

PICKING AGV



Multi-Layer Box Picking Robots Product Brochure



2017 Picking AGV “Global Pioneering”

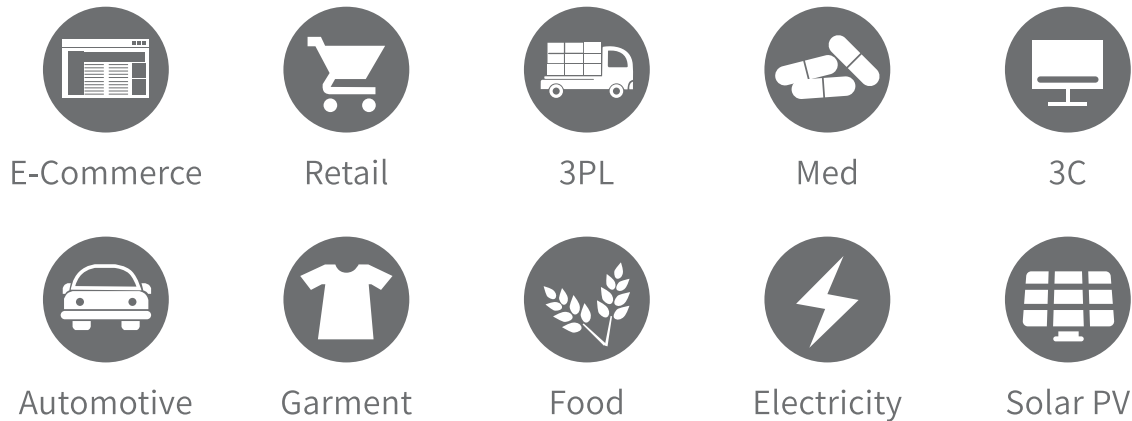
1500+ Intellectual Property Rights (including amounts of PCT international patents)

1500+ Users

30+ Countries and regions

As a worldwide pioneer in box picking robots, Guozi Robotics takes Picking AGV as the core to form intelligent, flexible, high-return solutions in customized industrial automation warehousing. Company has accumulated rich experience in different industries, delivering intelligent logistics solutions that exceed the expectations of customers worldwide.

Application Industry



 **Implementation period**
7 days~3 months

 **Warehousing capacity**
40%~140% up

 **Payback period**
1.5~2 years in average

 **Working efficiency**
100%~400% higher than worker





GZ Picking System

Efficient Goods-to-Person Picking Solutions

GZ Picking System is a proven intelligent goods-to-person robot system with high efficiency and high storage density. It's mainly composed of software and hardware like PICKING, SKY-PORT, conveyors, racks, boxes and the GZ-WMS. It could satisfy diversified needs of customers such as mixed picking of boxes in different sizes and materials, and is widely applied for "split and pick" in various industries like e-commerce, retail, garment, Solar PV, 3PL and so on.

High Efficiency

Fast go-live

Regular projects can be implemented and put into operation within 2-4 weeks.

No need to change boxes

Original boxes are reused, saving labor and costs for box changes and improving the efficiency of warehousing.

High picking efficiency

Picking efficiency per workstation can reach 200-400 orders/hour, improving efficiency by 2-4 times.

High storage capacity

High space utilization

The picking height range is 0.35m-10m, which is 3-4 times higher than conventional shelving. Supports double-deep shelf deployment, reducing the aisle area by about 50%.

Multi-size compatible

The hook-in unit can adjust the width according to the size of the boxes, with smaller spacing between boxes, significantly increasing the storage density.

