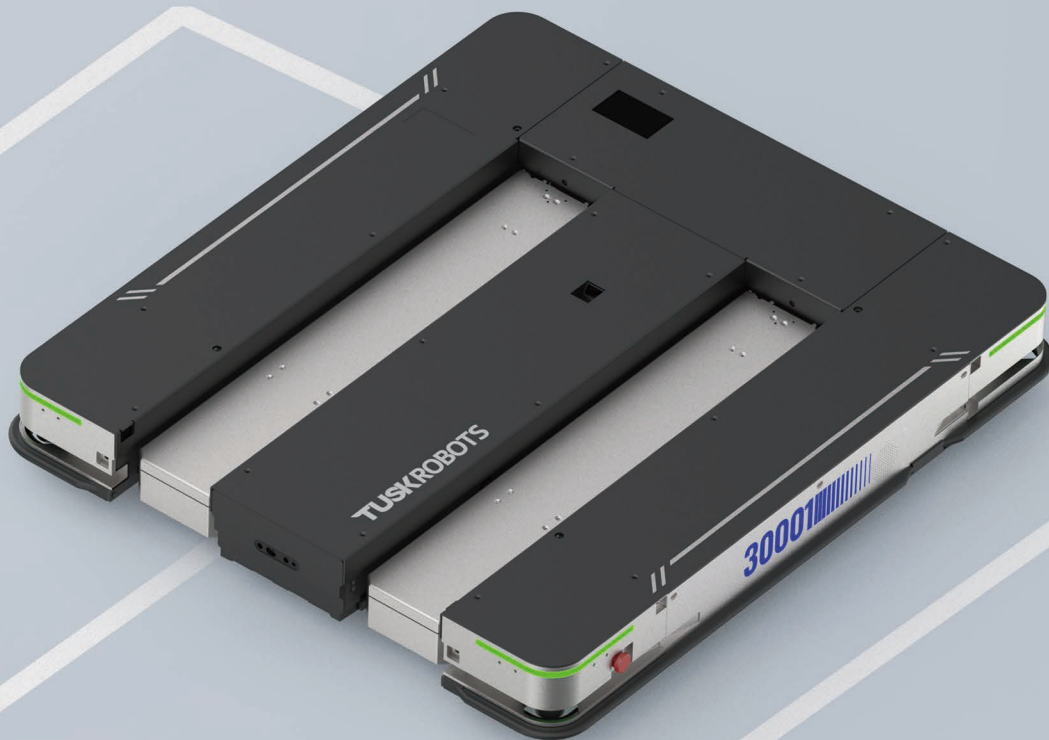


TUSKROBOTS

APR Creator

2024A



Start with Intelligence
Growth with Sincerity

About TUSKROBOTS

Tuskrobots devote ourselves to empowering factory and logistics to become intelligent, making handling easier and more efficient. We take the lead in launching this handling and picking intelligent robot product with global unique innovation which can highly fit in the international standard pallets. TUSKROBOTS is head-quartered in Foshan, Guangdong, with production facilities based there as well. We have local customer service/support teams in Beijing, Shanghai, Hangzhou, Suzhou, Wuhan, Changsha, Chengdu, and Chongqing. Our versatile robotic solutions find extensive applications in industries such as automotive, pharmaceutical, tobacco, new energy, electronics, and commercial trade, enabling businesses to achieve higher efficiency and safety through continuous automation in material handling.



