## Medical Instruments AS/RS Project

Zhuhai

This project covers an area of 6,400 ㎡, designed with 10,500 locations. The project applies SRM system, pallet conveyor system, dual-station RGV handling system, WMS/WCS, etc., to achieve the automated storage of medical package excipients.

## Pharmaceutical Production Support AS/RS Project

Heze

This project is designed with 5,540 locations, applying AS/RS system, pallet conveying system, AGV material automatic handling system, RGV system, DWS, WMS, WCS and other computer software and hardware control systems, to achieve integration automated processes of whole pallet inbound, outbound, empty pallet handling and outbound picking.



## Medical Instruments AS/RS Project

Shandong

This project is divided into storage area, online picking area and dispatching buffer area. The storage area is equipped with 4,800 locations and 5 sets SRM, with a length of about 70 m and a width of about 27 m. The online picking area consists of order picking, receiving, temporary storage and warehousing, with a length of about 30 m and a width of about 27 m. The delivery buffer area is the order collection and delivery area. Through information automation and fine management, the functions of online sorting, human-machine interaction, automatic inventory and other functions are achieved, which guide and standardize the daily operations of warehouse personnel, better integrate warehouse resources, and help accelerate the automation of storage logistics for customer.

## Pipeline Production Support AS/RS Project

Huzhou

This project applies SRM system, cage conveying system, shuttle system, DWS, WCS/WMS, etc., which achieves integration automated processes of the whole pallet inbound, outbound, cage conveying, online picking, size and weight inspection.

## Auto Parts AS/RS Project

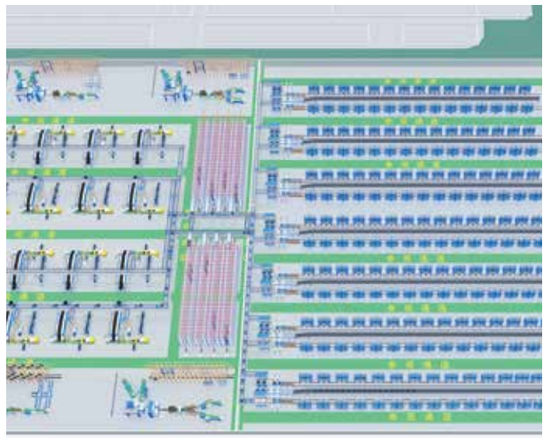
Huizhou

This project is divided into a miniload storage area and a pallet storage area, applying SRM system, miniload system, carton conveyor system, pallet conveyor system, shuttle handling system, etc., which is a representative project of intelligent storage in the automobile industry.

## Gear Raw Meterial AS/RS Project

Zhuzhou

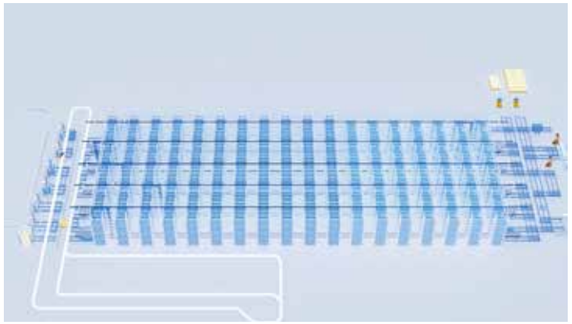
This project is mainly divided into four areas: pallet AS/RS, conveyor line distribution, second level online conveying and tote AS/RS, applying SRM system, pallet conveyor system, carton conveyor system, pallet lifting system, tote lifting system, electrical control system and WAS to achieve intelligent automation of gear machining, assembly, conveying, warehousing and final assembly.



## All-steel Radial Tire AS/RS Project

Qingdao

This project includes rubber storage, workshop storage, green tire storage and finished tire storage, which achieves the automatic inbound and outbound transportation of all-steel compact rubber, all-steel carcass and other semi-components, all-steel green tire and all-steel finished tire.



## Auto Parts AS/RS Project

Shandong

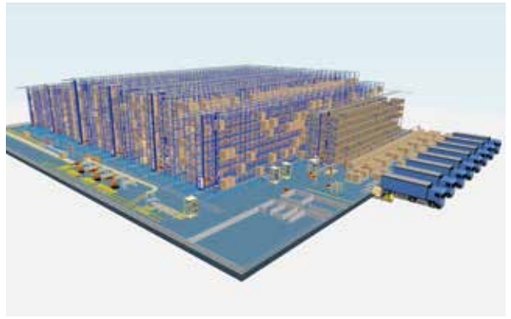
This project is designed with 2,240 locations. The project applies SRM system, pallet conveor system, RGV handling system, depalletizing robot system, electrical control system, WAS/WMS, etc. to achieve the automated storage of finished parts and other tire materials in the final assembly workshop.