Intelligent

Product Analysis

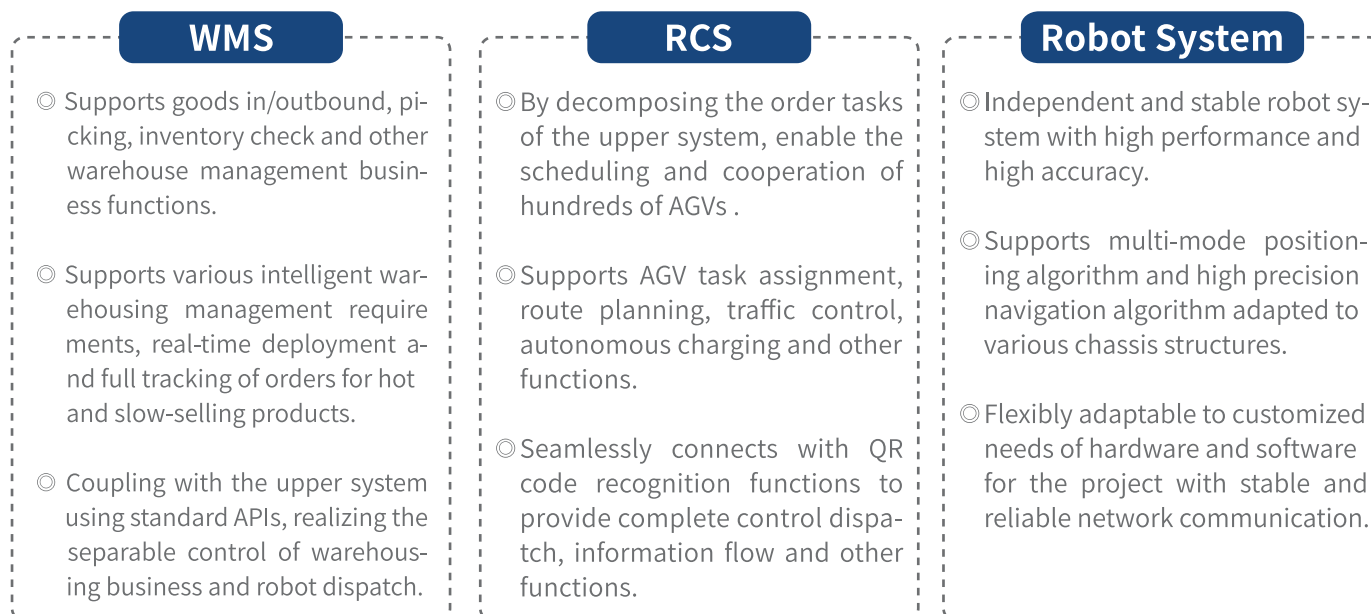
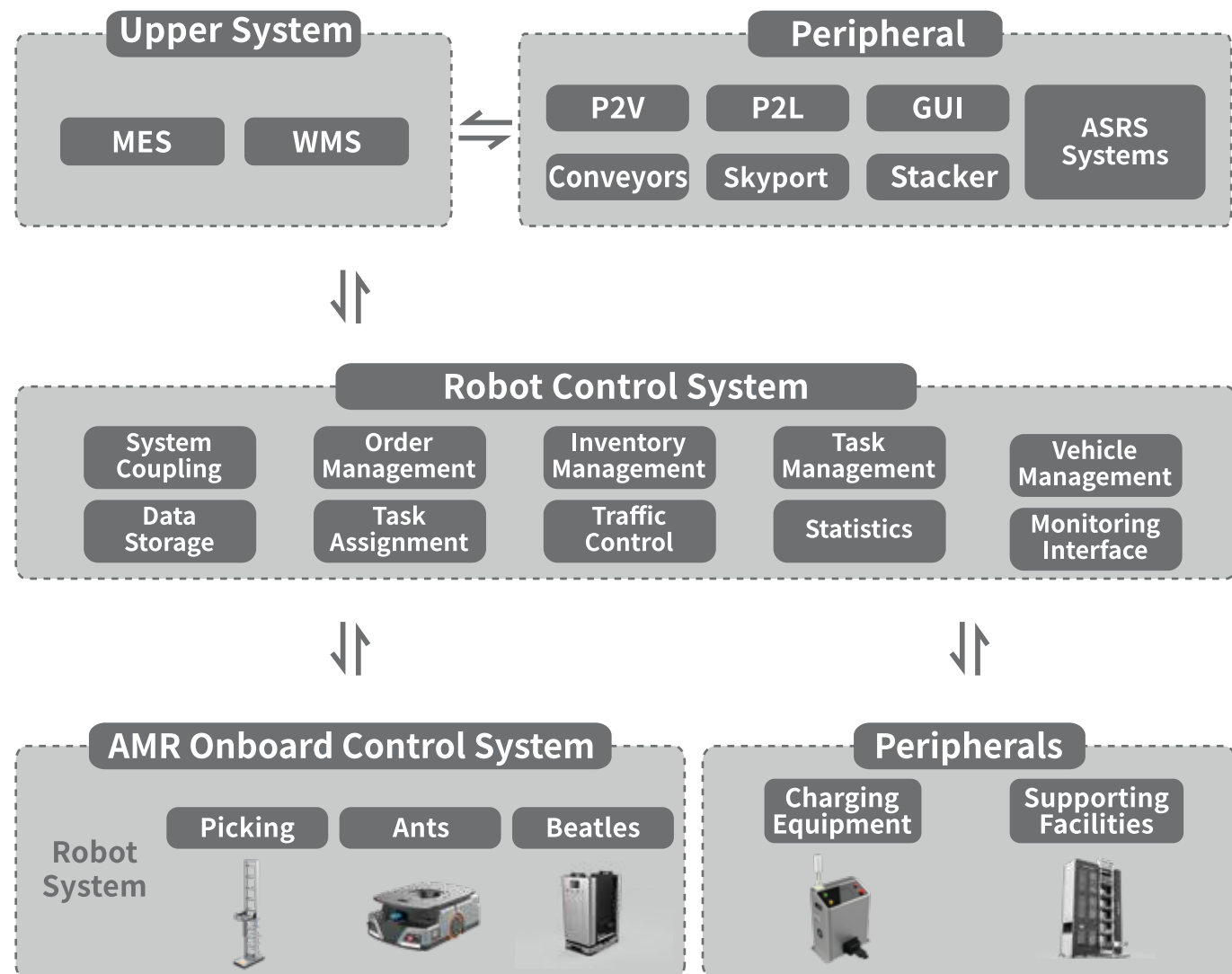
Based on intelligent outbound prediction. Boxes with different popularity levels are reasonably distributed in the warehouse, making robot routes optimized and not congested, which maximizes the handling efficiency.

