



# Robot Mini-load<sup>TM</sup>

Intelligent logistics system, solutions for buffering, temporary storage, 'goods to person'.



2018 V1.0

**Damon**  
*Damon Simplifies Logistics*

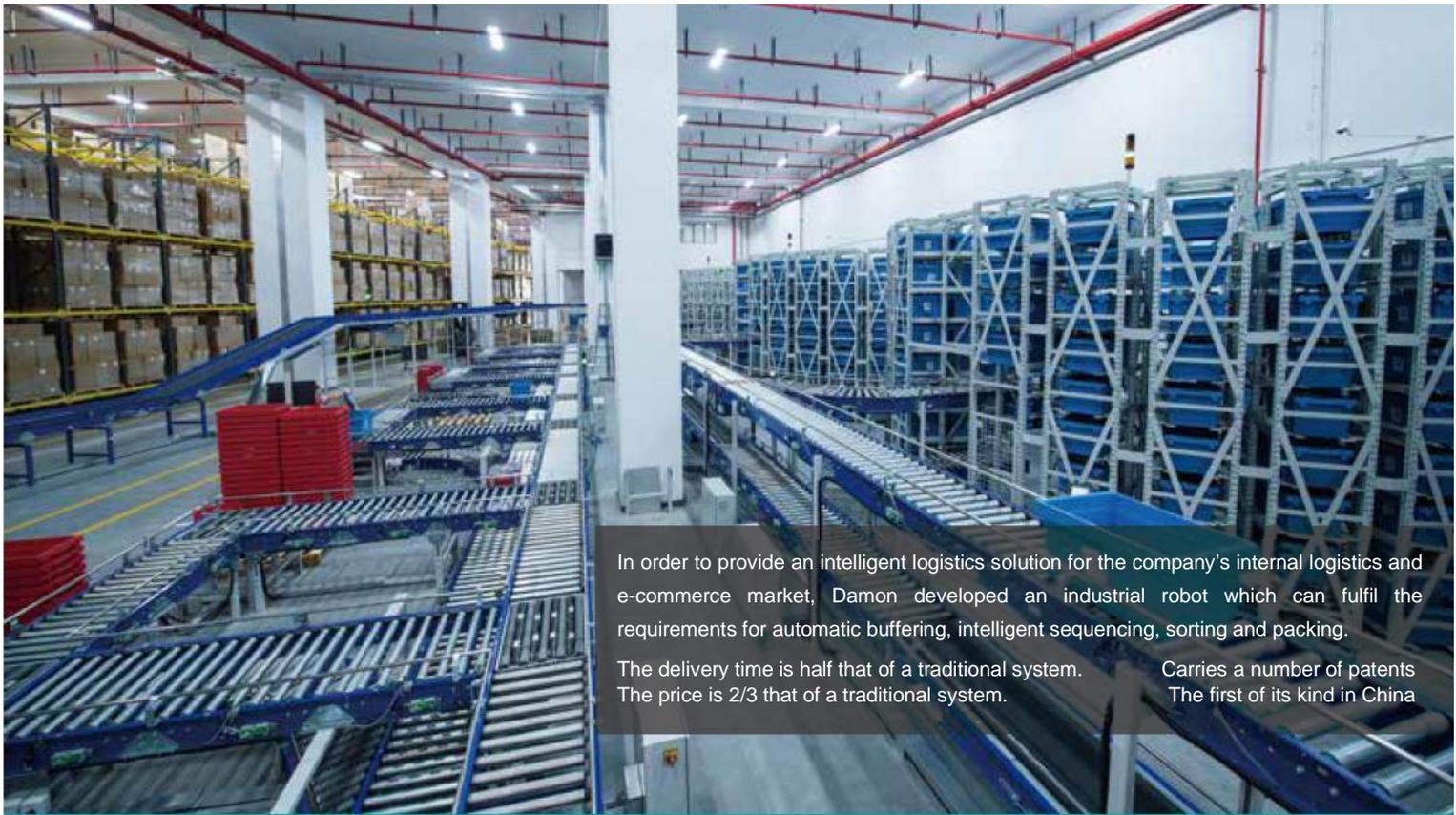


## If your focus is on factory manufacturing, you may encounter the following problems

1. All kinds of semi-finished products are randomly stacked and cannot be quickly taken out into the next procedure.
2. The discontinuation rate between procedures is very high with no means of intelligent docking.
3. The efficiency and fluency of material supply is very low and is unable to achieve automatic stocking.
4. The illogical layout of the logistics buffer area leads to the increase in handling costs.