## Food Industry AS/RS Project

Thailand

This project designed with 2,016 locations, applies double-deep SRM system, pallet conveyor system, DWS, control system, etc. to realize the automated storage of food goods.

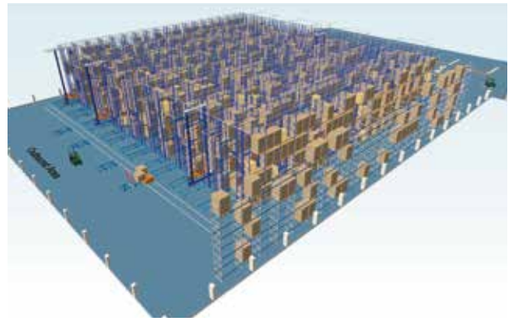




## Paper Industry AS/RS Project

Thailand

This project designed with 4,588 locations, applies double-deep SRM system, pallet conveyor system, RGV handling system, control system, etc. to realize the automated storage of paper goods.



## Home Appliance AS/RS Project

Thailand

This project designed with 15,372 locations, applies SRM system, pallet conveyor system, AGV handling system, three-station RGV handling system, control system, WMS/WCS, etc. to realize the automated storage of home appliance goods.

## Cold Chain AS/RS Project

Thailand

This project designed with 7,000 locations and ambient temperature of -25°C, applies SRM system, carton conveyor system, AGV handling system, software control system, etc., to realize  the automated storage of frozen food.

# Intelligent Manufacturing Solution

## Overview

Intelligent Manufacturing Solution is organic integration of automatic equipment and information software throughout the whole manufacturing process,it can realize standardization and optimization of the manufacturing process to ensure the life-time and real-time track of each product and provide all-level data for the management.

## Key Equipment

AS/RS

Multi-shuttle Rack

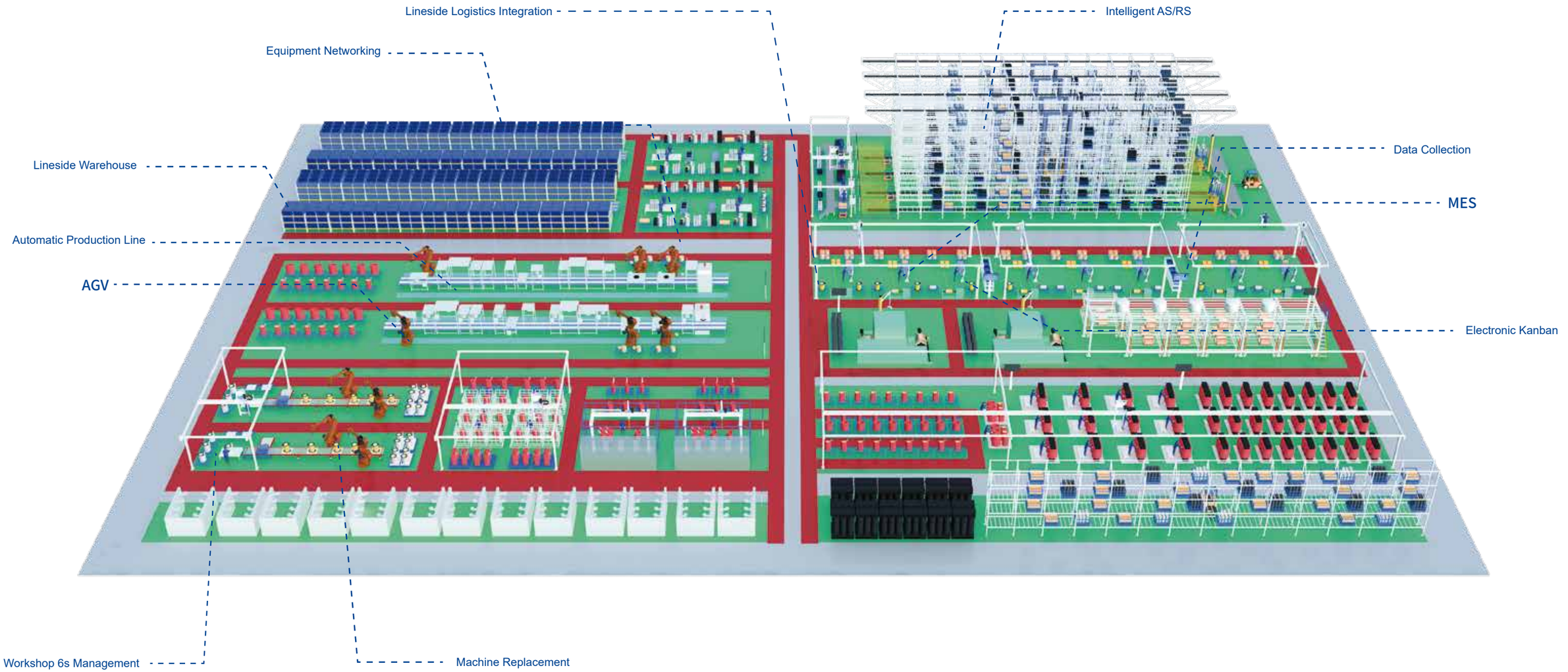
Four-way Multi-shuttle AS/RS

Feeding and Picking Equipment

(AGV/EMS/RGV) / Discontinuous Conveying Equipment ( AGV / EMS / RGV )