130+

Global Plant Patents

100+

R&D Personnel

20+

Industrial Applications

30+

Global Channel Coverage



APR Series

No Auxiliary Equipment Required



Robot Scheduling System

Integrated Platform System, Visual Bin Detection



Diverse Accessory Products

Supporting Various Business Scenarios

Honors



CE Marking



ISO9001



2023 RBR50 Robotics Innovation Awards



Red Dot Design Award



IF Design Award



LT Award



GG-Led Golden Globe Award



Golden Ant Awards



World Innovation Award



Equal Ocean Rising Global Enterprises Top50



Outstanding Industrial Robotics Companies

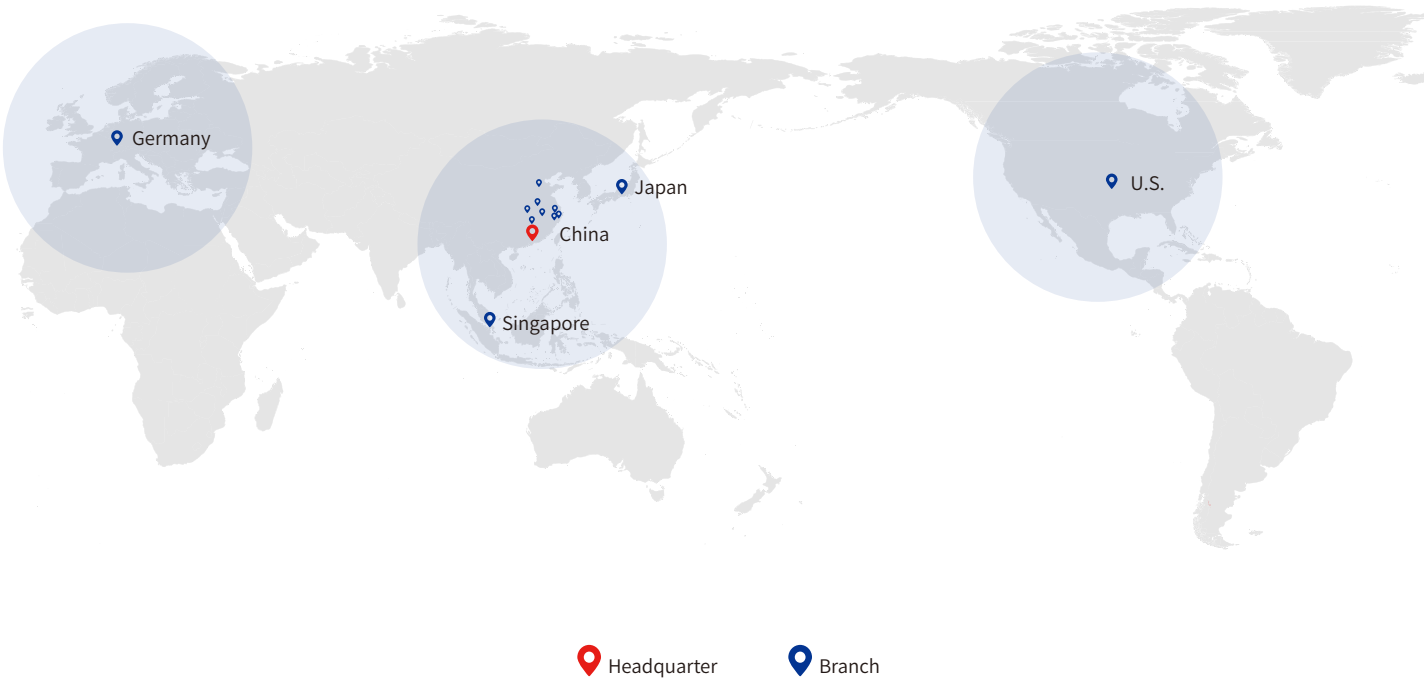


56 PinPai

China Headquarter
Foshan

China Branches
Beijing/Shanghai/hangzhou

After-sales service network extends globally including Europe, North America, and Southeast Asia.



Implementation of Preparation

Equipment Inventory
On-Site Review of the Solution
Check of Implementation Conditions
Software Pre-Integration and Debugging

Implementation in Project Site

DM Code Construction、SLAM Mapping
System Map Drawing System
Environment and Parameter Configuration
Software and Hardware Debugging

Launch and Support

User Training / Launching Trial Run
Handbook Information Handover /
Maintenance Training
Sign for Acceptance
After-sale Technical Support Service



7x24 remote technical support



On-Site Maintenance Service



Preventive Maintenance Service



Peak On-Site Support Service



Accessories and Tooling Equipment Package



Technical Training Service



System Upgrade and Maintenance Service



Annual Framework Service

Company History

2019

- 1.Introducing our second-generation Omni-directional Pallet Robot, which underwent on-site testing and application with our esteemed angel customer.
- 2.We participated in the Shanghai Logistics Expo, making our first public appearance.

2021

- 1.Continuously secured multiple rounds of funding totaling billions of RMB.
- 2.Established a production base in Foshan.
- 3.Launched the fourth-generation robot, along with the SLAM navigation edition.
- 4.Introduced a large-scale robot cluster scheduling system, wireless control module, and terminal app, which extensively support the integration of automatic doors, elevators, robotic arms, and other equipment, enabling a comprehensive pallet robot system solution.
- 5.Projects in the renewable energy and automotive electronics industries have been effectively implemented.

2023

- 1.Initiated global expansion by establishing branches in North America, Europe, Japan, and Southeast Asia
- 2.Actively engaged in international exhibitions such as PROMAT in the U.S., HANNOVER MESSE in Germany, and KANSAI LOGISTICS EXPO in Japan, strategically expanding our presence in the global market.
- 3.Introduced the sixth-generation high-performance E-Series pallet robot.
- 4.Awarded the prestigious international Red Dot Design Award and the German iF Design Award.
- 5.Honored to receive the "Logistics Oscars," the LT China Logistics Technology Award for Innovation in Product.
- 6.Awarded the 2023 RBR50 Global Robotics Innovation Award, making us the only Chinese company to receive this prestigious honor

2020

- 1.Launched the third-generation industrial-grade version and introduced the multi-robot scheduling management system to the market.
- 2.Successful implementations in pharmaceutical and 3C industries.
- 3.Introducing the E-Series: Our First Differential Pallet Robot