Task Equalization

Based on intelligent task equalization algorithm, the tasks are reasonably distributed according to the completion time of each robot, shortening the completion time of tasks and maximizing the throughput.

Automatic stocking

Based on sales forecasts and real-time orders, robots are used for automatic stocking when they are idle, allowing the inventory distribution to be adjusted in advance to match the picking demand, maximizing the utilization rate of robots.



PICKING P4(CE)

Multi-Layer Box Picking Robot Standard Hook-in Unit

Widely used in warehouses and industrial workshops of various industries to realize accurate and flexible in/outbound, inventory, picking, line-side distribution and other operations, improve picking and storage efficiency and enhance warehouse capacity.



Flexible

- Flexible customization of car height and storage spaces (2000-5550mm).
- Easily adaptable with various equipment such as shelves, conveyor lines, picking tables, racks, seeding walls and so on.
- Customizable picking unit, compatible with cargo boxes and cartons of different sizes and materials.



Efficient

- Work with GZ-SKY-PORT crate loader to load/unload 8 crates at the same time.



Safe

- Equipped with front and rear safety lasers, emergency stop button, sound and light alarm, storage position detection, anticollision and other safety protections.
- TÜV Rheinland authoritative CE certification in accordance with EN ISO 3691-4:2020, EN ISO 12100:2010, EN 1175-1:1998+A1:2020.

Application Scenarios

E-commerce, logistics warehousing

Accomplish tasks like in/outbound of the warehouse, picking, inventory, warehouse management. Combined with our GZ-RCS, we are able to satisfy the needs for intelligent scheduling, fast picking, high precision and high capacity.

Auto parts warehousing

Meet the demand of multi-box warehousing, realize fast and accurate in/out operations of material boxes, which can improve the storage capacity and efficiency.

Manufacturing

Connect the storage area with the production line, distribute multiple boxes to the lineside warehouse, conveyor lines and other equipment, realize the automation of material logistics in the whole factory.



PICKING P4-D

Multi-Layer Box Picking Robot Double Depth Hook-in Unit

The farthest pickup distance reaches 1.6m, significantly increase the storage capacity with more shelves and less aisles.