Continuous Conveying Equipment ( All Types of Standard / Non-standard Customized Conveyor )

Customized Equipment



## General Methodology for Intelligent Manufacturing

### Strategic Understanding

- Understand the customer's existing business
- Analyze the source drivers of change
- Define your business requirements for Intelligent manufacturing
- Analyze the application trends of new technology
- Conceptualize service scenarios
- Define the intelligent manufacturing vision and development goals

### Intelligent Manufacturing Maturity Assessment

- Select the scope of application of the intelligent manufacturing theme
- Select evaluation domain
- Create questions based on evaluation items and maturity level
- Interview based on questions and scoring
- Aggregate scores and give grades
- Analyze the gap with the benchmark

### Intelligent Manufacturing Technology System Architecture

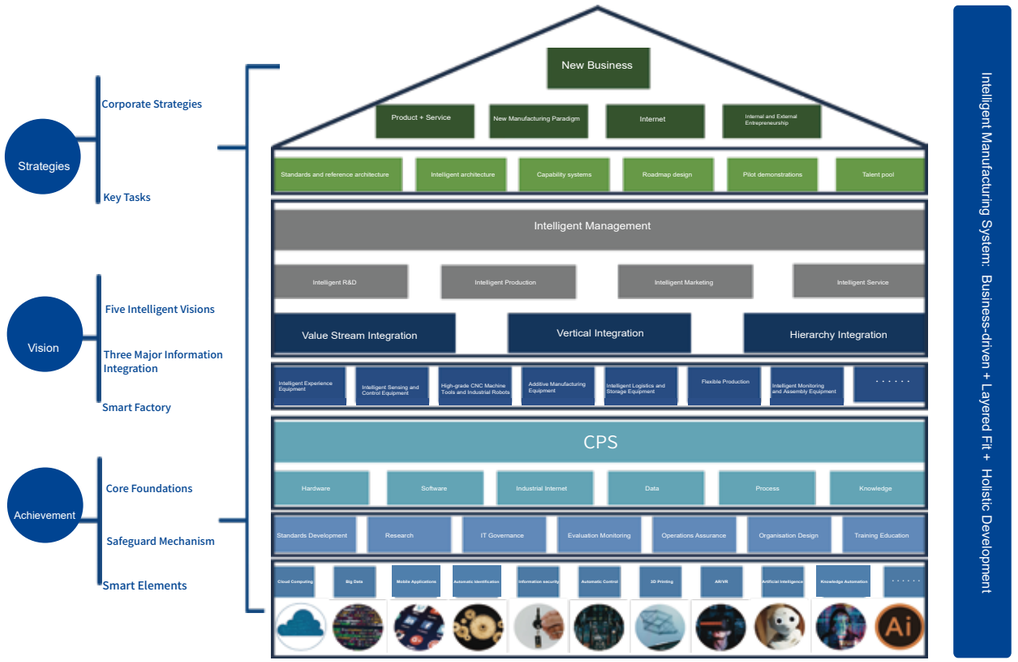
- Design an intelligent manufacturing business architecture
- Design a holistic competence system
- Define the technical architecture
- Define change solutions in terms of process, IT and organizational dimensions
- Process and IT panorama
- Intelligent manufacturing infrastructure architecture
- Develop roadmap for change

### Develop roadmap and implement sub-projects

- Define the roadmap of intelligent manufacturing development
- Define project priorities in multiple dimensions
- Develop the sub-projects
- Refine sub-project future scenarios
- Implement sub-projects and demonstrate value