2022

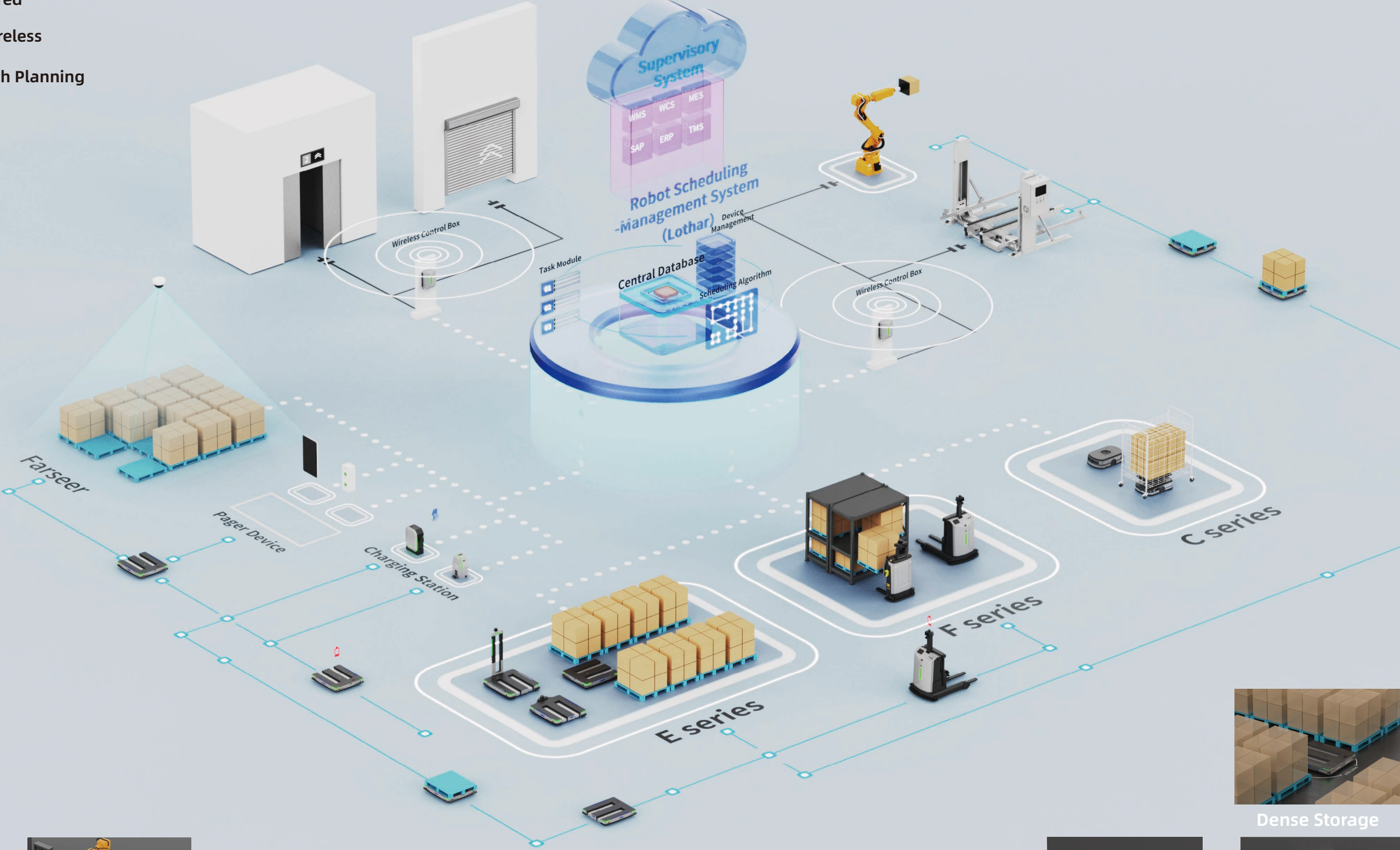
- 1.Established multiple regional marketing and after-sales operation centers to provide global coverage
- 2.Obtained the ISO 9001 quality management system certification.
- 3.Introduced the fifth-generation heavy-duty 1.2t APR
- 4.Introduced the F-Series forklift-style robot and C-Series lift-style robot.
- 5.Leveraging deep learning technology, we proudly launched the fourth-generation robot management system with support for visual bin detection.
- 6.We participated in the Chinese logistics exhibition for the first time and received the Golden Ant Award.
- 7.We have successfully implemented over 100 cases across 20+ industries, earning recognition and repeat orders from multiple Fortune Global 500 companies. The APR product started to widely promoted within China.

2018

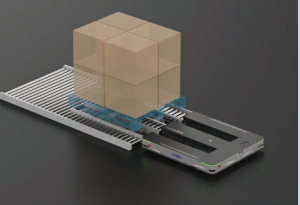
- 1.Innovatively introduced the concept of the APR (Automated Pallet Robot).
- 2.The founding team initiated the R&D process, conducting prototype validation.

