

## APPLICATION

Application in E-commerce logistics center  
Asia No. 1 distribution center of JD.com

Robot Mini-load system is used in this project. This system meets the functional requirements for distributary, merging and buffer, when dealing with huge volume of totes. The totes merge into the Robot Mini-load system for buffering. After the tote is scanned by BRC, the WMS gets the feedback on the tote number and applies for the storage location. After receiving the position feedback from WMS, the totes buffering system will deliver totes to the defined location for temporary storage. If the feedback from WMS is abnormal, the audible and visual alarm will kicked the items out for manual processing.

Features:

- (1). Fast delivery. A complete on-line commissioning takes only 4 months.
- (2). High comprehensive efficiency of the whole system. The storage capacity achieves 500 cases per set. The throughput capacity reaches 400 cases per hour.
- (3). Compared with traditional conveyor line and artificial merging, it saves the space and labor cost.

Application:

Robot Mini-load System is suitable for the E-commerce center with large area of warehouse operation, crossing multiple-area and B2C business with over 1000 orders per hour. It is also suitable for B2B business of orders picking and consolidation.

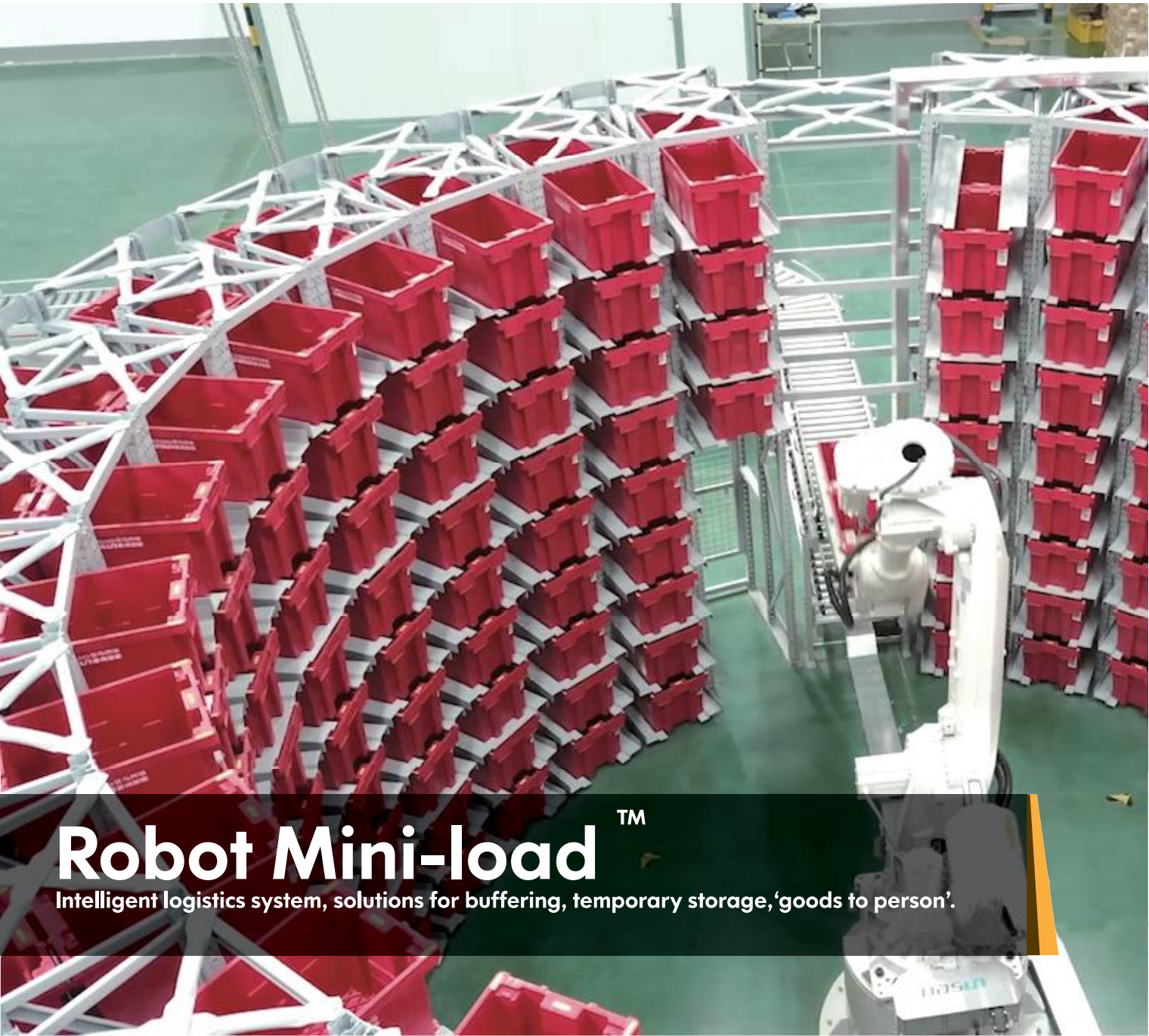


# DASUN

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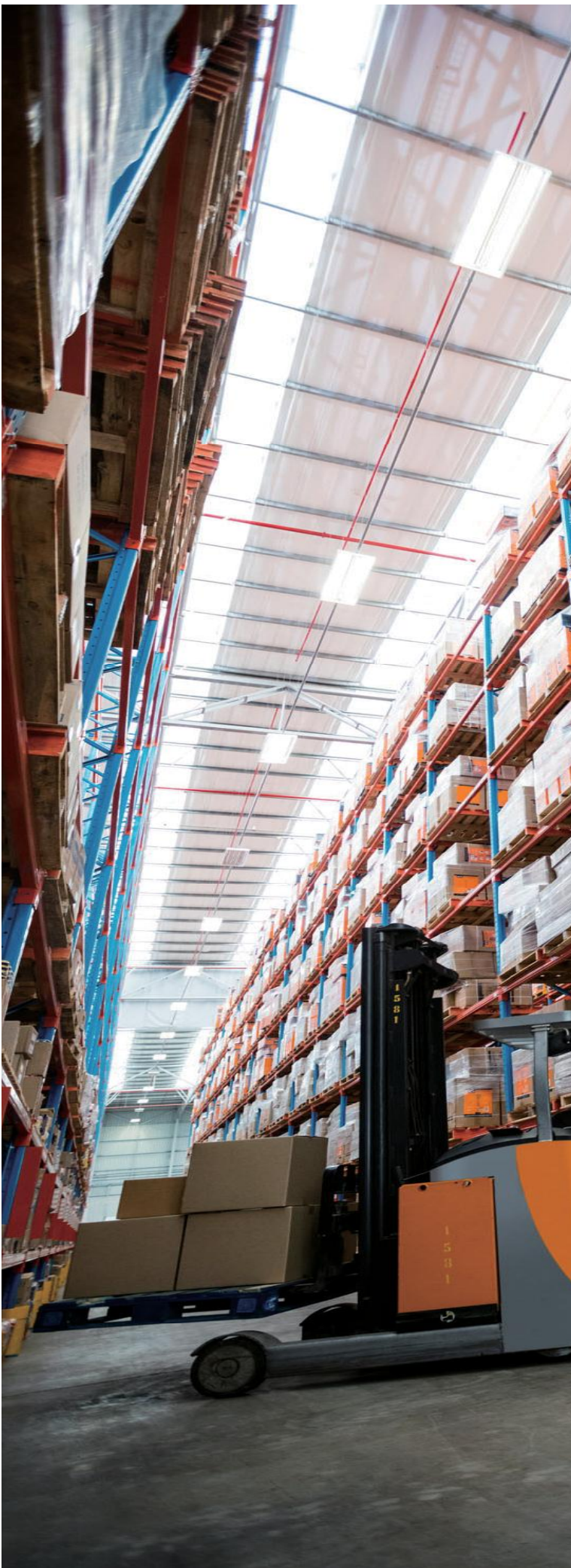
# Robot Mini-load<sup>TM</sup>