## Analysis of Framework of Intelligent Manufacturing

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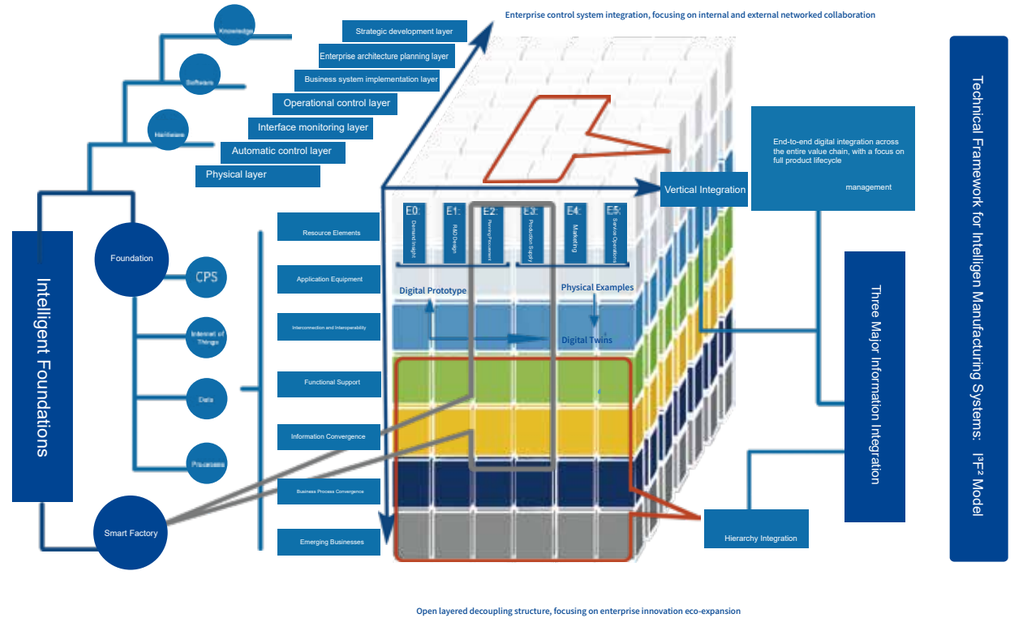
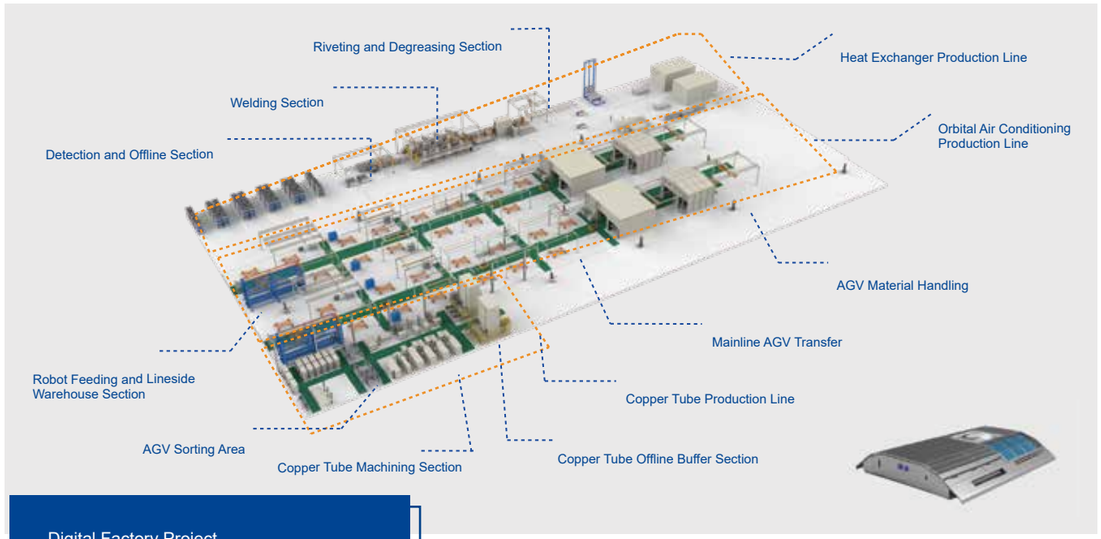





## Digital Factory Project

Qingdao

This project addresses how Longertek faces the problem of crossing the digital industry cycle and stepping into big data, cloud technology and AI. By building customized IT process software such as CRM, SCM, MES, WMS as the carrier and using the method of collaborative distribution of resources and path optimization with flexible layout of multiple workstations, KENGIC opens up the horizontal integration of Longertek's end-to-end business and vertical integration of enterprise internal data, thus realizing the flexibility, transparency, visualization and intelligence of the rail air-conditioning production process, achieving platform operation, operation and maintenance service and intelligent decision-making, and opening a demonstration application for the digital factory of the rail air-conditioning industry.

## Door Handle Multifunctional Intelligent Production Line and Grinding Line Project

Guangxi

This project adopts non-standard customized robots, manipulators, belt conveyors, full set of electronic control systems, etc.to achieve the automation of infeeding,  bending detection, drilling and tapping,intelligent grinding and conveying.