APR Scene Architecture

- Wired
- Wireless
- Path Planning



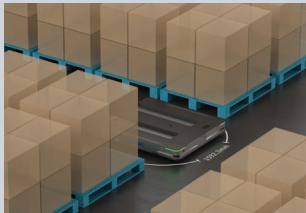
Lift Conveyor Line



Ground Roller



Robotic Arm



Dense Storage

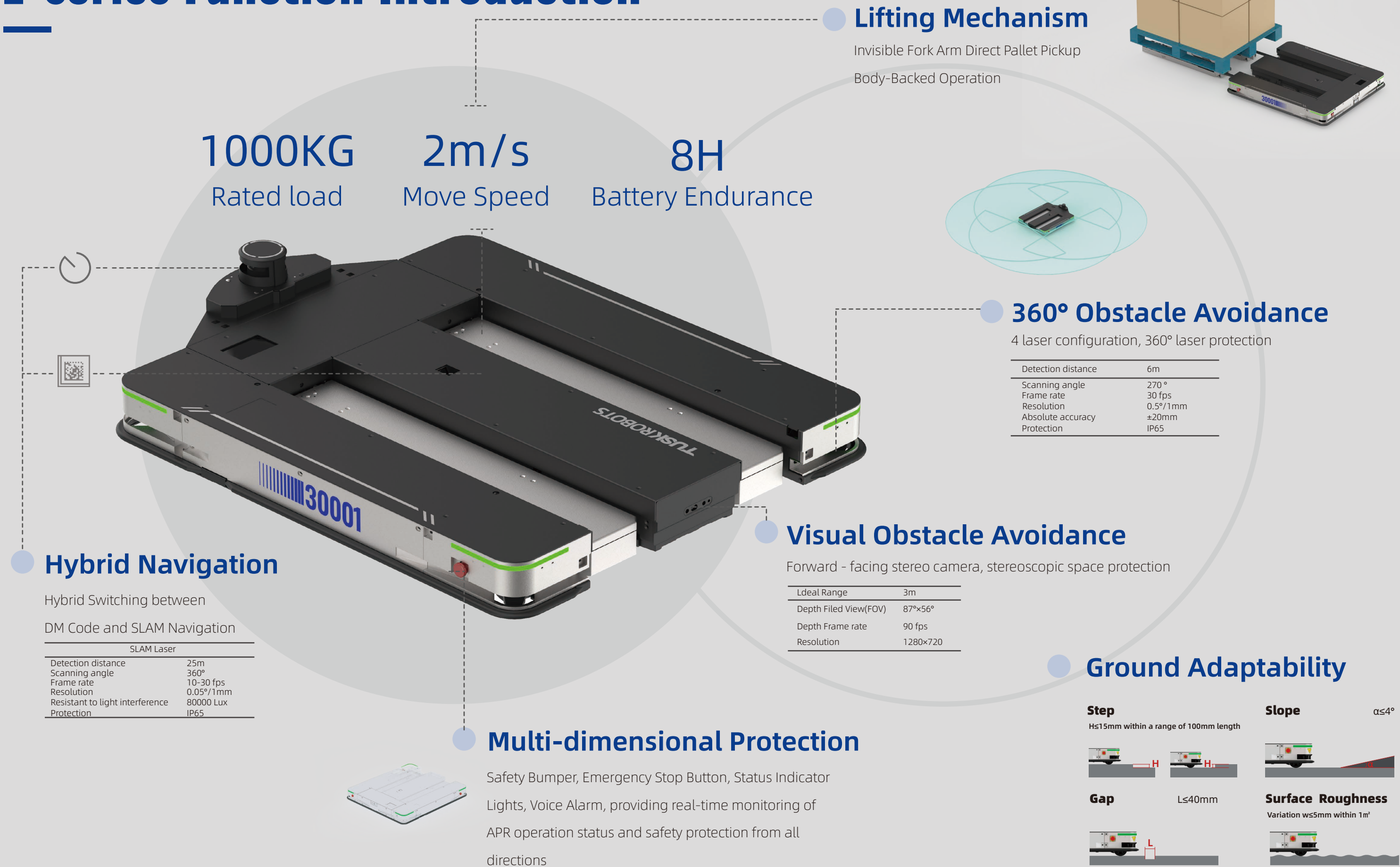


Elevator



Automatic Door

E-series Function Introduction



E10

■ Standard Pallet

Available for 1000*1200mm plastic pallet handling

■ Narrow Aisle

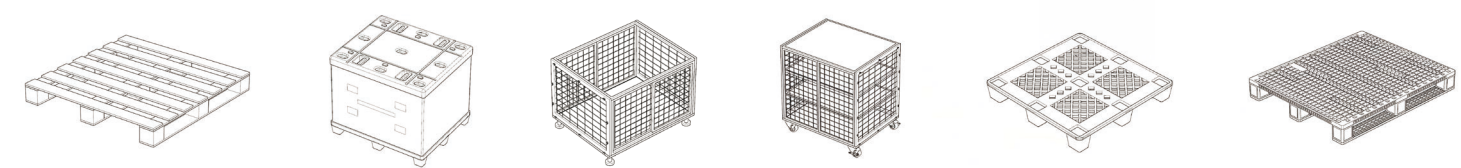
The minimum width of pallet handling aisle is 1800mm

■ High-level Safety

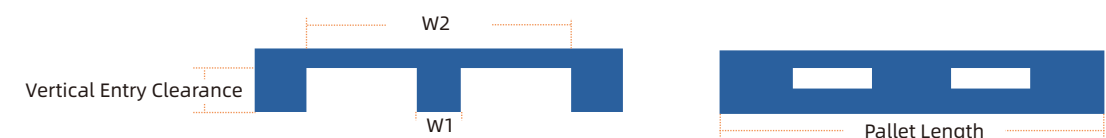
360° laser obstacle avoidance detection, cargo detection, etc.

■ Equipment Docking

Multi-equipment types docking support, - such as lift, elevator, mechanical arm, etc.



Project	Specifications	E10	E10-SLAM
Basic Parameters	Size(mm)	1233×1102×170	1399×1102×170 (SLAM component can be elevated)
	Rated Load (kg)	1000	
	Self-Weight (kg)	310	320
	Fork Height (mm)	90(7mm downward floating height with loading)	
	Fork Stretch Out Max Limit (mm)	1400	
	Fork Max Lifting Height (mm)	≤330	
	Display Screen	5 inches	
	Telecommunication Modes	Default WIFI version: Support dual-band 2.4G/5G, IEEE802.11b/g/n (-5G version support 5G communication)	
Safety Protection	Obstacle Avoidance Protection	Front laser sensors + Rear laser sensors, 360° obstacle avoidance detection	
	Detection Distance of Front Laser(m)	0-3	
	Mechanical Protection	Emergency stop button , Reset button , A protection strip around the whole vehicle body	
	Caution Function	With voice and photoelectric alarm functions	
	Fork tip protection	collision switch	
Movement Capability	Navigation Mode	DM code	SLAM + DM code Dual Navigation
	Maximum Speed (Empty Load/Full Load)(m/s)	2.0 / 1.5	
	Rated Acceleration(m/s²)	1	
	Stop Accuracy	±5mm / ±1°	±20mm / ±2°
	Movement Mode	two-wheel differential	
	Ground Adaptation Gap Slope Step	40mm(Gap)/4°(7%)(Slope)/15mm(Step)	
	Maximum Slope when the Fork Extension reach to the Maximum	2°	
Lithium Battery Performance	Rated Voltage/Capacity	51.2V/30AH	
	Battery Life	The times of fully charging: 1500 times (The battery capacity is guaranted to be more than 70% of the new battery)	
	Battery Endurance/Charging Time	≥8H/≤2H	
	Battery Type	LFP	
Environment	Operating temperature(°C)	0~45	
Pallet Requirement	The Width of W1 and W2 (mm)	W1≤190, 700≤W2≤970	
	Pallet Length (mm)	≤1400	≤1300
	Vertical Entry Clearance(mm)	95-130	



E10(Titan)

Heavy Load Handling

Capable of handling loads up to 1.5 tons

Narrow Aisle Passable

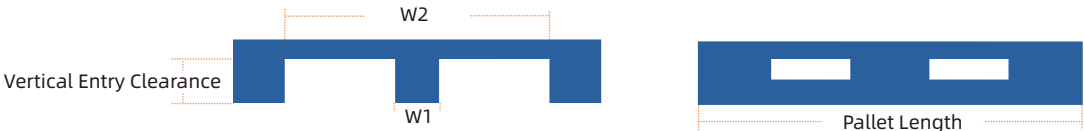
APR can spin around

High-level Safety

360° obstacle avoidance detection,cargo detection, etc.