Flexible

- Flexible customization of car height and storage spaces (2000-5550mm).
- Easily adaptable with various equipment such as shelves, conveyor lines, picking tables, racks, seeding walls and so on.
- Customizable picking unit, compatible with cargo boxes and cartons of different sizes and materials.



Efficient

- Work with GZ-SKY-PORT crate loader to load/unload 8 crates at the same time.



Safe

- Equipped with front and rear safety lasers, emergency stop button, sound and light alarm, storage position detection, anti-collision and other safety protections.

Application Scenarios

E-commerce, logistics warehousing

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Auto parts warehousing

Meet the demand of multi-box warehousing, realize fast and accurate in/out operations of material boxes, which can improve the storage capacity and efficiency.



PICKING P4-F

Multi-Layer Box Picking Robot Standard Lift & Hold Unit

Innovative lifting fork design allows the handling, distribution and storage operations of standard boxes, irregular materials, and irregular workpieces in industrial scenarios, which helps the logistics and distribution process before in-plant production lines and warehouses.



Flexible

- Flexible customization of car height and storage spaces(2000-5550mm).
- Customizable lift&hold unit, compatible with special shaped work pieces.
- Easily adaptable with various equipment such as shelves, conveyor lines, picking tables, racks, seeding walls and so on.



Safe

- Equipped with front and rear safety lasers, emergency stop button, sound and light alarm, storage position detection, anti-collision and other safety protections.

Application Scenarios

Instrumentation, electronics

Goods come in different shapes. The transportation of various materials such as meters, tray, electrostatic frames, etc. can be easily realized with our AGV by directly handling the equipment or adding the bottom bracket.

Photovoltaic industry

Picking and handling of silicon material box. Realize automatic material allocation, shelving, preparation and caching.

Manufacturing industry

By customizing the lift & hold units, achieve the transporting, shelving tasks of special tooling, shaped parts, tires and other irregular goods.



PICKING P4-X

Multi-Layer Box Picking Robot Adaptive Hook-in Unit

Innovative contour recognition technology could dynamically adjust the width of picking unit, realizing the operations of picking, handling and distributing multi-size boxes, improving storage capacity and picking efficiency.



Flexible

- Flexible customization of car height and storage spaces (2000-5550mm).
- Customizable fork teeth, compatible with special shaped work pieces .
- Easily adaptable with various equipment such as shelves, conveyor lines, picking tables, racks, seeding walls and so on.



Safe

- Equipped with front and rear safety lasers, emergency stop button, sound and light alarm, storage position detection, anti-collision and other safety protections.

Application Scenarios

Supermarkets and department stores

Adaptive picking unit can adapt to the needs of supermarket containers with multiple sizes and high storage capacity, realizing high efficiency, high storage capacity and high precision picking in warehousing.

Auto parts warehousing

Meet the demand of multi-box warehousing, realize fast and accurate in/out operations of material boxes, which can improve the storage capacity and efficiency.

E-commerce, logistics warehousing

Accomplish tasks like in/outbound of the warehouse, picking, inventory, warehouse management. Combined with our GZ-RCS, we are able to satisfy the needs for intelligent scheduling, fast picking, high precision and high capacity.



PICKING P4L

Multi-Layer Box Picking Robot Dual-Gantry Hook & Loop Unit

Extendable gantry with 0.4m-10m ultra-high coverage, greatly improving the utilization of vertical space to meet the demand for higher capacity and ensure the safety of robot operation.



Flexible

- Easily adaptable with various equipment such as shelves, conveyor lines, picking tables, racks, seeding walls and so on.



Efficient

- Adaptive with GZ-SKYPOR, load/unload 8 boxes at the same time.



Safe

- Equipped with front and rear safety lasers, emergency stop button, sound and light alarm, storage position detection, anti-collision and other safety protections.

Application Scenarios

E-commerce, logistics warehousing

Accomplish tasks like in/outbound of the warehouse, picking, inventory, warehouse management. Combined with our GZ-RCS, we are able to satisfy the needs for intelligent scheduling, fast picking, high precision and high capacity.

Footwear Industry

It can satisfy the application requirements of high storage capacity, high flow rate, and high-frequency split picking.