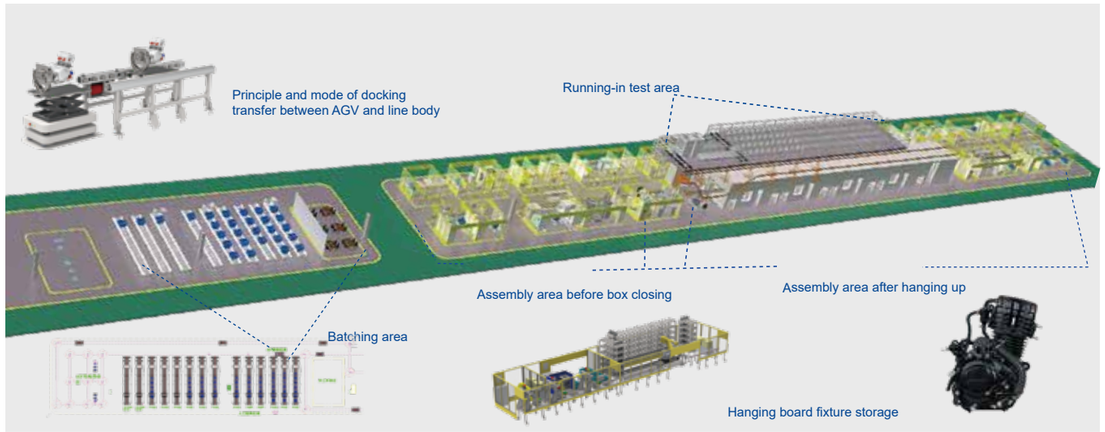
## OBM Assembly Production Line Project

Hebei

This project is mainly composed of double-deck with double-speed chain conveyor body, translation mechanism, blocking mechanism, end lifting mechanism, detection buffer station, and control system. These achieve the automatic transportation and transfer of workpieces between assembly and inspection stations, and automatic stop at related stations, which is convenient for personnel assembly operations and inspections.

## Large Displacement Engine Intelligent Production Line Project

Chongqing




The project is based on the concept of modular workstation layout design, its information system represented by IT software such as MES, WMS, WCS, TCS, SCADA, PCS, etc., is compatible with the mixed-line flexible production of 5 platforms and 8 engine models, realizing order issuance, plan execution, material distribution, tracking, error prevention, process curing, equipment monitoring, important data collection, worker management, energy monitoring, etc. to meet the whole life cycle management of customer and products, self-diagnostic maintenance of equipment in order to achieve the optimal allocation of manufacturing resources such as human, machine, material, method and environment in the assembly line.

## Machine Pulsating Line Intelligent Production Line Project

Qingdao

This project adopted line planning, using RGV and AGV material handling equipment and supporting software scheduling system to realize the automation of framework platform transfer, line transfer, finished product offline transfer, finished product storage and other processes.

## Robotic Automation Project

Chongqing

This project process automation of loading, milling, transfer, laser distance measurement and unloading is achieved by automatic grasping of robot arm and supporting electrical control system.

## Cylinder Parts Transferring and Depalletizing Logistics Line Project

Shanghai

This project planned and designed a flexible logistics line for Festo through 4 dimensions of automation + information + flexible production + lean operation to realize the automatic buffering, sorting, conveying, palletizing and transferring of material flow in PH1A and PH1B workshops.

## Intelligent Manufacturing（MES）Project

Shanghai

Hangzhou

Shanghai

This project takes MES as the core to realize intelligent manufacturing. Through MES integration of ERP, the whole process tracking (including raw material receiving, inventory, weighing, batching, feeding, preparation, packaging, warehousing) realizes the automation of the production process (preparation, packaging) and creates an automated logistics system ( automation distribution of raw materials, semi-finished products and finished products ). The project includes 86 user terminals, 6 servers and real-time equipment control and real-time production management, and provides technical data for other systems. The whole process is informationized and paperless, shortening reaction time, dealing with abnormalities in time and improving product quality through data analysis.

# Product and Service

## Storage Product

### SRM

#### Feature

- High Running Speed
- Modular and Lightweight Structural Design
- High Load Capacity
- Flexible Control
- High Safety of Use and Ease of Maintenance

#### Application Scenario

It applies for automated storage warehouses for production logistics and distribution logistics,such as various raw materials, semi-finished products, finished products, and distribution centers' AS/RS project.

Tote SRM

Pallet SRM

High-speed SRM

#### Product Specification

| SRM Series | Goods Size ( mm ) | Load ( kg ) | Height ( m ) | Max.Speed( m/min ) | | | Address Recognition Accuracy | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Travelling | Lifting | Fork | X-direction | Y-direction | Z-direction |
| Toto Series | 400 ～ 600 L<br>400 ~ 600 W | 100 | 10~20<br>Customizable | 360 | 120 | 60 | ± 2 mm | | |
| Pallet Series | 1100 ～ 1500 L<br>1100 ~ 1500 W | 100~5000 | 40<br>Customizable | 240 | 90 | 60 | ± 3 mm | | |
| High-speed Series | Acceleration Speed<br>1.0 m/s² | Load ( kg )<br>1500 | Stopping Accuracy<br>1 mm | 240 | 90 | 60 | ± 5 mm | ± 5 mm | ± 3 mm |



### Multi-shuttle

#### Feature

- High Walking Speed
- Stable Operation
- High Positioning Accuracy
- Modular Control System
- High Charging Efficiency

#### Application Scenario

It is suitable for dense storage environments with many sizes of goods, large batches, high-frequency picking and unpicking needs or special environments such as low temperature and danger, and can maximize the use of space.

