



Printec with Libiao Robotics Sorting Solution





Printec is a leader in business-to-customer transaction technologies in Central and Eastern Europe, offering a wide range of technology solutions that help improve human interactions, making everyday life easier.

Through our solutions and services, we enable businesses to leverage innovative technology in order to provide superior customer experience and at the same time achieve operational efficiencies and regulatory compliance.



At a glance

16
Countries

35+
Years

500+
clients

3,000
SSMs

900+
Employees

23,000
ATMs

650,000
POSs

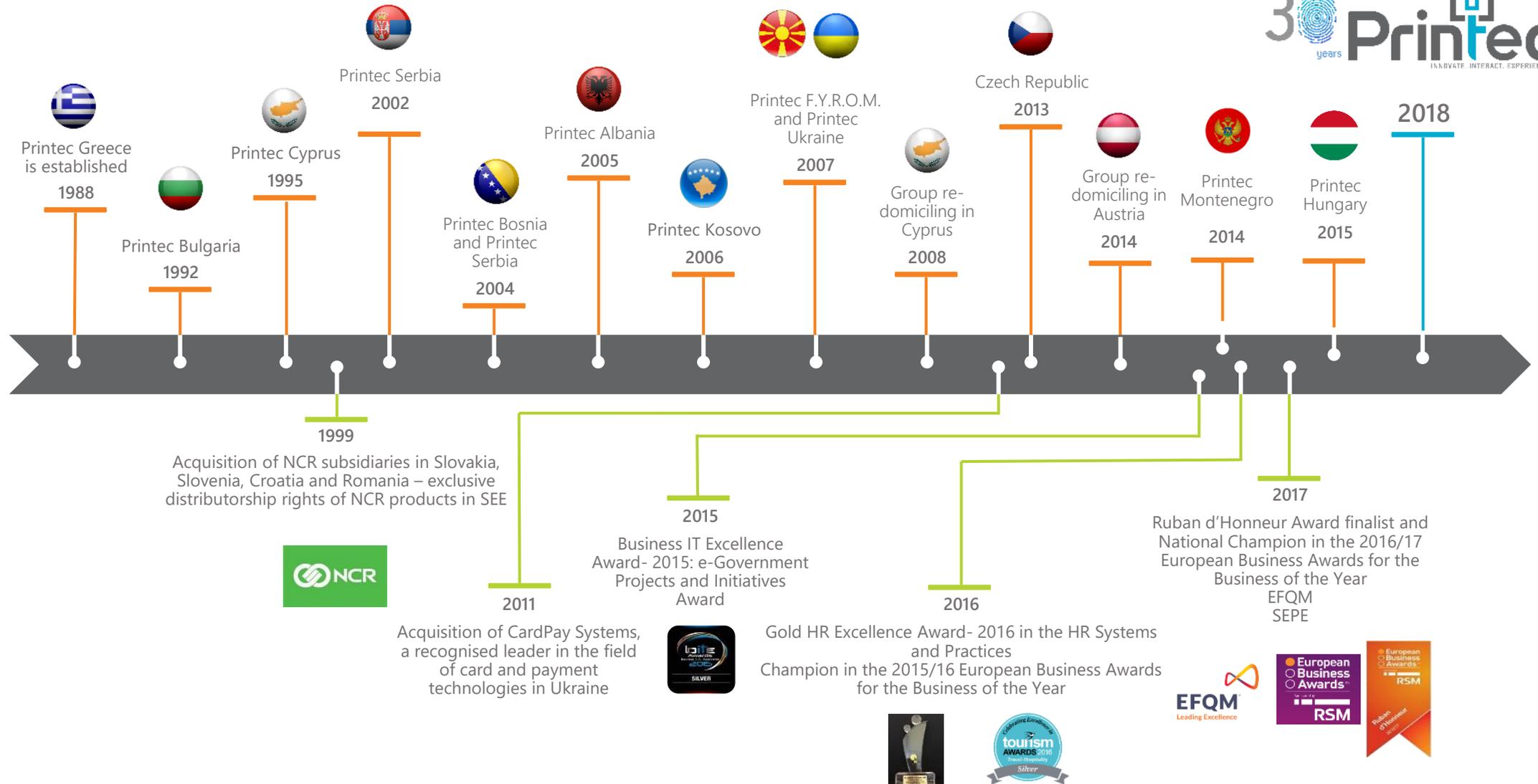

Printec
INNOVATE. INTERACT. EXPERIENCE.