Project	Specifications	E10(Titan)		E10-SLAM(Titan)
Basic Parameters	Size(mm)	1233×1102×170 (Include the protection strip)		1399×1102×170 (SLAM component can be elevated)
	Maximum Lifting Weight (kg)	Rated 1200KG, Max 1500KG		
	Self-Weight (kg)	310		320
	Fork Height (mm)	90(7mm downward floating height with loading)		
	Fork Stretch Out Max Limit (mm)	1400		
	Maximum Lifting Height (mm)	≤330		
	Display Screen	5 inches		
	Telecommunication Modes	Default WIFI version: Support dual-band 2.4G/5G, IEEE802.11b/g/n (-5G version support 5G communication)		
Safety Protection	Obstacle Avoidance Protection	Front double laser sensors + Rear double laser sensors		
	Detection Distance of Front Laser(m)	0-3		
	Mechanical Protection	Emergency stop button, Reset button, A protection strip around the whole vehicle body		
	Caution Function	With voice and photoelectric alarm functions		
	Fork tip protection	Photoelectric sensor detection distances≤100mm, collision switch		
Movement Capability	Navigation Mode	DM code	SLAM + DM code Dual Navigation	
	Maximum Speed (Empty Load/Full Load)(m/s)	1.5 / 1.2		
	Rated Acceleration(m/s²)	1		
	Stop Accuracy	±5mm /±1°	±20mm /±2°	
	Movement Mode	Dual-wheel differential		
	Ground Adaptation Gap Slope Step	40mm(Gap)/4°(7%)(Slope)/15mm(Step)		
	Maximum Slope when the Fork Extension reach to the Maximum	2°		
Lithium Battery Performance	Rated Voltage/Capacity	51.2V/30AH		
	Battery Life	The times of fully charging: 1500 times (The battery capacity is guaranted to be more than 70% of the new battery)		
	Battery Endurance/Charging Time	≥6H/≤1.5H		
	Battery Type	LFP		
Environment	Operating temperature(°C)	0~45		
Pallet Requirement	The Width of W1 and W2 (mm)	W1≤190, 700≤W2≤950		
	Pallet Length (mm)	≤1400	≤1300	
	Pallet Opening Height (mm)	120-130		



E10(Arctic)

Cold storage APR

Hot & Low Temperature Operation

Operating temperature -20°C - 30°C

High Temperature Difference

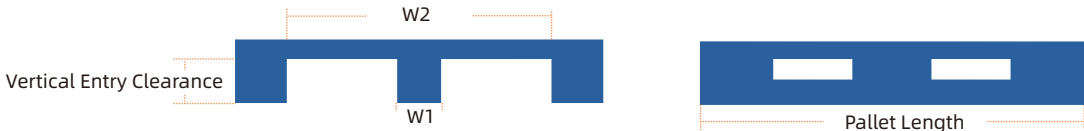
Suitable for the temperature difference of 30°C

Multiple Waterproof

Structure and electronic devices multiple waterproof



Project	Specifications	E10(Arctic)		E10-SLAM(Arctic)
Basic Parameters	Size(mm)	1233×1102×170	1399×1102×170 (SLAM component can be elevated)	
	Rated Load (kg)	1000		
	Self-Weight (kg)	323	333	
	Fork Height (mm)	90(7mm downward floating height with loading)		
	Fork Stretch Out Max Limit (mm)	1400		
	Fork Max Lifting Height (mm)	≤330		
	Display Screen	5 inches		
	Telecommunication Modes	Default WIFI version: Support dual-band 2.4G/5G, IEEE802.11b/g/n (-5G version support 5G communication)		
Safety Protection	Obstacle Avoidance Protection	Front Dual Laser + Rear Laser Sensor, 360° Obstacle Avoidance Detection		
	Detection Distance of Front Laser(m)	0-3		
	Mechanical Protection	Emergency stop button , Reset button , A protection strip around the whole vehicle body		
	Caution Function	With voice and photoelectric alarm functions		
	Fork tip protection	Photoelectric sensor detection distances≤100mm, collision switch		
Movement Capability	Navigation Mode	DM code	SLAM + DM code Dual Navigation	
	Maximum Speed (Empty Load/Full Load)(m/s)	2.0 / 1.5		
	Rated Acceleration(m/s²)	1		
	Stop Accuracy	±5mm / ±1°	±20mm / ±2°	
	Movement Mode	Two-wheel differential		
	Ground Adaptation Gap Slope Step	40mm(Gap)/4°(7%)(Slope)/15mm(Step)		
	Maximum Slope Gradient for Fork Arm Extension	2°(3.5%)		
Lithium Battery Performance	Rated Voltage/Capacity	51.2V / 30AH		
	Battery Life	The times of fully charging: 1500 times (The battery capacity is guaranted to be more than 70% of the new battery)		
	Battery Endurance/Charging Time	≥6H / ≤2H		
	Battery Type	LFP		
Environment	Operating temperature(°C)	-10~50		
	Temperature Variance(°C)	≤30		
Pallet Requirement	The Width of W1 and W2 (mm)	W1≤160, 600≤W2≤800		
	Pallet Length (mm)	≤1400	≤1300	
	Vertical Entry Clearance(mm)	95-130		