SKY-PORT

Intelligent Box Loading/Unloading Machine Standard Hook-in Unit

Work with GZ-Box Picking P Series Robots to load/unload 8 crates at the same time.
Can be connected to the conveyor line and manual workbench, the maximum efficiency of box output is 40s/8 boxes, 3-4 times more efficient than conventional single-layer conveying line.

- Docking layers:** 8 layers
- Suitable box size:** 600×400×(120-400) mm (standard) \ (300-650)×(200-430)×(120-400)mm (can be customized)
- Maximum load of single box:** 30kg
- Maximum loading and unloading efficiency:** 720 boxes/h
- Docking height of outlet:** 1110mm
- Authoritative certification:** NRTL
- Single pick and place time:** 3s

- Small space requirement, customizable height.
- Flexible switching of in/outbound modes to cope with in/out-bound peaks.

Application Scenarios

E-commerce, logistics, supermarket warehousing

Able to meet the needs of high-efficiency picking, in/outbound of the warehouse. Together with GZ P-series Box Picking robots and A series of latent jacking robots, we can bring intelligent and efficient one-stop solutions.



Smart Logistics Solution for a E-commerce warehouse in office supplies industry

Project location: United States

As one of the world's largest office supply retailers today, Staples has established a strategic cooperation agreement with GZ-Robots since 2017. With a cumulative deployment of more than 2,000 sets of Box Picking robots, GZ has built a stable and reliable intelligent logistics system for a number of large-scale warehouses in North America. The project is located in New York, with a warehouse area of more than 12,000 square meters, 40,000 storage spaces, over 15,000 active SKUs in the warehouse, and an average daily volume of 20,000 orders.

Challenges

- ◎ Large warehouse area, high picking workload, low picking efficiency.
- ◎ Various kinds of SKU, picking accuracy needs to be improved.
- ◎ High personnel management costs, low inventory management efficiency.

Solutions

- ◎ Dynamically adjust the layout of the warehouse according to business situation, achieve the dynamic distribution of popular and unpopular products, shorten the picking distance, improve the efficiency of picking, and realize the optimization of SKU distribution and inventory to improve efficiency.
- ◎ Innovatively combine AGVs and robotic arms to realize completely unmanned picking at the station, which further improves picking efficiency at the picking station.
- ◎ Set up the packing area on the second floor and connects the two areas on the first and second floors through a conveyor line, further improving operational efficiency and warehouse space utilization.
- ◎ Innovative fire avoidance mode, after triggering the fire alarm, the robot will automatically travel to the designated location, allowing the site to fully ensure the safety of people, vehicles and goods in case of emergency.

Benefits

- ◎ GZ Robotics completed the delivery of nearly 300 units of Picking in just 3 months, and was the first third-party equipment supplier to complete the delivery task on-site. During Black Friday, the first year-round promotional peak in North America after the completion of the project, Staples' New York warehouse completed a record-breaking daily average of 70,000 order lines in and out of the warehouse, and the overall picking efficiency was more than 50% higher than that of traditional manual picking, while picking accuracy, inventory accuracy and other operational indicators were also significantly improved.



Smart Logistics Solution for a E-commerce warehouse in home furnishing industry

Project location: Canada

A century-old home furnishings brand from Europe has experienced rapid growth in its online business. In Canada, the total area of the brand's warehouse has exceeded 10,000 square meters. The warehouse manages thousands of home products and provides delivery services for millions of customers in North America. The company utilizes robotic solutions from Guozi Robotics to achieve intelligent handling of home goods. The combination of the ANTS-10 and PICKING operating in the same workspace facilitates SKU picking and transportation, bringing a 40% improvement in warehousing and picking efficiency, and 50% in warehouse volume.

Challenges

- Too much manual work required during the peak period.
- Household products vary greatly in sizes and weights.
- Part of the goods are placed directly on the ground, wasting storage space.

Benefits

- Guozi assists customer in upgrading their warehouse systems, integrating with customer's WMS and security systems. The intelligent RCS Dispatch of Guozi can uniformly schedule, manage, and arrange tasks for multiple types of robots, optimizing path planning and operational efficiency. The collaboration of multiple robots will adapt to a wider range of application scenarios, meeting diverse logistics needs of customers, and contributing to the overall efficient operation of the warehouse.