## If your focus is on logistic centres, you may have questions as listed below:

1. How to achieve automatic buffering and intelligent sequencing with less space and labour when dealing with sorting items.
2. How to reduce the walking distance in the warehouse in order to make sorting times shorter and meet the high demands of processing orders.
3. How to safely store luxury products with a small number of SKU's.



In order to provide an intelligent logistics solution for the company's internal logistics and e-commerce market, Damon developed an industrial robot which can fulfil the requirements for automatic buffering, intelligent sequencing, sorting and packing.

The delivery time is half that of a traditional system.  
The price is 2/3 that of a traditional system.

Carries a number of patents  
The first of its kind in China

## Robot Mini Load

### Automated totes warehouse

The Robot Mini Load is an automated totes warehousing system with a modular design. It provides manufacturing with an in-plant logistics service and may also be applied to e-commerce distribution centres who handle totes to provide buffering and intelligent sequencing. The system is comprised of a standard industrial robot, multi layer shelving, position and safety sensors, conveyor lines and interface with the WCS. It features unmanned operation, lower operating costs, fast delivery time, high efficiency and flexibility.

- Unmanned operation

Through the seamless connection with high level warehousing computer systems, the Robot Mini Load with its inbuilt WCS system, can perform pick and storage operations directly. The entire process is unmanned thereby saving labour costs.

- Low cost

The standard six axis industrial robot and circular shelving construction cost is 2/3 of a traditional system.

- Fast delivery time

Standardized, mass production of core devices reduces the delivery time to half that of a traditional system.

- High efficiency

High speed operation with 380 cycles/hour. When commonly sized totes are utilized, product throughput levels of up to 280 totes/hr for inputs and 600 totes/hr for outputs can be achieved.

- Maintenance friendly

The core device, the industrial robot, is of standard manufacture so technical support is readily accessible with a large number of technicians available for maintenance and service. The total cost of ownership during its lifecycle is much lower than non-standard equipment.

- Flexible

Due to its modular design, it is possible to employ parallel operation of multiple systems. It is suitable for small and medium manufacturing companies to solve problems with buffering. Large systems can be realized by parallel operation of multiple Mini Load systems.

### Specifications

Content	Specification
Typical tote size	600 x 400 x 370 (Customisable)
Max weight (including tote)	35kg
Power	13kW
Handling capacity	Input: 280 totes / hr (one tote per cycle) 560 totes / hr (two totes per cycle) Output: 300 totes / hr (one tote per cycle) 600 totes / hr (two totes per cycle)
Locations	500 (Customisable)
Positioning accuracy	±0.05mm (XYZ)
Robot run time without failure	40,000 hours



## APPLICATIONS

### Intelligent manufacturing

#### Shenzhou International – Garments

This project employs a solution which includes the Robot Mini-Load system, fabric loading system, lift type AGV's, SLAM type AGV's and carton conveyor lines. The overall process of material supply including the automatic storage of cloth on pallets, intelligent removal of cloth and automatic delivery of clothes from storage is fully automatic. The solution provides improved fluency between processes, reduces error rates and waste due to handling, ensures optimum production line efficiency and removes production downtime.

The plant is transformed from traditional labour intensive manufacturing to Industry 4.0 of intelligent manufacturing.

#### Features:

- (1) The seamless connection between the WMS, WCS and MES systems create a complete intelligent manufacturing and logistics system.
- (2) With the combination of a high level of intelligence and information, robots, AGV's, intelligent warehouse and automated conveyor lines, a model of the future Smart factory has been created.