E08

■ EPAL Euro Pallet

Available for EPAL Euro pallet handling

■ Narrow Aisle

The minimum width of pallet handling aisle is 1700mm

■ High-level Safety

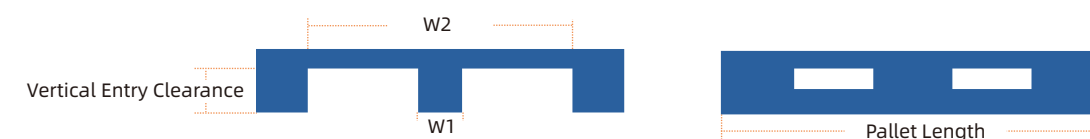
360° obstacle avoidance detection,cargo detection, etc.

■ Equipment Docking

Multi-equipment types docking support, such as lift, elevator, mechanical arm, floor roller, etc.



Project	Specifications	E08		E08-SLAM
Basic Parameters	Size(mm)	1283×983×170	1451×983×170 (SLAM component can be elevated)	
	Rated Load (kg)	1000		
	Self-Weight (kg)	290	300	
	Fork Height (mm)	90(7mm downward floating height with loading)		
	Fork Stretch Out Max Limit (mm)	1400		
	Fork Max Lifting Height (mm)	≤330		
	Display Screen	5 inches		
	Telecommunication Modes	Default WIFI version: Support dual-band 2.4G/5G, IEEE802.11b/g/n (-5G version support 5G communication)		
Safety Protection	Obstacle Avoidance Protection	Front double laser sensors + Rear double laser sensors		
	Detection Distance of Front Laser(m)	0-3		
	Mechanical Protection	Emergency stop button, Reset button, A protection strip around the whole vehicle body		
	Caution Function	With voice and photoelectric alarm functions		
	Fork tip protection	Collision switch		
Movement Capability	Navigation Mode	DM code	SLAM + DM code Dual Navigation	
	Maximum Speed (Empty Load/Full Load)(m/s)	1.5 / 1.2		
	Rated Acceleration(m/s²)	1		
	Stop Accuracy	±5mm /±1°	±20mm /±2°	
	Movement Mode	Two-wheel differential		
	Ground Adaptation Gap Slope Step	40mm(Gap)/4°(7%)(Slope)/15mm(Step)		
	Maximum Slope when the Fork Extension reach to the Maximum	2°		
Lithium Battery Performance	Rated Voltage/Capacity	51.2V/30AH		
	Battery Life	The times of fully charging: 1500 times (The battery capacity is guaranted to be more than 70% of the new battery)		
	Battery Endurance/Charging Time	≥8H/≤2H		
	Battery Type	LFP		
Environment	Operating temperature(°C)	0~45		
Pallet Requirement	The Width of W1 and W2 (mm)	W1≤160, 600≤W2≤800		
	Pallet Length (mm)	≤1400	≤1300	
	Vertical Entry Clearance(mm)	95-130		





■ CE Certification

Full directive CE Certification

■ Multiple Vehicles

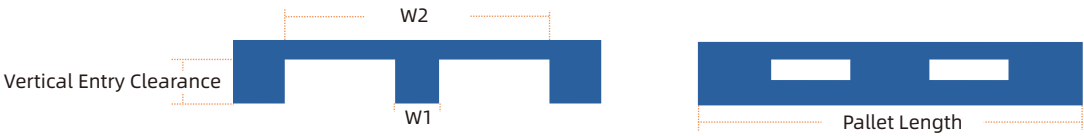
Support National Standard and European Standard Pallets

■ High-level Safety

CE PLd level



Project	Specifications	TusKE	TusKEs
Basic Parameters	Size(mm)	1312×1060×170	1479×1060×295 (SLAM component can be elevated)
	Maximum Lifting Weight (kg)	800	
	Self-Weight (kg)	310	340
	Fork Height (mm)	90(7mm downward floating height with loading)	
	Fork Stretch Out Max Limit (mm)	1400	
	Maximum Lifting Height (mm)	≤330	
	Display Screen	5 inches	
	Telecommunication Modes	Support dual-band 2.4G/5G	
Safety Protection	Obstacle Avoidance Protection	Front double laser sensors + Rear double laser sensors	
	Detection Distance of Front Laser(m)	0-3	
	Mechanical Protection	Emergency stop button, Reset button, A protection strip around the whole vehicle body	
	Caution Function	With voice and photoelectric alarm functions	
	Fork tip protection	Photoelectric sensor detection distances≤100mm, collision switch	
	Security level	PLd	
Movement Capability	Navigation Mode	DM code	SLAM + DM code Dual Navigation
	Maximum Speed (Empty Load/Full Load)(m/s)	1.5 / 1.2	
	Rated Acceleration(m/s²)	1	
	Stop Accuracy	±5mm /±1°	±20mm /±2°
	Movement Mode	Two-wheel differential	
	Ground Adaptation Gap Slope Step	40mm(Gap)/4°(7%)(Slope)/15mm(Step)	
	Maximum Slope when the Fork Extension reach to the Maximum	2°	
Lithium Battery Performance	Rated Voltage/Capacity	51.2V/30AH	
	Battery Life	The times of fully charging: 1500 times (The battery capacity is guaranted to be more than 70% of the new battery)	
	Battery Endurance/Charging Time	≥8H/≤2H	
	Battery Type	LFP	
Environment	Operating temperature(°C)	0~45	
Pallet Requirement	The Width of W1 and W2 (mm)	W1≤160, 600≤W2≤900	
	Pallet Length (mm)	≤1400	≤1300
	Pallet Opening Height (mm)	95-130	