35 years of experience



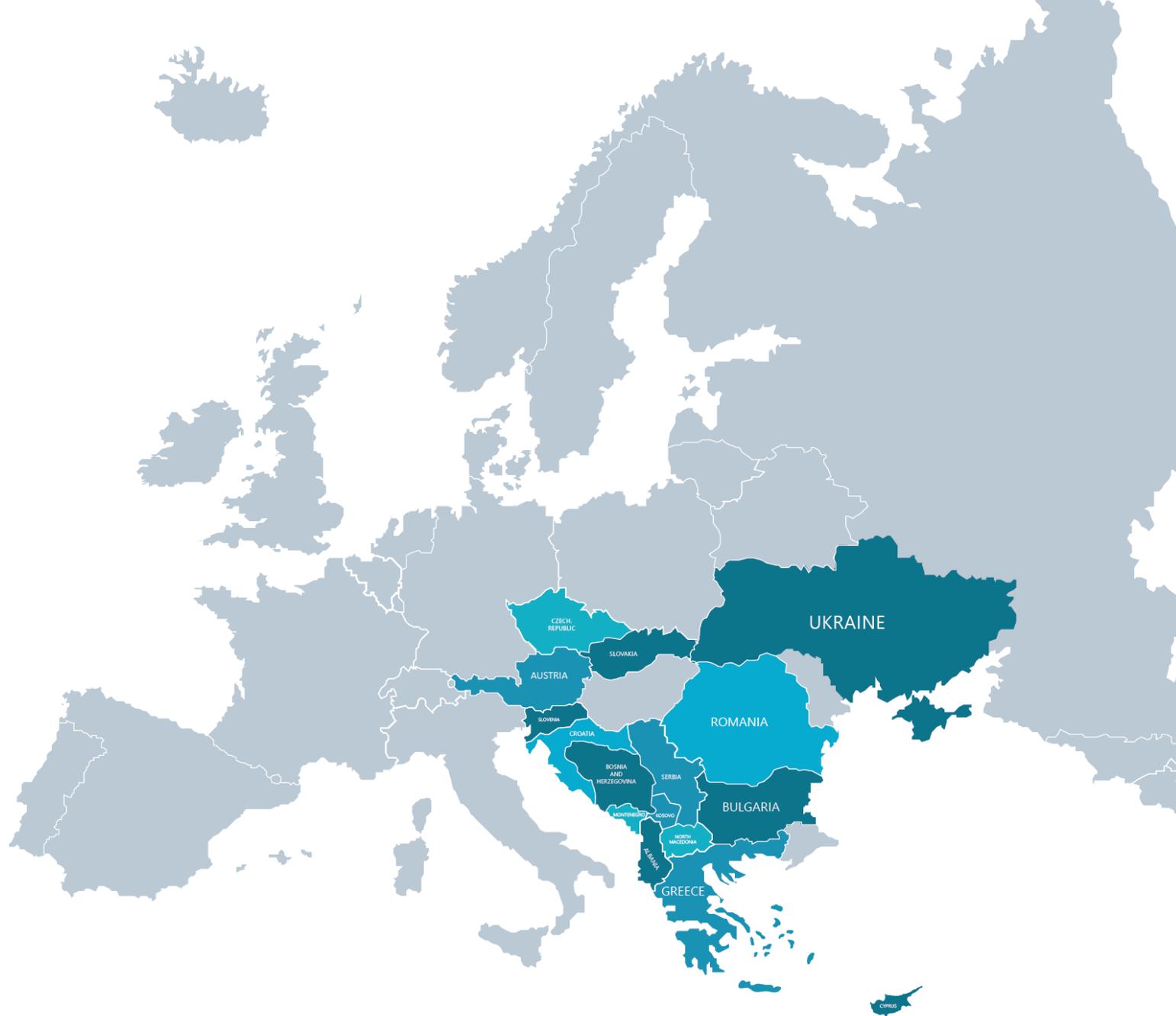
Geographic expansion

Acquisitions & awards

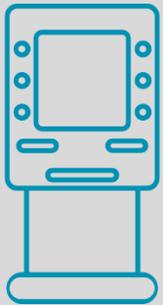


Location

- ALBANIA
- AUSTRIA
- BOSNIA AND HERZEGOVINA
- BULGARIA
- CROATIA
- CYPRUS
- CZECH REPUBLIC
- GREECE
- KOSOVO
- MONTENEGRO
- NORTH MACEDONIA
- ROMANIA
- SERBIA
- SLOVAKIA
- SLOVENIA
- UKRAINE



Key business solutions



Self-Service
Channels



Digital
Transformation



ePayments



Security &
Compliance



BI & Analytics



Sorting Solution Overview

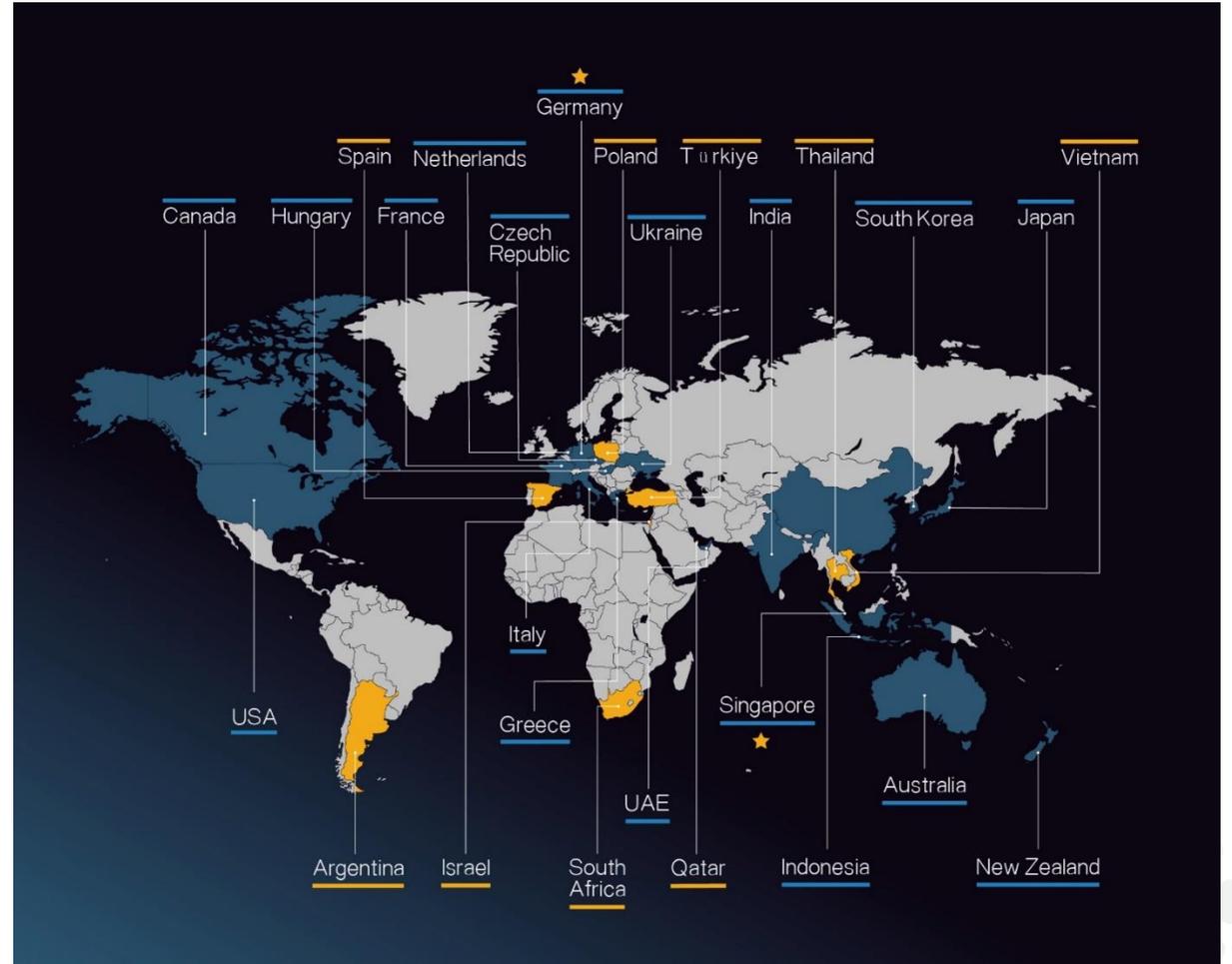


Original Inventor of Sorting Robot

30000

Robots Deployed Globally

- Working in 16+ industries**
Hundreds of projects deployed for various industries and scenarios
- Covering 6 continents**
Products being sold world widely with a global network
- 300+ projects in 30+ countries**
Widely recognized by different types of users



Libiao Robotics history



2016

- Libiao Robotics established
- Sorting robot officially launched
- First sorting system deployed

2018

- Entered the US markets, applied in wholesale and retail industry
- Developed New generation of navigation technology - **Magic Carpet Navigation**

2020

- Expanded globally, entered **Australia, the Middle East, Europe** and other markets.
- The cold storage sorting system succeeded, and was the first of its kind in the world

2022

- Libiao 3D sorting system launched
- Libiao Headquarters officially opened, became the global center of administration ,R&D and manufacture

2017

- The sorting robots became widely used in the **express courier industry**, worked for China Post, JD.com, STO Express, etc.