Solution

- Ants-10 is used to transport large household products from the picking area to shelves.
- PICKING Plus picks up small and medium-sized household products.
- Various types of robots are dispatched together to accurately pick and place each SKU.
- Multiple types of shelves are used to meet the need of transporting different types of SKUs.
- The collaboration of two types of AGVs can significantly expand vertical space and increase the storage capacity.



Smart Logistics Solution for a intelligent warehouse in Pharmaceutical Industry

Project location: China

A Chinese medical enterprise expanded its B2B online trading platform for medical consumables in 2019. The warehouse, over 6,000 sqm, manages thousands of medical devices, offering complete supply chain services to 30,000+ medical institutions nationwide. For smaller cargo is "goods to person" picking applied, for larger cargo is "person to goods," forming an order relay for efficient SKU transportation. Manual and automated processes reduce complexity, aiding the transformation of traditional medical warehousing.

Challenges

- The racks are designed for workers to reach. Short racks and wide aisles lead to low space utilization rate of the warehouse.
- Massive increase in SKUs and orders requests much more human labor, bringing too much labor cost of the enterprise.
- Manual picking is time-consuming and laborious for large warehouse area. Low picking efficiency makes it hard to respond customer orders in time.
- Medical consumables have many SKUs and strict batch release requirements, manual picking leads to a high error rate and product breakage rate.

Benefits

- The solution takes PICKING as the core, bringing 30% increase in transportation and picking efficiency. Adapting high shelves effectively enlarges the warehouse volume by 30-40%. High picking correct rate ensures the accuracy, efficiency and continuous output. Single AGV can operate for 8 hours, achieving 24-hour continuous operation of the warehouse, and improving the overall efficiency of the whole warehouse by more than 50%.



Solution

- Phased implementation: Does not affect the normal operation of warehouse. In phase one is the current business needs satisfied, and in phase two will the business needs of the next three years be satisfied, achieving long-term economic gains, saving millions of labor costs every year.
- Separate storage for the goods with high outbound quantity. Combine robots and DPS electronic label picking system to achieve high-speed and accurate inbound and outbound operations, increasing the inbound efficiency by 60% and the outbound efficiency by 120%, reducing picking error rate to 3/10000 and increasing picking accuracy by 60 times.
- For different combinations of orders, different methods of picking are adopted, such as whole box lifting, orders combining, workstation seeding, and workstation designating, optimizing the order structure and realizing the intelligence of the picking and transportation process in medical warehouses.