#### Product Specification

| | | | |
|---|---|---|---|
| Mode | Single-deep / Double-deep / Clip Hold Type | Acceleration Speed | 2 m/s² |
| Max. Load | 50 kg | Max. Speed | 5 m/s |
| Communication Mode | Wireless TCP / IP | Applicable Goods Type | Plastic / Carton etc |
| Internal Power Supplying Mode | Super-capacitor + Lithium Battery + Sliding Contact Wire | Walking Positioning Accuracy | ⩽±3mm |
| Applicable Temperature | -15°~45°C | Fork Positioning Accuracy | ⩽±2mm |

Sorting Product

## Loop Cross-belt Sorter

### Application Scenario

It is suitable for small and medium-sized sorting sites with high sorting efficiency requirements, less sorting directions and strict space requirements, and is widely used in express, e-commerce, garment, food, cosmetic, aviation and pharmaceutical industries.

### Feature

- Consists of a host of continuous carriers, track, induction, sorting tunnel, barcode scanner, communication system and power supply. system
- Double deck configuration doubles sorting efficiency while saving personnel and space.

### Product Specification

| Number of Sorter Layers | Specifications | Pitch of Carrier | Applicable Load Range | Max. Running Speed | Sorting Efficiency | Applicable Cargo Size Range(mm) |
|---|---|---|---|---|---|---|
| Single Deck | **KG-XB-650** | 500 mm | 0.03~20 kg | 2.1 m/s | ⩾ 25000 pcs/h | 150*100*1 ~ 500*400*250 |
| | **KG-XB-760** | 600 mm | 0.03~20 kg | 2.1 m/s | ⩾ 22000 pcs/h | 150*100*1 ~ 500*450*300 |
| | **KG-XB-880** | 800 mm | 0.1~35 kg | 3.0 m/s | ⩾ 22000 pcs/h | 150*100*10 ~ 700*650*500 |
| | **KG-XB-765** | 650 mm | 0.03~20 kg | 2.1 m/s | ⩾ 20000 pcs/h | 150*100*1 ~ 500*500*400 |
| | **KG-XB-1280** | 800 mm | 0.1~50 kg | 3.0 m/s | ⩾ 22000 pcs/h | 150*100*10 ~ 1000*700*700 |
| Double Deck | **KG-DXB-650** | 500 mm | 0.03~20 kg | 2.1 m/s | ⩾ 50000 pcs/h | 150*100*1 ~ 500*400*250 |
| | **KG-DXB-760** | 600 mm | 0.03~20 kg | 2.1 m/s | ⩾ 44000 pcs/h | 150*100*1 ~ 500*400*300 |
| | **KG-DXB-880** | 800 mm | 0.1~35 kg | 3.0 m/s | ⩾ 44000 pcs/h | 150*100*5 ~ 700*650*500 |
| | **KG-DXB-765** | 650 mm | 0.03~20 kg | 2.1 m/s | ⩾ 40000 pcs/h | 150*100*10 ~ 500*500*400 |
| | **KG-DXB-1280** | 800 mm | 0.1~50 kg | 3.0 m/s | ⩾ 44000 pcs/h | 150*100*10 ~ 1000*700*700 |
| Triple Deck | **KG-XBT-760** | 600 mm | 0.03~20 kg | 2.1 m/s | ⩾ 66000 pcs/h | 150*100*1 ~ 500*450*300 |
| Quadruple Deck | **KG-XBF-760** | 600 mm | 0.03~20 kg | 2.1 m/s | ⩾ 88000 pcs/h | 150*100*1 ~ 500*450*300 |

| | | | |
|---|---|---|---|
| Length of Sorter | Customized According to Customer' s Actual Situation | Power Supply Mode of Carrier | Non-contact Power Supply or Sliding Contact Wire Power Supply |
| Driven Mode of Mainframe | Standard Configuration Asynchronous Linear Motor Drive, Optional Synchronous Linear Drive | Working Environment | Temperature: - 5℃ ～ + 45℃<br>Relative Humidity: 40% ～ 90%<br>( Without Condensation )<br>Under Ultra-high or Low Temperature Conditions, Additional Thermostatic Measures Are Required |
| Driven Mode of Carrier Belt | Brushless DC Roller Driven,<br>Servo Motor / Servo Roller | | |
| Communication Mode of Carrier | RCoax Industrial Wireless Communication | Sorting Damage Rate | ≤ 0.01 % |
| Sorting Accuracy | ⩾ 99.99 % | Barcode Reading Rate | ≥ 99 %<br>(Bar Code Level ANSI B or Above) |
| System Availability | ⩾ 99.5 % | Certification | CE |
| Average Noise of The Complete Machine | < 72 dB | | |