C-series Robot



Project	Specifications	C06		C06C	C10		C10C	CR10		CR10C	CR10-BG		CR10C-BG
Basic Parameters	Rated Load(kg)	600			1000			1000			1000		
	Overall Size(mm)	950×650×250			1150×820×260			950×650×195			950*750*1470 (without warning lights)		
	Rotation Diameter(mm)	965			1201			1000			1000		
	Lifting Height(mm)	60			60			\			\		
	Ground Clearance(mm)	25			25			25			25		
	Lifting Plate Size(mm)	850×600			1030×770			\			\		
	Lifting method	Electric lifting			Electric lifting			\			\		
	Self-weight(kg)	130			180			100			100		
	Communication method	Default WIFI dual-band, 5G optional			Default WIFI dual-band, 5G optional			Default WIFI dual-band, 5G optional			Default WIFI dual-band, 5G optional		
	Navigation Mode	DM Code	DM Code + Laser SLAM		DM Code	DM Code + Laser SLAM		DM Code	DM Code + Laser SLAM		DM Code	DM Code + Laser SLAM	
	LCD Display	Equipped			Equipped			Equipped			Equipped		
Safety Protection	Front Protection	270° Laser			250° Laser			270° Laser			270° Laser		
	Rear Protection	180° Laser			180° Laser			210° Laser			210° Laser		
	Collision Strip Detection	360° Detection			360° Detection			360° Detection			360° Detection		
	Emergency Stop Button	One at the front and one at the rear			One at the front and one at the rear			Two sides & rear, a total of three			Two sides & rear, a total of three		
	Lighting Alerts	Equipped			Equipped			Equipped			Equipped		
	Voice Prompts	Equipped			Equipped			Equipped			Equipped		
	3D Obstacle Avoidance	Optional			Optional			Optional			Optional		
Movement Capability	Maximum Operation Speed (Empty Load/Full Load)(m/s)	2.0 / 1.5			1.8 / 1.5			2.0 / 1.5			2.0 / 1.5		
	Rated Acceleration (Unloaded)(m/s²)	1			1			1			1		
	Stop Angle Accuracy	±5mm / ±1°	±20mm / ±2°		±5mm / ±1°	±20mm / ±2°		±5mm / ±1°	±20mm / ±2°		±5mm / ±1°	±20mm / ±2°	
	Stop Position Accuracy	30mm(Gap) / 3°(5%)(Slope) / 10mm(Step)			30mm(Gap) / 3°(5%)(Slope) / 10mm(Step)			30mm(Gap) / 3°(5%)(Slope) / 10mm(Step)			30mm(Gap) / 3°(5%)(Slope) / 10mm(Step)		
Lithium Battery Performance	Rated Voltage/Capacity	51.2V / 24AH			51.2V / 40AH			51.2V / 30AH			51.2V / 30AH		
	Number of Charge Cycles	Full charge and discharge: 2000 cycles (Battery capacity remains above 70% of new battery)			Full charge and discharge: 2000 cycles (Battery capacity remains above 70% of new battery)			Full charge and discharge: 2000 cycles (Battery capacity remains above 70% of new battery)			Full charge and discharge: 2000 cycles (Battery capacity remains above 70% of new battery)		
	Endurance/Charging Time	≥8H / ≤2H			≥8H / ≤2H			≥8H / ≤2H			≥8H / ≤2H		
	Battery Type	LFP			LFP			LFP			LFP		
Environment	Operating Temperature(°C)	0~45			0~45			0~45			0~45		