2019

- Entered the **Japan market** and more industries
- The **second generation of sorting robot** was launched, with new upgraded charging station



2021

- Made crucial progress in the **European and Southeast Asia market.**
- The globalization strategy promoted; global sales networks formed completely.





THE GLOBAL LEADING INNOVATOR IN SORTING ROBOT

- ✓ Original inventor of platform sorting robot
- ✓ Self-developed Navigation System
- ✓ Self-developed Robot Control System (RCS)
- ✓ Self-developed Communication System
- ✓ World widely patents and copyrights protected
- ✓ Authoritative awards and certifications receiver



Awards

Dozens of award including RBR 50, Top 10 Material Handling Provider in APAC, Material Handling Products of the Year.



Patents

100+ patents globally

Certification

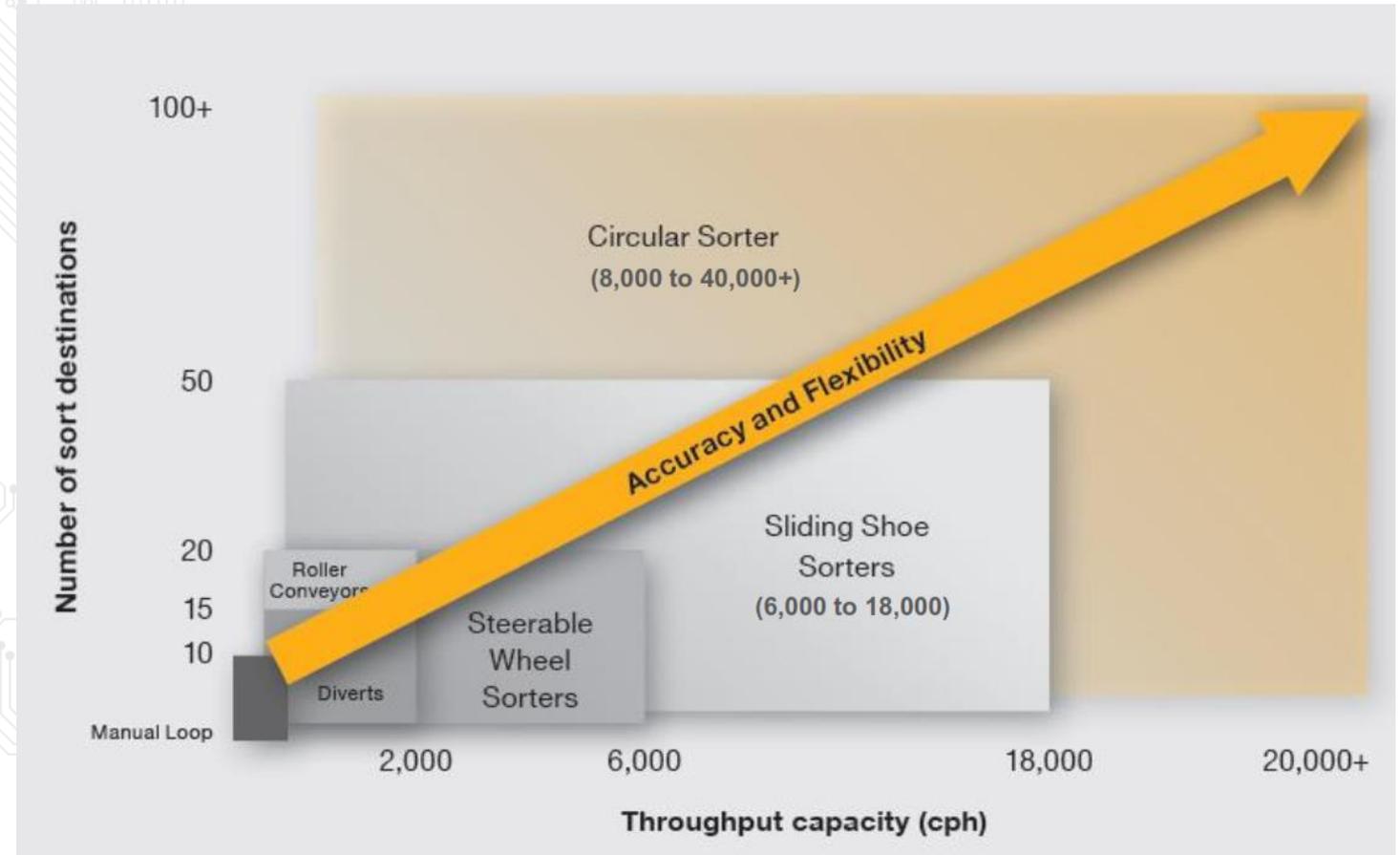
Comprehensive certifications
CE, UL, ISO9000, copyrights

Sortation systems Technologies



“The heart of the modern DC”

- ❑ **Conveyors Systems**
Pushers – deflectors, Pop-up or Swivel wheels etc.
- ❑ **Linear Systems**
Sliding Shoe systems.
- ❑ **Circulation Systems**
Cross-belt, Tilt tray, Split tray.
- ❑ **AMR Systems**
Floor & Table platforms.



AMR Sortation systems

(Autonomous Mobile Robots)



Floor sorting

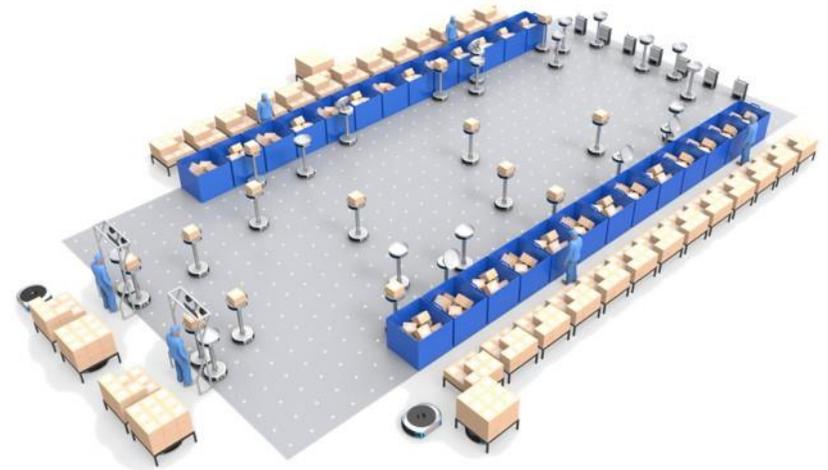


Table sorting (Libiao-Printec Solution)





T-sort sorting solutions

According to the parcel sorting and order picking requirements, supports flexible number of robots, chutes, layers to meet needs.

No concerns about site constraints, reducing costs and increasing efficiency.