One-carrier Two-belts Cross-belt Sorter

## Application Scenario

It is suitable for large and medium-sized sites with high sorting efficiency requirements, a large number of sorting directions, and simultaneous sorting of large and small goods, widely used in e-commerce, food, cosmetics, clothing, books, express delivery and other industries.

## Feature

- Consists of a host of continuous carriers, track, induction, sorting tunnel, barcode scanner, communication system and power supply system.
- Two independently powered belts are integrated in one carrier frame, and one or two carrier belts can be adaptively assigned according to the size of the goods.



## Product Specification

| Number of Sorter Layers | Specifications | Pitch of Carrier | Applicable Load Range | Max. Running Speed | Sorting Efficiency | Applicable Cargo Size Range(mm) |
|---|---|---|---|---|---|---|
| Single Deck | **KG-TXB-8120** | 1200 mm | 0.1~35 kg | 3.0 m/s | ⩾ 25000 pcs/h | 150*150*8 ~ 1000*700*700 |
| | **KG-TXB-15135** | 1350 mm | 0.1~60 kg | 3.0 m/s | ⩾ 25000 pcs/h | 150*100*10 ~ 1300*1100*1000 |
| Double Deck | **KG-DTXB-8120** | 1200 mm | 0.1~35 kg | 3.0 m/s | ⩾ 50000 pcs/h | 150*100*10 ~ 1000*700*500 |
| | **KG-DTXB-15135** | 1350 mm | 0.1~60 kg | 3.0 m/s | ⩾ 50000 pcs/h | 150*100*10 ~ 1300*1100*1000 |

| | | | |
|---|---|---|---|
| Length of Sorter | Customized According to Customer' s Actual Situation | Power Supply Mode of Carrier | Non-contact Power Supply or Sliding Contact Wire Power Supply |
| Driven Mode of Mainframe | Standard Configuration Asynchronous Linear Motor Drive, Optional Synchronous Linear Drive | Working Environment | Temperature: - 5℃ ～ + 45℃<br>Relative Humidity: 40 % ～ 90 %<br>( Without Condensation )<br>Under Ultra-high or Low Temperature Conditions, Additional Thermostatic Measures Are Required |
| Driven Mode of Carrier Belt | Brushless DC Roller Driven, Servo Motor / Servo Roller | | |
| Communication Mode of Carrier | RCoax Industrial Wireless Communication | Sorting Damage Rate | ≤ 0.01 % |
| Sorting Accuracy | ⩾ 99.99 % | Barcode Reading Rate | ≥ 99 %<br>(Bar Code Level ANSI B or Above) |
| System Availability | ⩾ 99.5 % | Certification | CE |
| Average Noise of The Complete Machine | < 72 dB | | |

Vertical Cross-belt Sorter

## Application Scenario

It applies for large and medium-sized sorting sites, widely used for express, e-commerce, furniture, garment, aviation, cosmetics and other industries.

## Feature

- Consists of a host of continuous carriers, track, induction, sorting tunnel, barcode scanner, communication system and power supply system.

- Modular structure design, space-saving and easy to install and maintain.

## Product Specification

| Specifications | KG-VXB-650 | KG-VXB-860 |
|---|---|---|
| Belt Width of Carrier | 370 mm | 535 mm |
| Length of Carrier | 660 mm | 860 mm |
| Pitch of Carrier | 500 mm | 600 mm |
| Applicable Load Range | 0.03~15 kg | 0.1~30 kg |
| Applicable Cargo Size Range (mm) | 150*100*1 mm ~ 500*400*300 mm | 150*100*10 mm~700*500*500 mm |
| Height of the Sorter Carrier Belt | 1900 mm | 2100 mm |
| Running Speed of Mainframe | Max.Speed:1.8 m/s | Max.Speed:1.8 m/s |
| Sorting Efficiency | Sorting Efficiency ≥ 11000 cph | Sorting Efficiency ≥ 11000 cph |