		P4	P4 (CE)	P4-D	P4-F	P4-X	P4-L
Basic Parameters	Size(mm)	1736×880×5275	1736×880×5275	1736×880×5275	1720×880×5275	1739×880×5275	1843×1000×4870
	Rotation Diameter (mm)	1825	1825	1825	1825	1825	1990
	Navigation	QR Code	QR Code	QR Code	QR Code	QR Code	QR Code
Load/unload	Max Payload per Unit(kg)	30	30	30	50	30	30
	Total Max Payload (kg)	300	300	300	300	300	300
	Min/Max Picking Height(mm)	350/4945	350/4945	350/4945	430/4915	350/4945	400/8000
	Storage	8 Layers	8 Layers	8 Layers	7 Layers	8 Layers	8 Layers
	Box Size(mm)	L:300~610/W:360~400 H:100~400	L:300~610/W:360~400 H:100~400	L:300~610/W:360~400 H:100~400	L:300~700/W:360~550 H:100~400	L:300~610/W:200~400 H:100~400	L:300~610/W:360~400 H:100~400
	Box Type	Plastic Box, Paper Box	Plastic Box, Paper Box	Plastic Box, Paper Box	Plastic Box, Paper Box, Shaped Materials	Plastic Box, Paper Box	Plastic Box, Paper Box
Movement	Drive Type	Two-wheel Differential : Forward, Reverse, Turn, Rotate in place	Two-wheel Differential : Forward, Reverse, Turn, Rotate in place	Two-wheel Differential : Forward, Reverse, Turn, Rotate in place	Two-wheel Differential : Forward, Reverse, Turn, Rotate in place	Two-wheel Differential : Forward, Reverse, Turn, Rotate in place	Two-wheel Differential : Forward, Reverse, Turn, Rotate in place
	Speed(m/s)	0.05-1.2	0.05-1.2	0.05-1.2	0.05-1.2	0.05-1.2	0.05-1.2
	Positioning Accuracy	±10mm/0.5°	±10mm/0.5°	±10mm/0.5°	±10mm/0.5°	±10mm/0.5°	±10mm/0.5°
Battery	Battery	Li-FePO4 48V 28.8Ah	Li-FePO4 48V 28.8Ah	Li-FePO4 48V 28.8Ah	Li-FePO4 48V 28.8Ah	Li-FePO4 48V 28.8Ah	Li-FePO4 48V 28.8Ah
	Battery Life	≥8h	≥8h	≥8h	≥8h	≥8h	≥8h
Comm	Network	5.8GHz WiFi (802.11 a/n) 5G (when needed)	5.8GHz WiFi (802.11 a/n) 5G (when needed)	5.8GHz WiFi (802.11 a/n) 5G (when needed)	5.8GHz WiFi (802.11 a/n) 5G (when needed)	5.8GHz WiFi (802.11 a/n) 5G (when needed)	5.8GHz WiFi (802.11 a/n) 5G (when needed)
Safety/IO	Safety	Safety PLC / Safety Laser / E-Stop / Sound&Light Alarm	Safety PLC / Safety Laser / E-Stop / Sound&Light Alarm / Up&Down Speed Check	Safety Laser / E-Stop / Sound&Light Alarm	Safety Laser / E-Stop / Sound&Light Alarm	Safety Laser / E-Stop / Sound&Light Alarm	Safety Laser / E-Stop / Sound&Light Alarm / Collision Detaction
	Buttons / IO	Manual&Auto Switch / Error Clear / Manual Charging / Ethernet / Power Switch	Manual&Auto Switch / Brake Loose / Error Clear / Manual Charging / Ethernet / Power Switch / Safety Laser ON&OFF / Manual Control Interface	Error Clear / Manual Charging / Ethernet Interface / Power Switch	Error Clear / Manual Charging / Ethernet Interface / Power Switch	Error Clear / Manual Charging / Ethernet Interface / Power Switch	Error Clear / Manual Charging / Ethernet Interface / Power Switch
Environm-ent	Environment	Indoors / Temp 0~40℃ / Humidity 20~80%	Indoors / Temp 0~40℃ / Humidity 20~80%	Indoors / Temp 0~40℃ / Humidity 20~80%	Indoors / Temp 0~40℃ / Humidity 20~80%	Indoors / Temp 0~40℃ / Humidity 20~80%	Indoors / Temp 0~40℃ / Humidity 20~80%



SKY-PORT		
Basic Parameters	Size(mm)	2750×1505×4776
	Ground Bearing Requirements	>500kg/m^2
	Output Height(mm)	1110
Docking	Docking Type	AGV Rear Docking
	Docking Layer	8 Layers
	Load/unload Type	Hook and Pull
	Box Size(mm)	600×400× (120-400) (standard) (300-650)×(200-430)×(120-400) (customize)
	Max Payload per Box (kg)	30
Load / Unload	Max Load/unload Efficiency	720 boxes/h
Electricity	Rated Power	7.8kw
	Input Voltage	380V/480V Three-Phase AC
Other	Environment	Indoors / Temp 0~40℃ / Humidity 20~80%
	Certifications	NRTL
	HMI	Touch Screen
	Safety	E-Stop



GZ Multi Picking system

Multi-Type Mixed Picking Solutions

GZ Multi Picking System achieves one-stop storage and picking of various goods in different sizes and materials using AGVs and the GZ-WMS.

Storage Spaces: Supports the storage of large and small goods in the same area, improving vertically space utilization of shelves, reducing overall storage area, maximizing storage density and compatibility.

Efficiency: The one-stop picking mode could increase the efficiency of in/outbound of the warehouse.

Compatibility: Works for high IO scenarios like B2C, B2B and also industrial production scenarios with oddly shaped items.

Intelligent Digitalization

MAPF

Compatible with whole-piece, whole-carton and split-picking of goods, satisfying diversified storage and picking needs.

