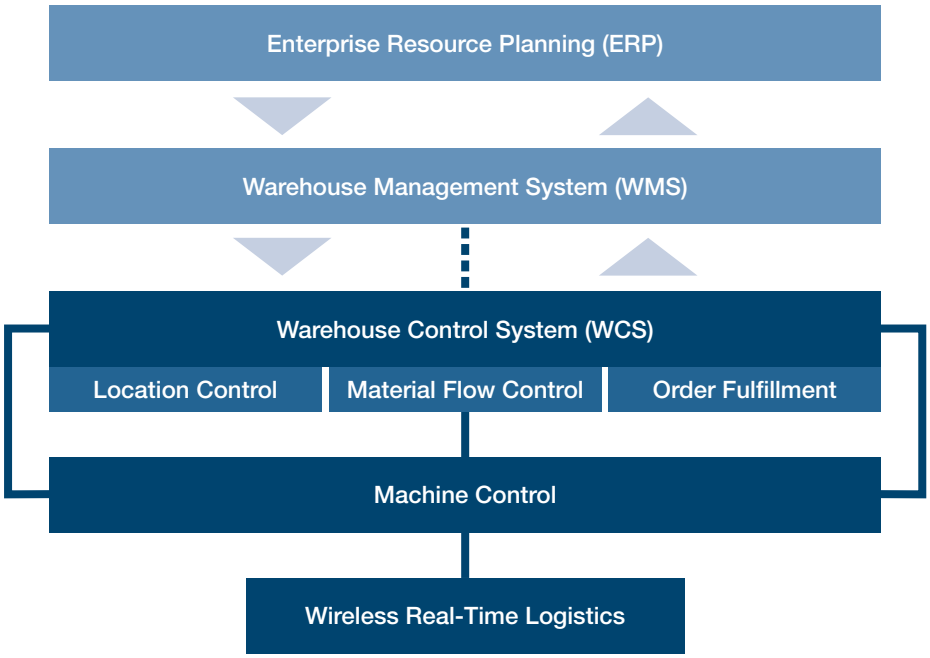
Potential legislative changes concerning the traceability of manufactured goods, along with retailer requirements, will lead to a greater need for track and trace in manufacturing logistics applications.

Efficient material flow and control requires real-time data communications.

This functionality is provided via the Warehouse Control System (WCS), which interfaces with the Warehouse Management System (WMS) and/or the Enterprise Resource Planning (ERP) system.

The WCS communicates in real-time with all of the various sub-system elements, such as package handling and unit load handling conveyors, automated storage and retrieval systems (AS/RS), sorters, palletizers and the like, and is responsible for location control, material flow control and order fulfillment.

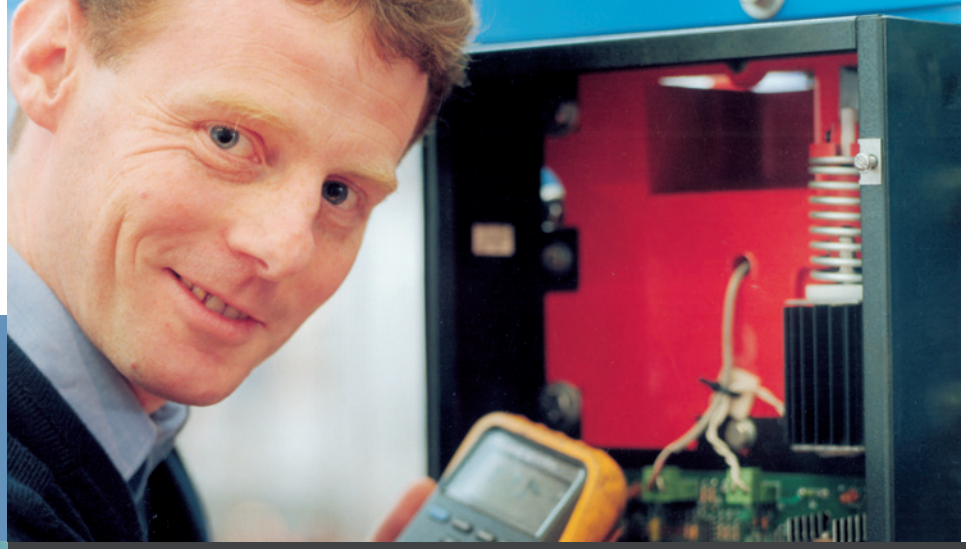
Wireless real-time data communications including Radio Frequency (RF) systems and Voice-Directed Computing may also be interfaced to the WCS, or directly to the WMS, if it is real-time enabled.



Seamless integration of technologies and software provides a single user interface for effective logistics management and control.

DEMATIC
SPROCKET
ENTERPRISE ASSET MANAGEMENT

Dematic
24/7 Service
& Support



Dematic Sprocket: your lifecycle partner delivering value

Dematic Maintenance Services

- Technical phone support
- Spare parts services
- Equipment condition assessment
- Preventative maintenance
- Scheduled repairs
- Emergency service
- Supplemental resident support
- Equipment safety assessment
- Training
- Software and hardware support
- Radio frequency wireless support

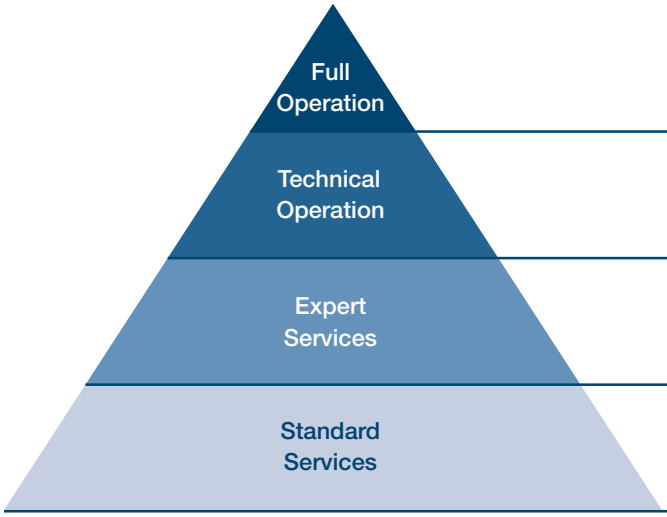
As logistics systems become more complex and sophisticated, so too does the task of maintaining their performance.