### Samsonite

#### Luggage Manufacturing

The Robot Mini-Load system developed by Damon has been adopted by Samsonite, the internationally renowned brand in luggage, in their new logistics centre in China. The system is used for buffering products and provides goods to person delivery. The five sets of Robot Mini-Load systems operate in parallel although each system has the ability to operate independently which significantly improves the operational reliability of the overall system. The high operating efficiency of this system meets the requirements of various operating modes.

#### Application note:

The Robot Mini-Load is designed to provide a flexible connection between procedures with less than 2000 SKU's

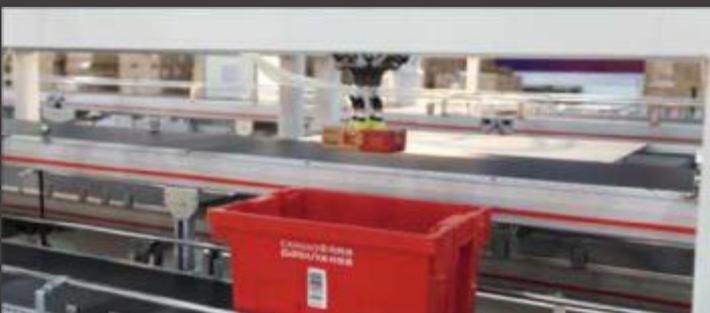


## APPLICATIONS

### Cainiao Network - Haining Unmanned Warehouse

Cainiao Network is a joint venture worth 7.7 billion in which Alibaba has a 47% stake. They built their unmanned robotic warehouse in Haining. The project includes the Robot Mini-Load system, automated robot picking system, intelligent robot transportation and sorting system and various associated sub-systems. The Robot Mini-Load system achieves three functions including storage, sorting and distribution which accounts for 80% of the operating procedures in the warehouse. It is the first unmanned robotic warehouse system in China.

The system utilises advanced technologies such as 3D visual recognition and high speed computational motion planning which helps to achieve intelligent, high speed sorting and completely replaces manual labour and eliminates errors. This is a typical example of intelligent goods to person picking.



### JD.com Logistics Centre Asia's No. 1 E-commerce Company

The Robot Mini-Load meets the functional requirements for distribution, merging and buffering a huge volume of totes. The totes merge into the Robot Mini-Load system for buffering. After the tote is scanned by the barcode reader, the WMS receives information on the tote identification number and applies for a storage location. Upon receiving the storage location from the WMS, the tote buffering system will deliver the tote to the defined location for temporary storage. If the message from the WMS is abnormal, audible and visual alarms will operate and the tote will be ejected for manual processing.

#### Features:

- (1) Fast delivery. A complete system can be on-line for commissioning in only four months.
- (2) High, comprehensive efficiency of the entire system.
- (3) It offers a saving in space and labour costs compared with a traditional conveyor system.

#### Application note:

The Robot Mini-Load system is suitable for e-commerce centres with large warehouse operations and B2C companies with over 1000 orders per hour. It is also suitable for B2B for order picking and consolidation.



Damon, a listed company on the Beijing Stock Exchange (stock code: 830805 Damon Science and Technology), is a leading intelligent logistics system and equipment provider in China. Damon focuses on intelligent logistics conveying and sorting systems including product research and development, manufacturing and project services. Damon serves the e-commerce, courier, clothing, pharmaceutical, manufacturing and other various industries to improve the competitiveness of our customer's logistics systems which always receives wide acclaim.

[www.damon-group.com](http://www.damon-group.com)

Damon Australia Pty. Ltd.  
30 Grasslands Avenue  
CRAIGIEBURN VIC 3064  
Australia

P: +61 3 9333 7034  
F: +61 3 9308 4896  
E: [info@damon-group.com.au](mailto:info@damon-group.com.au)  
[www.damon-group.com.au](http://www.damon-group.com.au)