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

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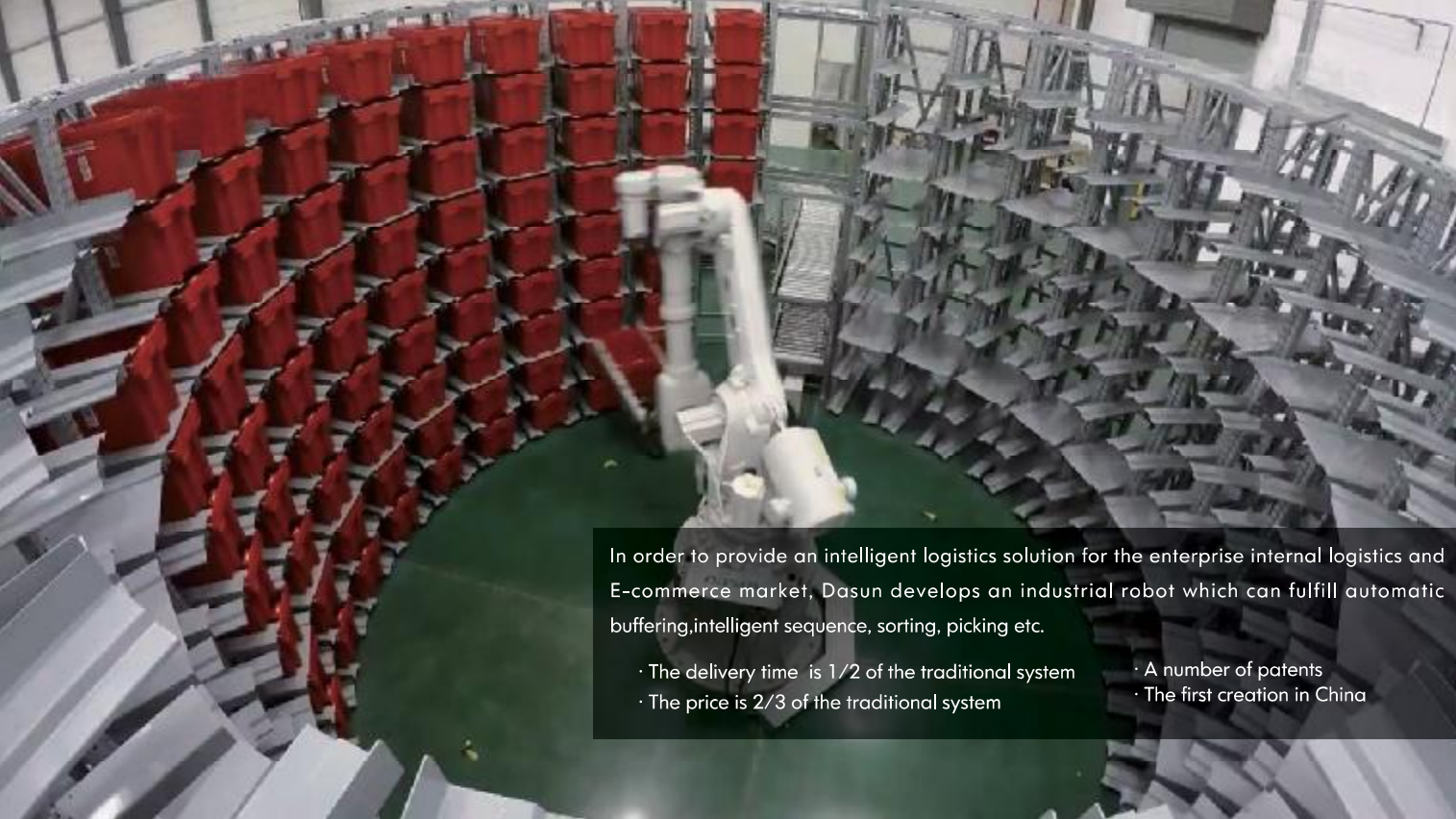


If you focus on factory manufacturing, you may encounter the following questions:

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

If you focus on the logistics center, you may have the problems as below:

1. How to achieve automatic buffer and intelligent sequence with less space and labor when deal with items sorting.
2. How to reduce the walking distance in the warehouse, in order to make sorting time shorter and meet more demands of order.
3. How to store luxury products with small amount of SKU and safety protection.



In order to provide an intelligent logistics solution for the enterprise internal logistics and E-commerce market, Dasun develops an industrial robot which can fulfill automatic buffering,intelligent sequence, sorting, picking etc.

- The delivery time is 1/2 of the traditional system
- The price is 2/3 of the traditional system
- A number of patents
- The first creation in China

## Robot Mini-load

### Automated totes warehouse

Robot Mini-load is an automated totes warehouse system with modular design.It provides the manufacturing in-plant logistics service and is also appliedto E-commerce distribution center dealing with the totes problemssuch as buffering and intelligent sequence. This system is composed ofthe standard industrial robots, multilayer shelves,position andsafety sensors, conveyor lines and WCS etc. It isfeatured with theunmanned operation, lower cost, best deliverytime, high efficiency,flexibility and friendly maintenance.

#### ● Unmanned operation

Through the seamless connection with upper system, the system and its build-in WCS system can do storage and pickupoperations directly .The whole process is unmanned and saves manpower.

#### ● Low cost

The standard six-axis industrial robot and loop shelves construction make the total cost is 2/3 of the existing system.

#### ● Best delivery time

Standardized mass production of core devices makes thedelivery time is 1/2 of the traditional system.

#### ● High efficiency

High-speed operation with 380circles/h. When E-commerce commonly used totes are employed, product throughput levels of up to input 280totes/h and output 600totes/h can be reached. What's more, higher throughput can be achieved by multi-group parallel operation.