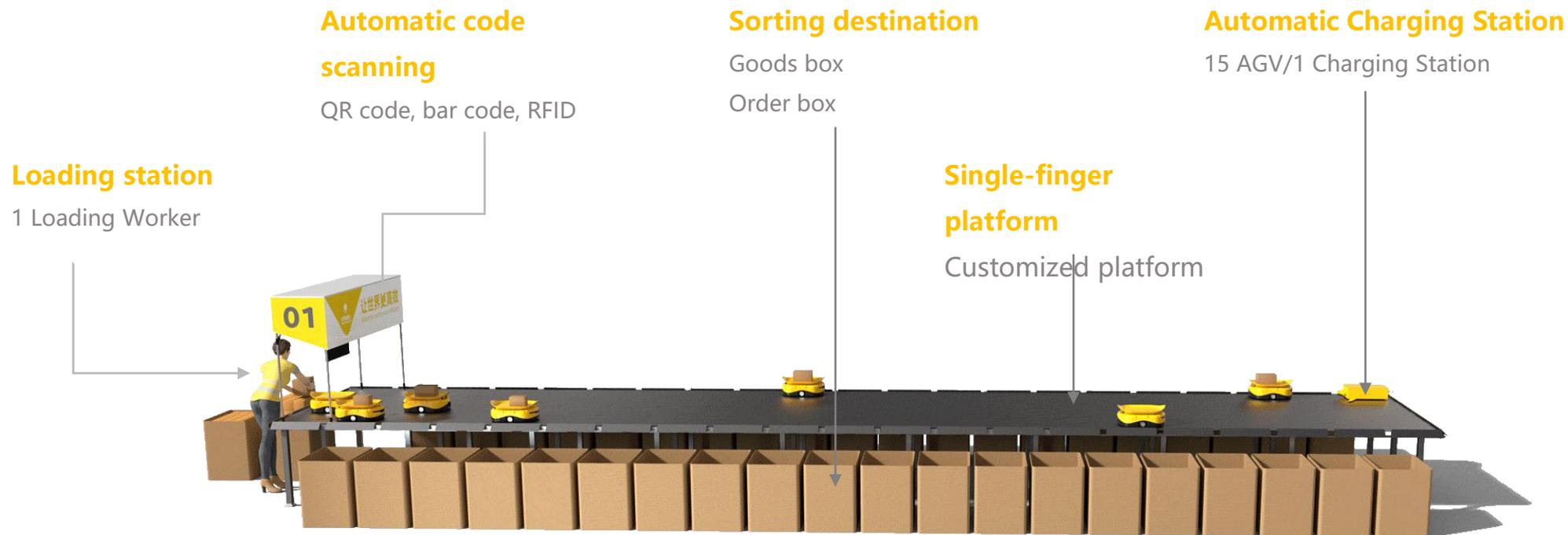


3D sorting solutions

Consists of table platform, 3D sorter, robot sorting system, and conveying system. Highly flexible and allows more destinations/chutes at the same space, able to cope with very high traffic sorting demands.

T-sort sorting solutions

Single Finger Type



- Single/multi-layers
- Longer/shorter
- Fingers addable



T-sort sorting solutions

LIBIAO
ROBOTICS

Single Finger Type
Single Layer And Double Layers



T-sort sorting solutions

Multiple Fingers Type - Single Layer



Loading station

- Manual load
- Automatic code scanning

Finger-type platform

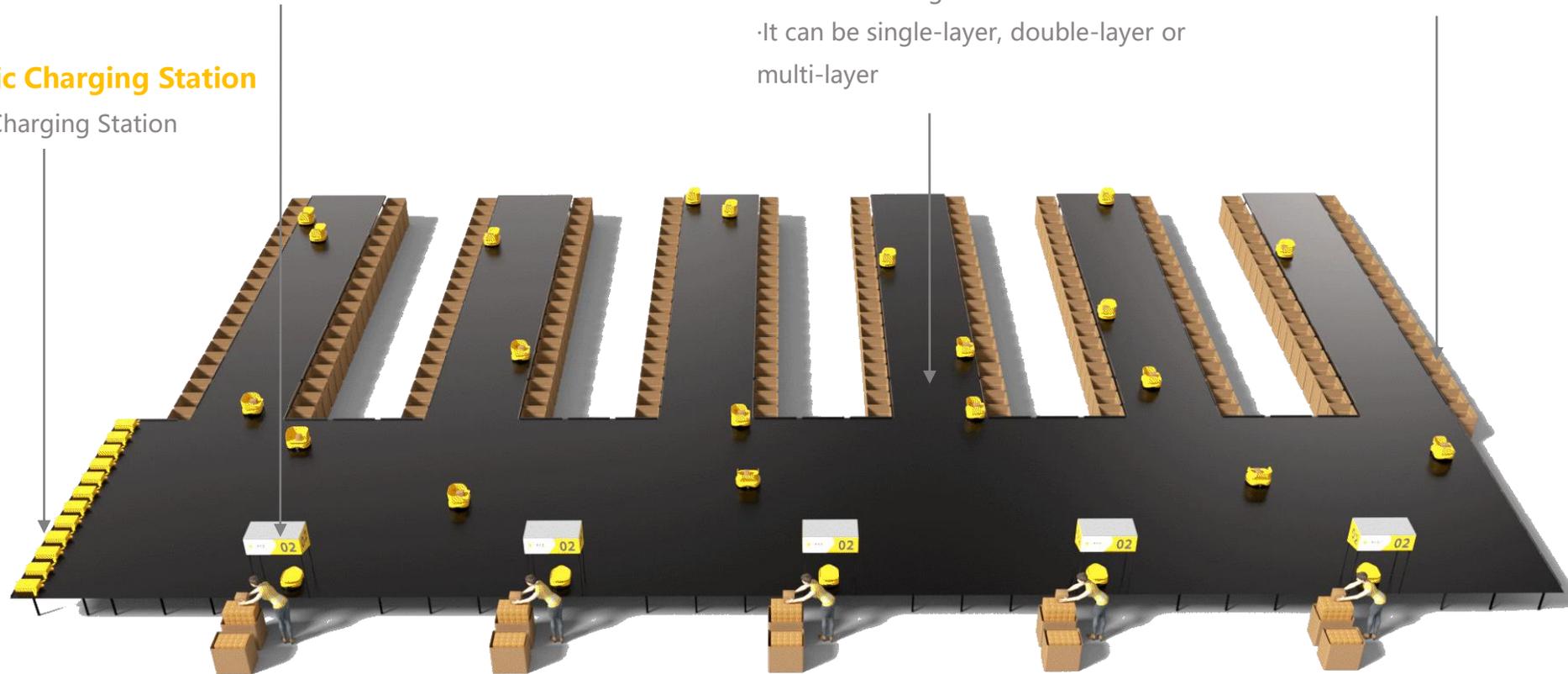
- The number and length of fingers can be set according to the demand
- It can be single-layer, double-layer or multi-layer