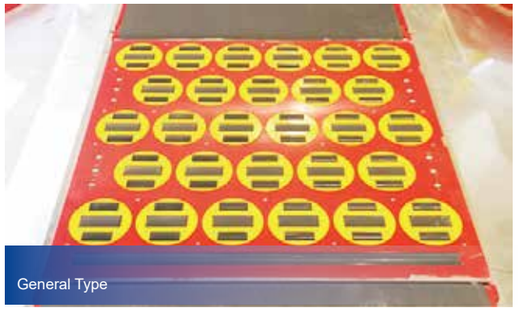
| | | | |
|---|---|---|---|
| Length of Sorter | Customized According to Customer' s Actual Situation | Power Supply Mode of Carrier | Non-contact Power Supply or Sliding Contact Wire Power Supply |
| Driven Mode of Mainframe | Standard Configuration Asynchronous Linear Motor Drive, Optional Synchronous Linear Drive | Working Environment | Temperature: - 5℃ ～ + 45℃<br>Relative Humidity: 40 % ～ 90 %<br>( Without Condensation )<br>Under Ultra-high or Low Temperature Conditions, Additional Thermostatic Measures Are Required= |
| Driven Mode of Carrier Belt | Brushless DC Roller Driven,<br>Servo Motor / Servo Roller | | |
| Communication Mode of Carrier | RCoax Industrial Wireless Communication | Sorting Damage Rate | ≤ 0.01 % |
| Sorting Accuracy | ⩾ 99.99 % | Barcode Reading Rate | ≥ 99 % （条码等级ANSI B级以上）<br>(Bar Code Level ANSI B or Above) |
| System Availability | ⩾ 99.5 % | Certification | CE |
| Average Noise of The Complete Machine | < 72 dB | | |

## Steerable Wheel Sorter

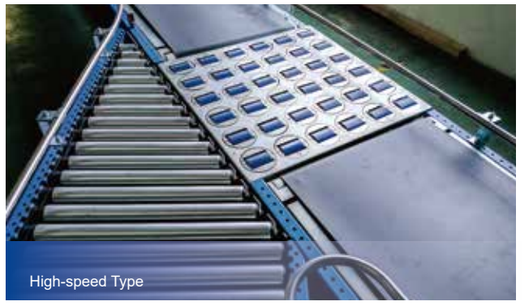
### Feature

- Fast and accurate sorting of goods on the main conveyor line to the corresponding branch conveyor by belt-driven wheel rotation.
- Can be used in conjunction with other conveying and sorting equipment to enhance the efficiency.
- Modular structure design, flexible application, the number of modules can be selected according to the size of the material.
- Suitable for a variety of packaging forms, such as cartons, totes, woven bags, plastic bags, etc.

### Product Specification



General Type



High-speed Type

| Model | KJ-SWS-201 | KJ-SWS-401 |
|---|---|---|
| Types | General Type | High-speed Type |
| Sorting Capability | 2500-6000 pcs/h<br>(The Highest Value is in a Particular State） | 2500-8000 pcs/h<br>(The Highest Value is in a Particular State) |
| Swing Angle Range | 45° | 45° |
| Width of The Device | 860 mm、1060 mm、1260 mm | 520 mm、620 mm、720 mm、820 mm |
| Height of The Device | (Min. )600 mm | (Min. )500 mm |
| Length of The Device | Depends On Pairs Number | Depends On Pairs Number |
| Goods Weight | 0.3 kg ~ 60 kg | 0.3 kg ~ 30 kg |
| Goods Type | Carton, Woven Bag, Parcel, etc. | Carton, Woven Bag, Parcel, etc. |
| Goods Size | (Max.)：1400（L）×1400（W）×800（H）<br>(Min.)：200（L）×200（W）×20（H） | (Max.)：1000（L）×800（W）×800（H）<br>(Min.)：150（L）×150（W）×20（H） |



## Parcel Singulation System

### Feature

- Mainly composed of scattering belt machine, separation belt machine and vision system.
- Support seamlessly docking all kinds of automatic sorting equipment to realize fully automatic transporting and sorting of parcels.
- Adopt active light infrared binocular camera with high stability and resistance to ambient light interference.
- Highly accurate parcel contour recognition algorithm to locate ultra-thin letters down to 1mm.
- Using self-developed deep learning algorithm to support the separation of sticky state parcels and their rotation posing.

### Product Specification



Large Parcel Singulation System

| | |
|---|---|
| Sorting Efficiency | 6000 pcs/h |
| Sorting Accuracy | 99 % |
| Goods Size Range | 150 mm ×150 mm × 15 mm ~<br>1200 mm ×1000 mm × 700 mm |
| Maximum Goods Weight | 70 kg |
| Conveying Speed | Three Speed Mode (Speed Configurable) |

Small Parcel Singulation System

| | |
|---|---|
| Sorting Efficiency | 10000 pcs/h |
| Sorting Accuracy | 99 % |
| Goods Size Range | 120 mm ×120 mm ×1 mm~<br>465 mm ×380 mm ×250 mm |
| Maximum Goods Weight | 8 kg |
| Conveying Speed | Three Speed Mode (Speed Configurable) |