Dematic has the expertise and capabilities to optimize the efficiency of those systems throughout their many years of operation at the lowest total cost.

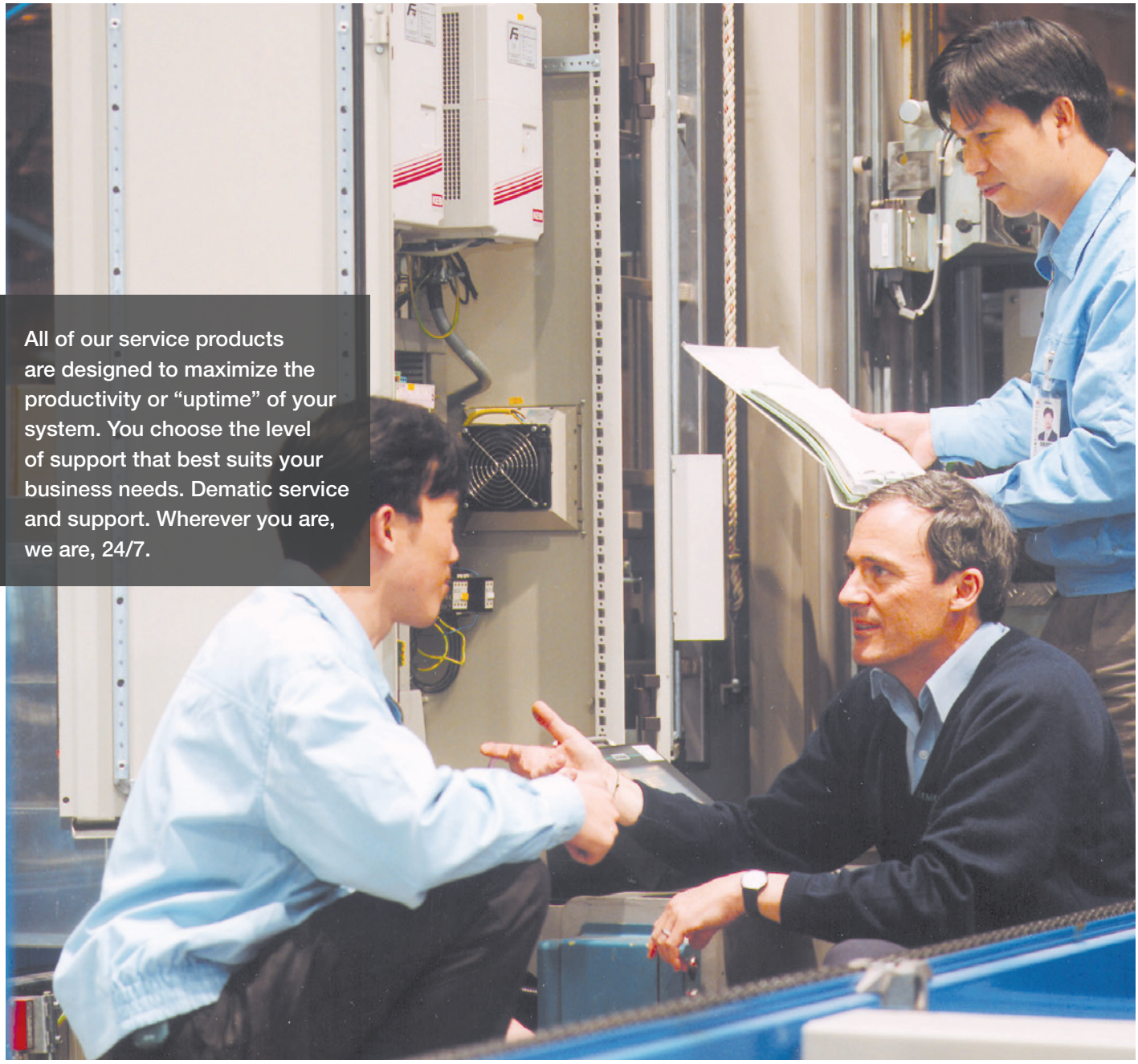
The key to maximizing the efficiency of service operations is not to spend more money on service, it is about spending more money on the areas which need it and less on those that don't.

Because no two systems are the same, and no two customers have the same requirements, we tailor service programs to meet mutually agreed performance and cost goals.

For some customers, this means we fulfill a total system support role, while for others we supplement their own in-house maintenance personnel.



Full Operation	All Facility Operations and Management	
Technical Operation	Material Handling Systems Operation Control Room Management Incident Resolution	
Expert Services	Modernisation/Upgrades Consulting Training	Predictive Maintenance Launch Support
Standard Services	Operational Support Preventative Maintenance Emergency Service	Spare Parts Technical Phone Support Personnel Despatch



All of our service products are designed to maximize the productivity or “uptime” of your system. You choose the level of support that best suits your business needs. Dematic service and support. Wherever you are, we are, 24/7.

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