Sorting destination

- Goods box
- Order box

Automatic Charging Station

15 AGV/1 Charging Station



T-sort sorting solutions

Multiple Fingers Type - Double Layers



Loading station

- Manual load
- Automatic code scanning

Finger-type platform

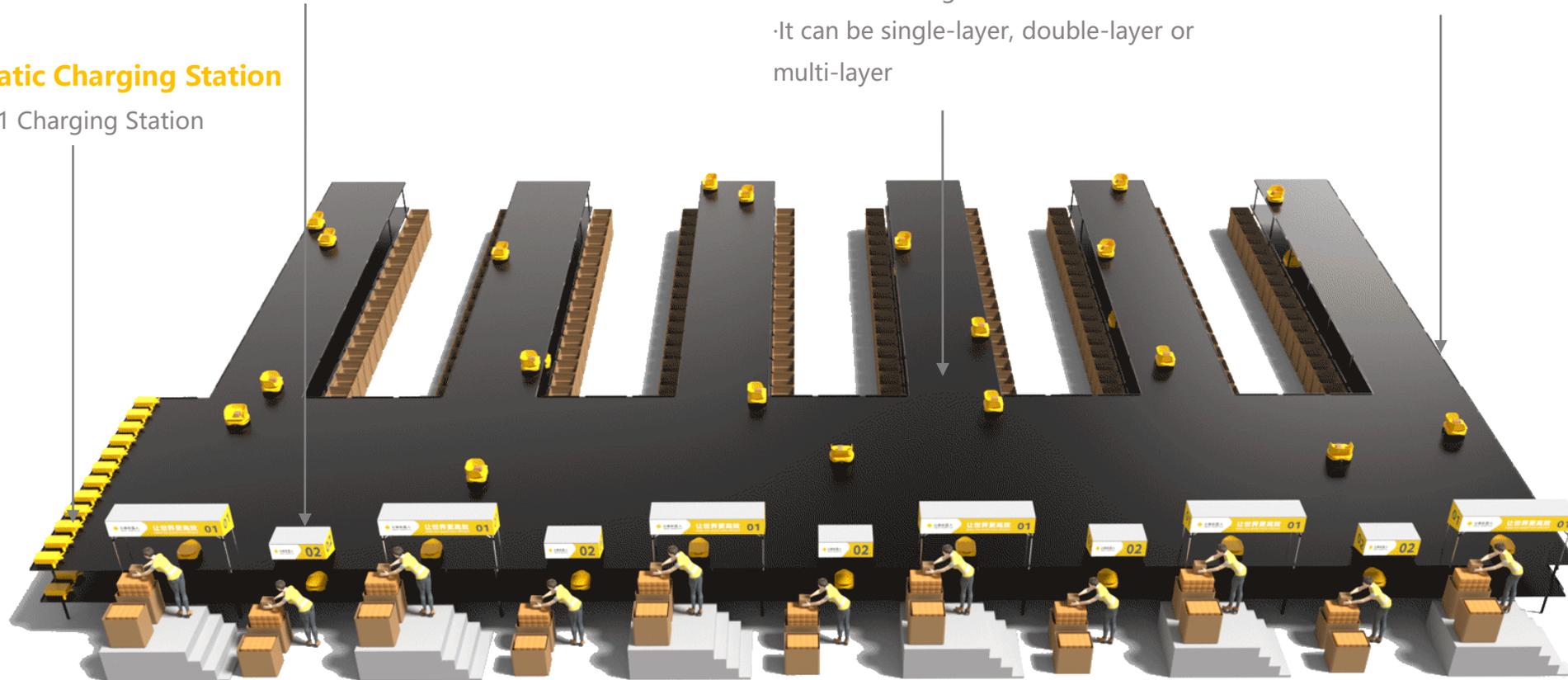
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Sorting destination