#### ● Friendly maintenance

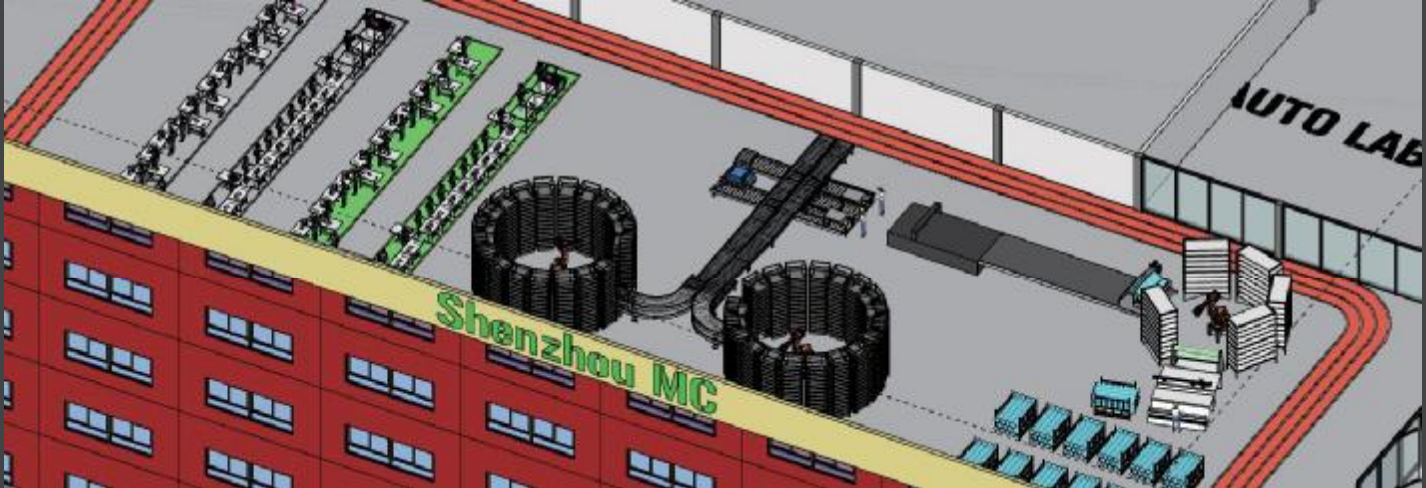
The core device, industrial Robot, is featured with standardized production, easy accessible technical support, large amount of technicians and easy maintenance. The total cost during the lifetime is much lower than the non-standard equipment.

#### ● Flexibility

It's possible to achieve the parallel operation of random multi-group systems due to the fullmodular design. It is very suitable for the small and medium manufacturing enterprise to solve the buffering problems.Lagre system can be achieved by parallel operation of multi-miniload system.

### Main technical parameters

Project	Parameters
Typical tote size	600*400*370 (Customizable)
Max weight incl.tote	35kg
Power	13kW
Efficiency	Input:280totes/h (One tote per cycle)
	560totes/h (Two tote per cycle)
	Output:300totes/h (One tote per cycle)
	600totes/h (Two tote per cycle)
Locations	500 (Customizable)
Positioning accuracy	±0.05mm (XYZ)
Robot running time withoutfailure	400000h



## APPLICATION

Application of intelligent manufacturing  
Shenzhou International —— garment

This project employs solutions composed of Robot Miniload System, fabric loading system, lift-type AGV, SLAM AGV, carton-type conveyor line etc. The overall process of material supply, including the automatic storage of cloth pallet, intelligent cloth doffing and automatic delivery the clothes from the storage, is automatic and intelligent. It also improves the fluency between processes, reduces the waste of handling and error rate of delivery, ensures optimal production line efficiency and avoids the production waste due to downtime.

Inventory information between MES and WMS is connected. WMS updates the corresponding tasks according to the WCS' feedback on task states. Conveyor and AGV the tasks issued by WCS and give the feedback on task execution status to WCS system, then the feedback information returns to WMS. We

integrate the logistics, process flow and information flow together, and transform the plant from traditional labor-intensive manufacturing to Industry 4.0 of intelligent manufacturing.

#### Features:

- (1). Fast delivery. It takes only 4 months to complete online commissioning.
- (2). High efficiency. Automation and informatization makes production to be effectively controlled. It also reduces waiting time and handling waste.

#### Application:

It is designed for application in flexible connection between procedures with less than 2000 items SKUs and high buffer capacity in intelligent factories.