Intelligent Algorithms

Using multiple intelligent picking algorithms to meet diverse needs and maximize robot utilization.

Data-driven decision-making

Automatic capturing and warning of the system anomalies to avoid potential production interruptions, using multi-dimensional data analysis and visualization to assist business decision-making and operation optimization.

Flexibility

Scalable

Easily adjust to surges and drops in demand by adding or redeploying robots maximizing efficiency.

Versatile

Meets the picking needs of diverse businesses - from B2c to B2B, Handles all types of goods - from small parts to heavy items.

Expandability

Seamless Scalability

Add storage and capacity in any direction as your business expands, effortlessly increasing library size.

Self-Learning AI

The system gets smarter the longer it runs, automatically optimizing picking strategies.

Streamlined Picking

Without complex order combinations, one-stop completion for diversified order picking process.

Compatibility

One Station Fits All

Compatible with whole-piece, whole-carton and split-picking of goods, satisfying diversified storage and picking needs.

Space Saver

Stack big items below and smaller ones on top, maximizing vertical space utilization.

Mixed Scheduling

Break the boundaries of equipment and system, realizing unified scheduling of different models on the same map.

Smart Logistics Solution for a intelligent warehouse in Retail Industry

Project location: Korea

As one of the five largest groups in Korea, retail is its core business. Massive orders flow in the warehousing and logistics center every day. Guozi Robotics has made full use of big data, AI, automation and advanced equipment to provide intelligent warehousing solutions for its warehouse and logistics center, realizing the optimal matching among people, goods, warehouses, and destinations, establishing a complete logistics chain, and rapidly improving its operational efficiency.

Challenges

- ◎ The robot needs to operate in a -20°C cryogenic environment.
- ◎ SKUs vary in size and quantity.
- ◎ Narrow aisles and busy operations.

Benefits

- ◎ After the implementation of our solution, products can be efficiently distributed from the logistics center to customer's 300 department stores, discount stores, supermarkets, and convenience stores, covering over 30 cities in South Korea, saving lots of manpower and giving an intelligent upgrade to its logistics system.

Solution

- ◎ Combining PICKING with conveyors, WCS, ECS, RCS etc., realizing automatic code labeling and accurate storage of goods in the warehouse.
- ◎ PICKING can still run stably in -20°C low-Temp environment, minimizing damage to AGVs and reducing manpower costs, which ensures the operation efficiency of the logistics center.
- ◎ PICKING is compatible with multi-size boxes, no need to replace original boxes.
- ◎ By scheduling AGVs, resource configuration and dynamic allocation, the Robot Control System (RCS) performs task assignment, scheduling collaboration and traffic control, achieving a single aisle multiple Picking coordinated operation.



Smart Logistics Solution for E-commerce warehouse in Garment Industry

Project location: USA

The project customer is one of the world's largest online sports apparel e-commerce companies. GZ-Robot has provided Smart Logistics Solution for its E-commerce warehouse, implementing more than 400 robots. It has successfully become customer's first fully-automated mega warehouse with more than 20,000 square meters and 400,000 storage spaces, lifting the picking efficiency by more than 50%.

Challenges

- ◎ Various SKU types, with constant changes in product inventory structure.
- ◎ peaks and valleys of the sales season, high requirement for in/outbound of warehouse.
- ◎ Shortage in labor, high labor cost.

Benefits

- ◎ The implementation of solution has achieved a fully automation in in/outbound, stocktaking and all sorts of exception handling in the warehouse managing process, which could flexibly solve the pressure of business changes, reduce HR management costs and warehousing costs, greatly improve the operation efficiency.

Solution

- ◎ Application of multi-layer robots and high-density racking, achieving high utilization of warehouse space in both flat and vertical dimensions.
- ◎ Flexible solution design to adapt to peaks and constant changes in product inventory structure.
- ◎ Applying the GZ-WMS and the GZ-RCS, resulting in more efficient warehouse operation.
- ◎ Multiple software interfaces, compatible with all sorts of management systems from the customer side, giving the customer a fully integrated software structure from supplying, warehousing to marketing, coping with SCM, WMS, ERP, MES, OMS etc.
- ◎ Quick implementation within only 6 months to bring the whole project online, providing solid backup for the customer's annual sales peak.