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15 AGV/1 Charging Station



LIBAO ROBOTICS 3D sorting solutions

3D Sorters Platform



Automatic Charging Station

15 AGV/1 Charging Station

Platform

Customized platform, can be multiple layers

Automatic code scanning

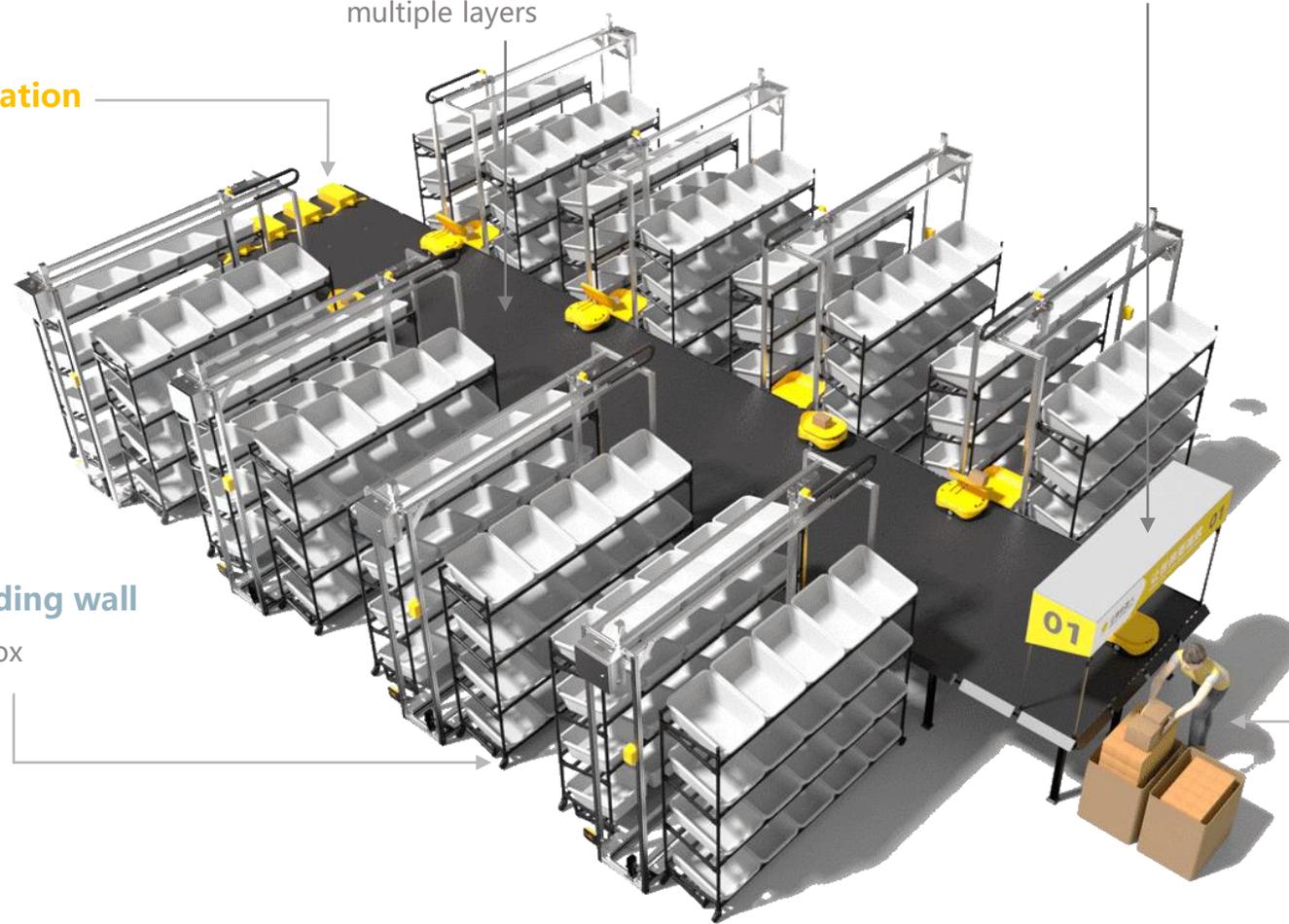
QR code, bar code, RFID

Loading station

1 Loading Worker

3D Seeding wall

Goods Box



Key Components

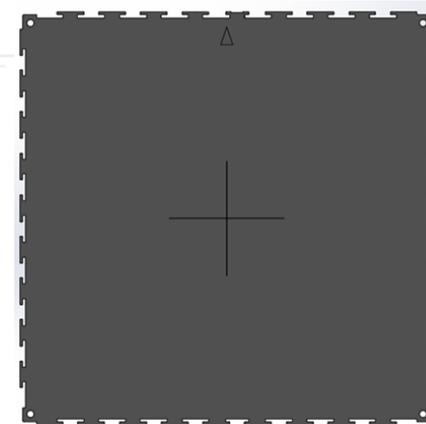
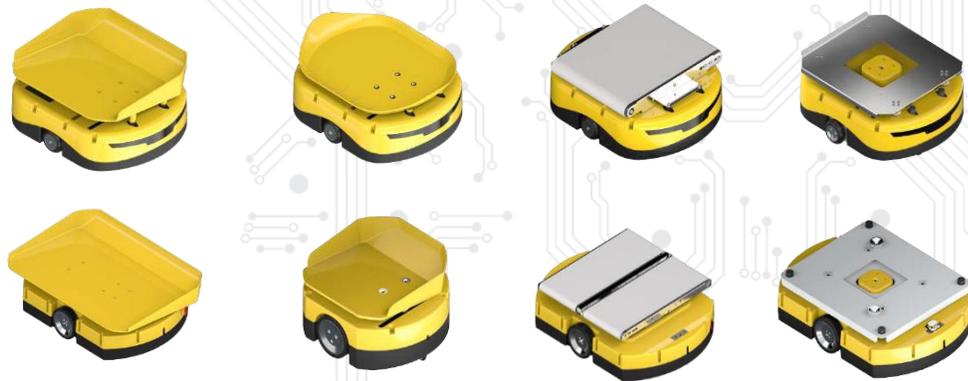


Robots

- Large range of robots that can handle a diversity of items in dimensions and volume

Magic Carpet

- PVC carpet that enables the robots to navigate around the table platform through RFID technology



Supporting Devices



Charging Station

Support continuous running of robot
Adapt to low temperature environment of cold storage



AP device

Original AP technology, stable network, wide coverage



Automatic scanning device

The system automatically scans parcel information
The robot transports the parcel to the destination independently



Automatic weighing device

After the goods are placed on the robot in a scanning area, weight information is automatically transmitted to the background



Full Bag/Box Detector

After detecting the full bags automatically, the robot takes away the full bags/goods boxes



Volumetric Camera

After the goods are placed on the robot in a scanning area, volume information is automatically transmitted to the background



- **Integrated and Intelligent System**

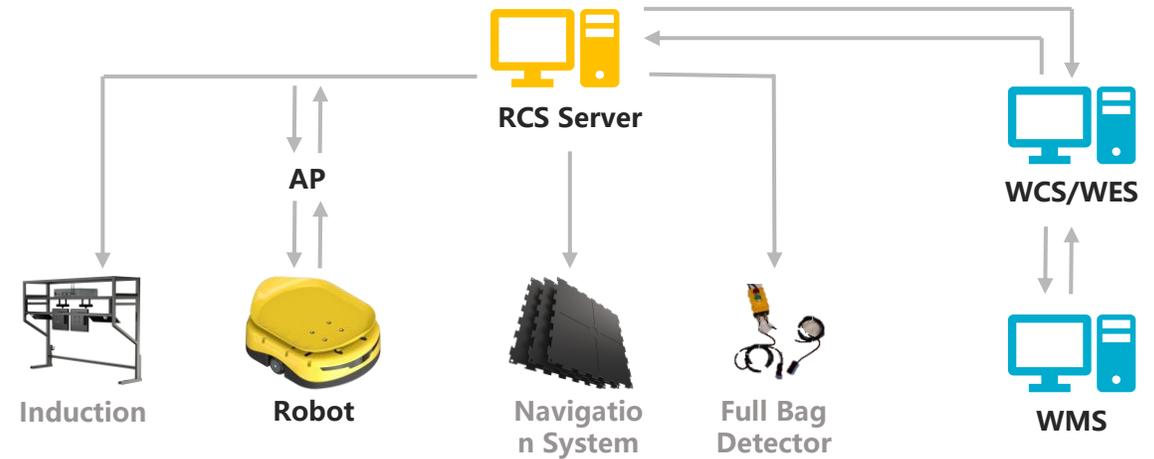
The system integrates a human-computer interaction (HCI) interface, path planning, robot communication, and all the real-time operation data management.

- **Efficient Dispatching of Robot Clusters**

The system simultaneously dispatches hundreds or thousands of sorting robots to work together, plans the optimal path for each robot.

- **Optimized Stability**

RCS provides extremely stable performance with optimal routes and high accuracy, significantly low error rates which has been examined by 300+ projects.



In-feed Methods



Manual Unit Handling Methods



Comparative advantage is the simultaneous execution of **multiple orders (batch picking)**, from all the in-feed stations.

Supported Automatic Unit Handling

A. Robotic Arm



B. Dispenser



Out-feed Methods



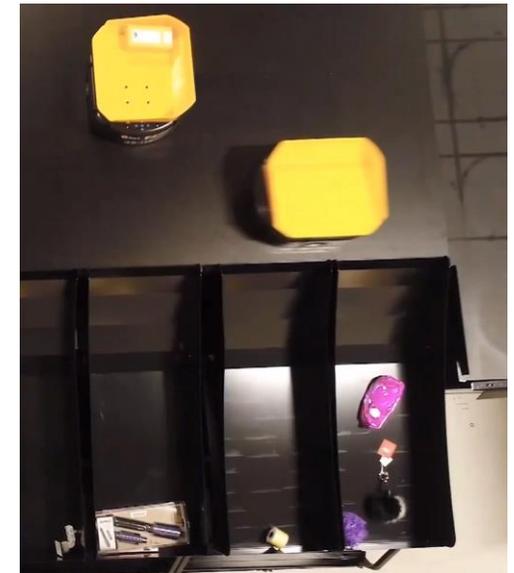
❑ Item can be sorted into:

- Bins
- Totes
- Packing bags
- Boxes / Cartons



❑ The products can be deposited at the chutes:

- By flipping the robot's board
- Through a slide ramp for transport of fragile products
- Via belt and roller lane



Robot Control System

😊 Run Mode: **Random Running** | Run Time: **00:10:46** | Throughput: **771** | Last Minute Throughput: **72** | Throughput Per Hour: **4291** | Throughput Per Minute: **72** | Stop Time: **00:00:00**

Stop

E-Stop

Server

Robots

Options

MagView

Diagnostic

Tools

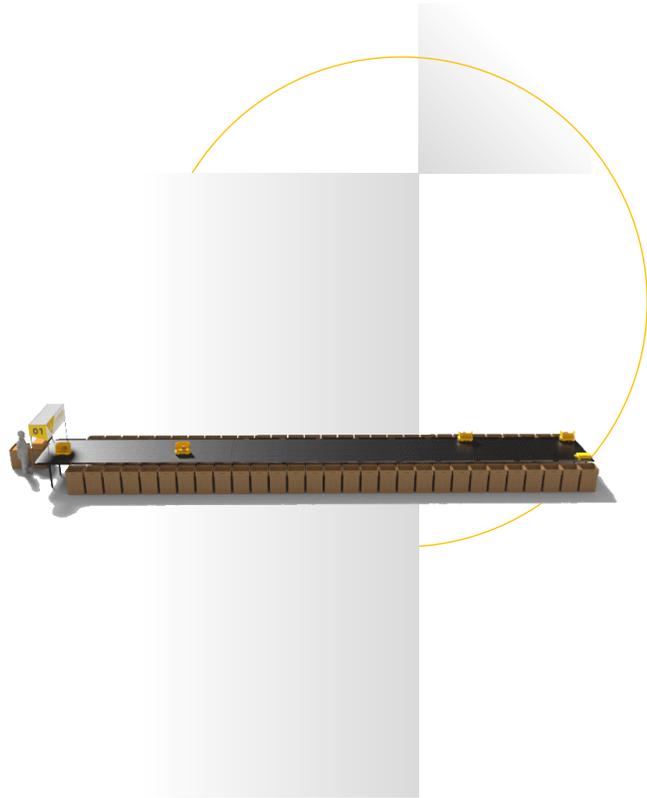
Robots Online : 79/79
Average Voltage : 4743mV
Scanners Online : 0
Data Recovery : offline
To WES : Offline
From WES : Offline
Libiao Box : Offline

Coordinate:
Robot:
Type:
Name:
Status:
Grid Code:

All Power On

All Power Off

2022-11-16 12:12:30.958 : Platform name is Goldair, map file is Platforms\Goldair\Goldair_D_256X8X75_Final
2022-11-16 12:12:31.582 : Switch running mode to Sorting
2022-11-16 12:12:59.558 : Switch running mode to Random Running
2022-11-16 12:13:41.981 : Service Start Succeed!



Flexibility

- Modular design, strong scalability, convenient deployment
- Can increase or decrease the of number of robots as required, quickly improving the sorting efficiency during peak season.
- Can be designed as single layer, double layer or multi-layer according to space and requirements



Rapid Deployment

- Installation needs usually only 1-2 months, while the construction period for a traditional cross-belt system is 6-7 months.
- When the site conditions are relatively perfect, it takes only 2-3 weeks



Efficiency, Accuracy & Stability

- Sorts 200-10,000 destinations in big waves
- 99.99% sorting accuracy
- Highly fault tolerant
- Single point failure does not affect the overall operation stability.



Energy saving

- Low power consumption which results to low operation costs



Low Space Occupation

- Small footprint, saves up to 30% - 50% space
- With double layer we can double the sorting capacity for the same space occupancy



High ROI

- Capital investment is flexible and can be carried out in stages/waves as the system grows
- Estimated ROI is between 2-3 years and can be even better depending on the business case



Key differentiators

- Proven technology on large scale projects
- Very small footprint (can double capacity using the same footprint with second layer)
- Performs much like a tilt tray or cross-belt sorter without a fixed track
- Flexible, expandable and fault tolerant
- Independent from the floor quality (anomalies, obstacles, etc)
- Can be faster than Floor Sorting systems





References

Reference Markets



Libiao Installations





Background

Skechers` biggest warehouse in Great China Region, planned to serve all the stores located in provinces of East China. Capable to sort 426 orders at the same time, increased sorting efficiency by 300% compared with manual sortation.

Type

Double-layer Tsort System

Number of Robot

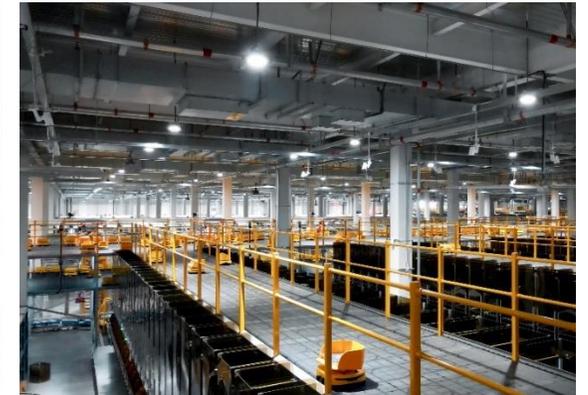
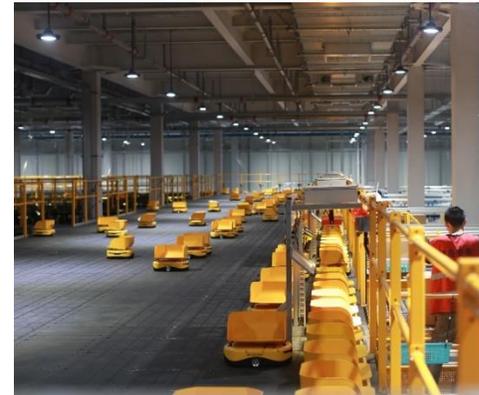
360 units

Number of Induction Station

16

Sorting Capacity

13,000 packages per hour





Background

Itochu is a 3PL company and one world top 500, deployed 3 double-layer 3D sorting systems, 1 single layer 3D system, and 1 system for returns in its 1,800 m² warehouse in Jiangsu province. The systems doubled its efficiency while significantly reduced space occupation.

Type

3D sorting Systems + Tsort system

Number of Robot

Robot 360 units , 3D sorters 120 units

Number of Destination

4500

Sorting Capacity

23,000 packages per hour



Printec Installations (Greece)



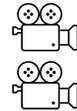
Postage - Courier

3PL

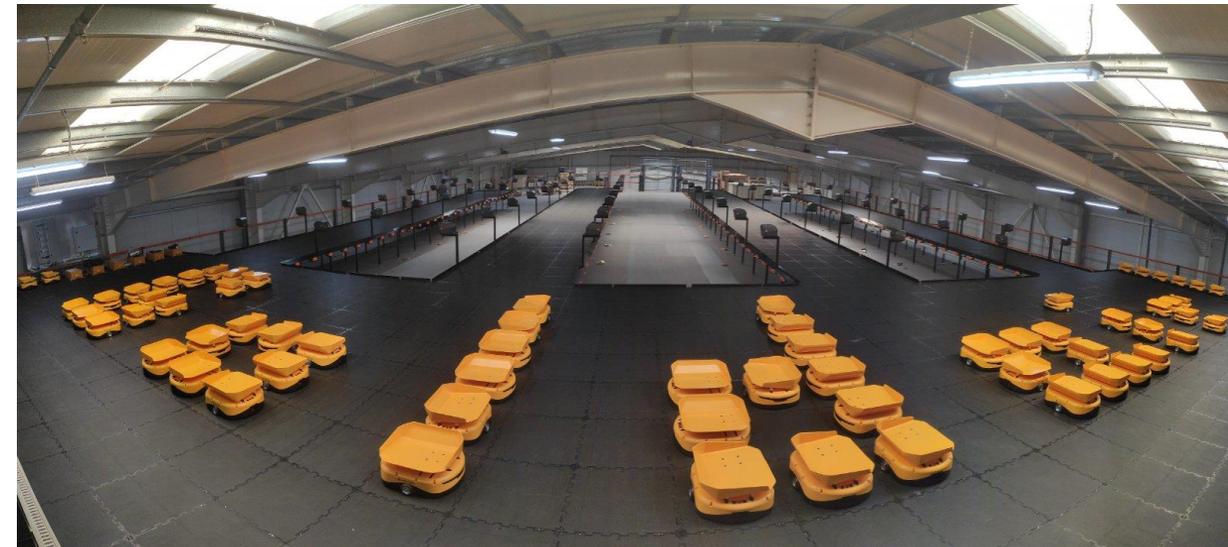
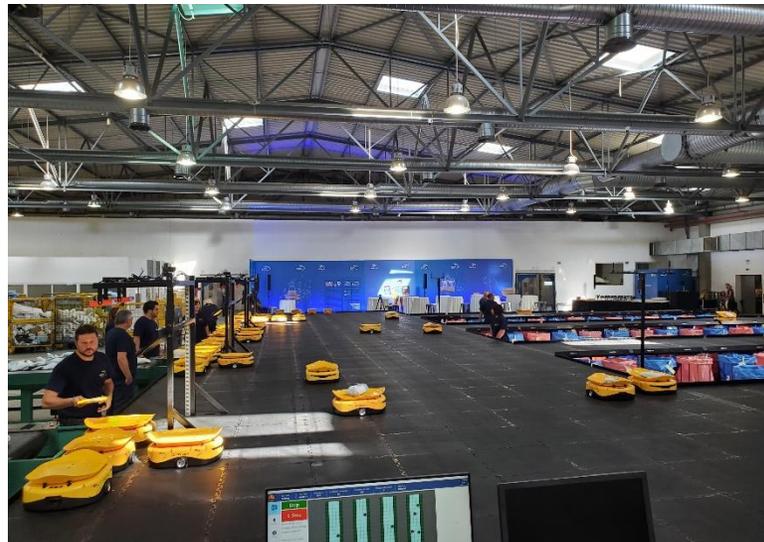


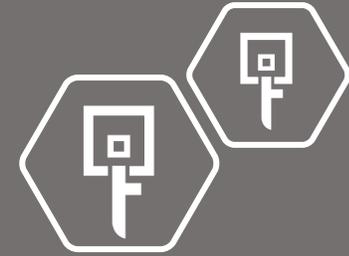
Goldair cargo s.a.

Athens (Central) DC : 120 Robots / 192 Destinations / 7000 pph
Thessaloniki DC : 45 Robots / 120 Destinations / 3000 pph



Athens : 75 Robots / 256 Destinations / 3500 pph





Given that :

- Technology is already stable and mature
- Benefits are tangible
- Challenges for Distribution Centers are real
- Competition is strong
- Adoption is still very low

First Movers' will enjoy a real Competitive Advantage

Next Steps



Collect data and prepare a real business case especially for you

Printec

Basic Parameters Questioner

Basic Information

Project Name / Customer			
Project Location		Greece	EMEA
	MIN	AVG	MAX

Parcel Data

Sorting Capacity per hour (Pieces/Parcels per Hour)			
Working Hours per Day			
Wave Cycles			
Wave Duration Per Cycle (Hours)			
Parcel Dimension (mm)			
Parcel Dimension (mm)			
Parcel Dimension (mm)			
Parcel Weight Range (kg)			
Items to be sorted are Fragile?	No		

Available Area for Sorting Platform

Is the Area Square/Rectangle	Yes		
Are there any obstacles within this area (i.e. Building columns, Fire Exits, etc)	No		
Available Length (m)			
Available Width (m)			
Available area and height (m ²)			
Area height (m)			
Ignore			

Number of Exits/Destinations needed			
Exit Length (mm)			
Exit Width (mm)			
Exit Height (mm)			
Outlet Form of Exits (cartons, workbins, sacks, pallets, belts, cage carts)	Cage Cart		
AVG Number of parcel/pieces for each order/destination			
Parcel/Pieces Inlet Form (Input form for Induction i.e. cartons, conveyor belt, pallets, etc)	Cage Cart		

Next Steps

Design a system, tailored for your specific needs and/or present alternative scenarios.

Provide you simulation results and cost estimation for any alternative scenario in order to calculate your ROI

The screenshot displays a control interface for a robotic system. At the top, a status bar shows: Run Mode: Random Running (with a smiley face icon), Run Time: 00:10:46, Throughput: 771, Last Minute Throughput: 72, Throughput Per Hour: 4291, Throughput Per Minute: 72, and Stop Time: 00:00:00. Below this, a sidebar on the left contains icons for Server, Robots, Options, MagView, Diagnostic, and Tools. The main area features a large grid with vertical lanes. A green 'Stop' button and a red 'E-Stop' button are positioned above the grid. To the right of these buttons, system status is listed: Robots Online: 79/79, Average Voltage: 4743mV, Scanners Online: 0, Data Recovery: offline, To WES: Offline, From WES: Offline, and Libiao Box: Offline. At the bottom left, there are 'All Power On' and 'All Power Off' buttons. A log window at the bottom right shows the following entries: 2022-11-16 12:12:30.958 : Platform name is Goldair, map file is Platforms\Goldair\Goldair_D_256X8X75_Final; 2022-11-16 12:12:31.582 : Switch running mode to Sorting; 2022-11-16 12:12:59.558 : Switch running mode to Random Running; 2022-11-16 12:13:41.981 : Service Start Succeed!





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THANK YOU



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