FH14

Stacker Forklift Robot

■ 1.4t

Maximum Load

■ 1.6m

Maximum Lifting Height

■ Open Pallet

Pallet Adaptation



■ 1.4t

Maximum Load

■ 1.6m

Maximum Lifting Height

■ Open and Closed Pallet

Pallet Adaptation

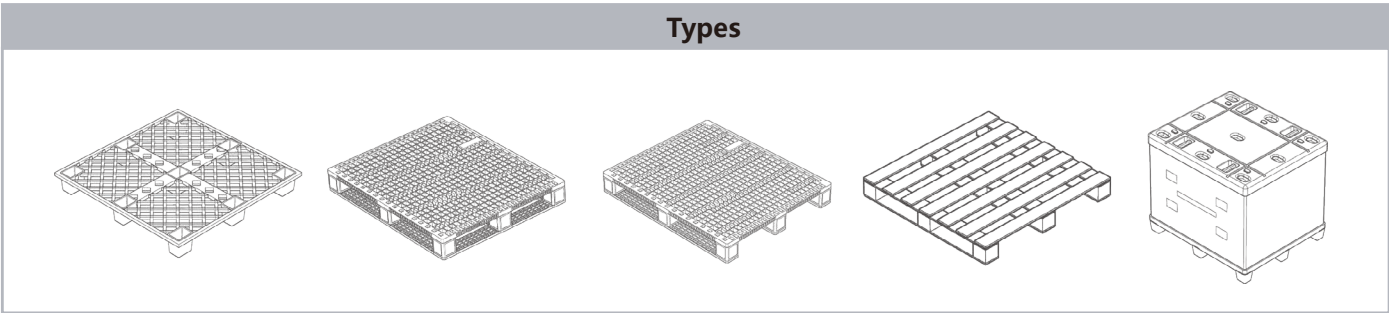


FM14

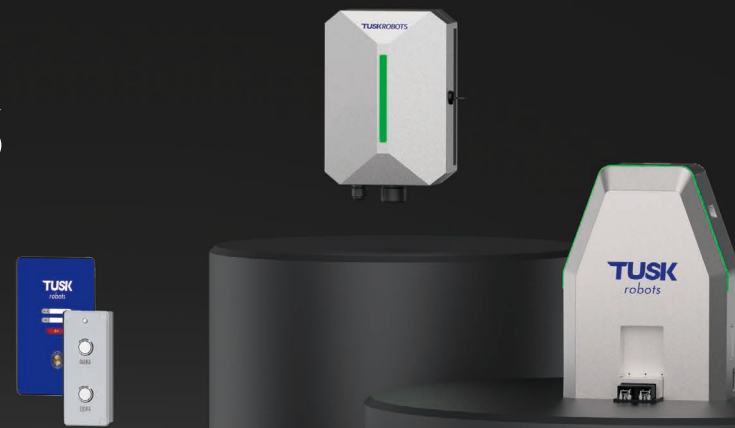
Forward-Moving Forklift Robot

Project	Specifications	FH14	FM14
Basic Parameter	Drive Mode	Steering wheel	Steering wheel
	Navigation ModeR	Laser slam	Laser slam
	Self-weight(kg)	880	1890
	Rated Load(kg)	1400	1400
	Standard Lifting Height(mm)	1600	1600
	Fork Height from Ground Level (at its lowest position)(mm)	90	-
	Navigation Laser Scanning Height(mm)	1900	1850
	Overall Size(L*W*H)(mm)	1665*950*2000	2077*1200*2120
	Fork Size(L*W*H)(mm)	1150*190*60	1200*122*40
	Fork Outside Distance(mm)	560/680	650
	Ground Clearance(Wheelbase Center)(mm)	25	30
	Turning Radius(mm)	1150	1480
	Telecommunication Modes	Default WIFI version: support dual-band 2.4G/5G, IEEE802.11b/g/n (-5G version support 5G communication)	
	HMI Display Screen	10 inches	7 inches
Movement Capability	Work Noise Level dB(A)	≤73	≤70
	Operation Speed (Empty Load/Full Load)(m/s)	1.5 / 1.0	1.7 / 1.4
	Positioning Accuracy(mm)	±20	±20
	Angle Accuracy(°)	±2	±2
	Fork Lifting Speed (Full Load/Empty Load) (mm/s)	115/175	115/170
	Fork Lowering Speed (Full Load/Empty Load) (mm/s)	160/128	114/114
Battery Parameters	Ground Adaptation(Slope/Step/Gap)	≤5%/10mm/30mm	≤5%/15mm/30mm
	Battery Capacity	24V/200Ah	24V/180Ah
	Battery Life	Times of fully charging over 1500	Times of fully charging over 1500
	Endurance Time/Charging Time	≥10H/≤2H	≥8H/≤2H
	Charging Mode	AUTO/Manual	AUTO/Manual
Safety Functions	Battery Type	LFP	LFP
	Obstacle Avoidance Laser	360° Laser Protection	360° Laser Protection
	Mechanical protection	Vehicle Body Semi-Wrap Bumper Guard	Vehicle Body Semi-Wrap Bumper Guard
	Pallet Position Detection	Dual In-Position Inspection, Contact-Type	Dual In-Position Inspection, Contact-Type
	Fork Tip Collision Detection	Photoelectric Detection	Photoelectric Detection
	Emergency Stop Button	Left/Right Emergency Stop Button	Left/Right Emergency Stop Button
	Audio-Visual Alarm	Audio-Visual Alarm	Audio-Visual Alarm

CARRIER ADAPTATION



Accessories



Calling Device

One-Click Call

Call tasks directly with a single button press.

Fault Location

Achieve fault location through an intelligent system.

Live Monitoring

Real-time display of task status, location information, and equipment status.

User-Friendly Operation

Visualized operational logic for easy and intuitive operation and equipment status.



Charging Station



System Control

Wireless Communication and Centralized System Control

Intelligent Control

Real-time monitoring of temperature and current
Overcurrent, Overvoltage, and Overheat Protection, Intelligent Cooling

Intelligent Identification

Charging Identity Recognition and Access Inspection

Protection

Electric Shock Protection, Protection against Motor Exposures and Foreign Object Detection

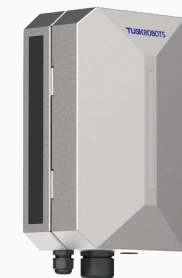
Dual-Charging Mode

Supports Manual and Automatic Mode Switching

Communication Module

Supports Dual-band WiFi and Mobile 5G Communication

Wireless Control Box



IO Interface

Provides Multiple Digital Input and Output Interface and equipment status.S

Communication Interface

Provides RS232 and RS485 Communication Interfaces

Network Connectivity

Support dual-frequency WIFI and 5G communication

Customization

Supports Customizable and Multiple Protocols.

Various Devices

Supports integration with automatic doors, elevators, signal lights, and other devices

Third Party

Supports Third-party Device Integration into the System

Instanders for forklifts

Fingerprint login

Log in through fingerprints, identify, control driving permissions;

Safety belt detection

Whether to wear a seat belt detection to ensure the driver's safety

Intelligent speed measurement

In real-time detection of forklift operation speed, providing reference and overspeed alarm for the driver

Sound and light alarm

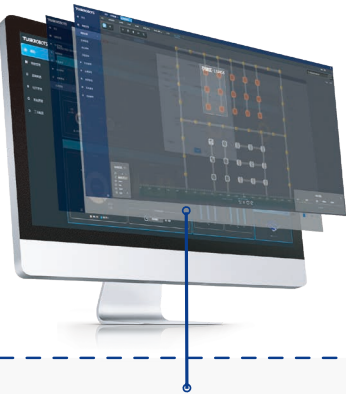
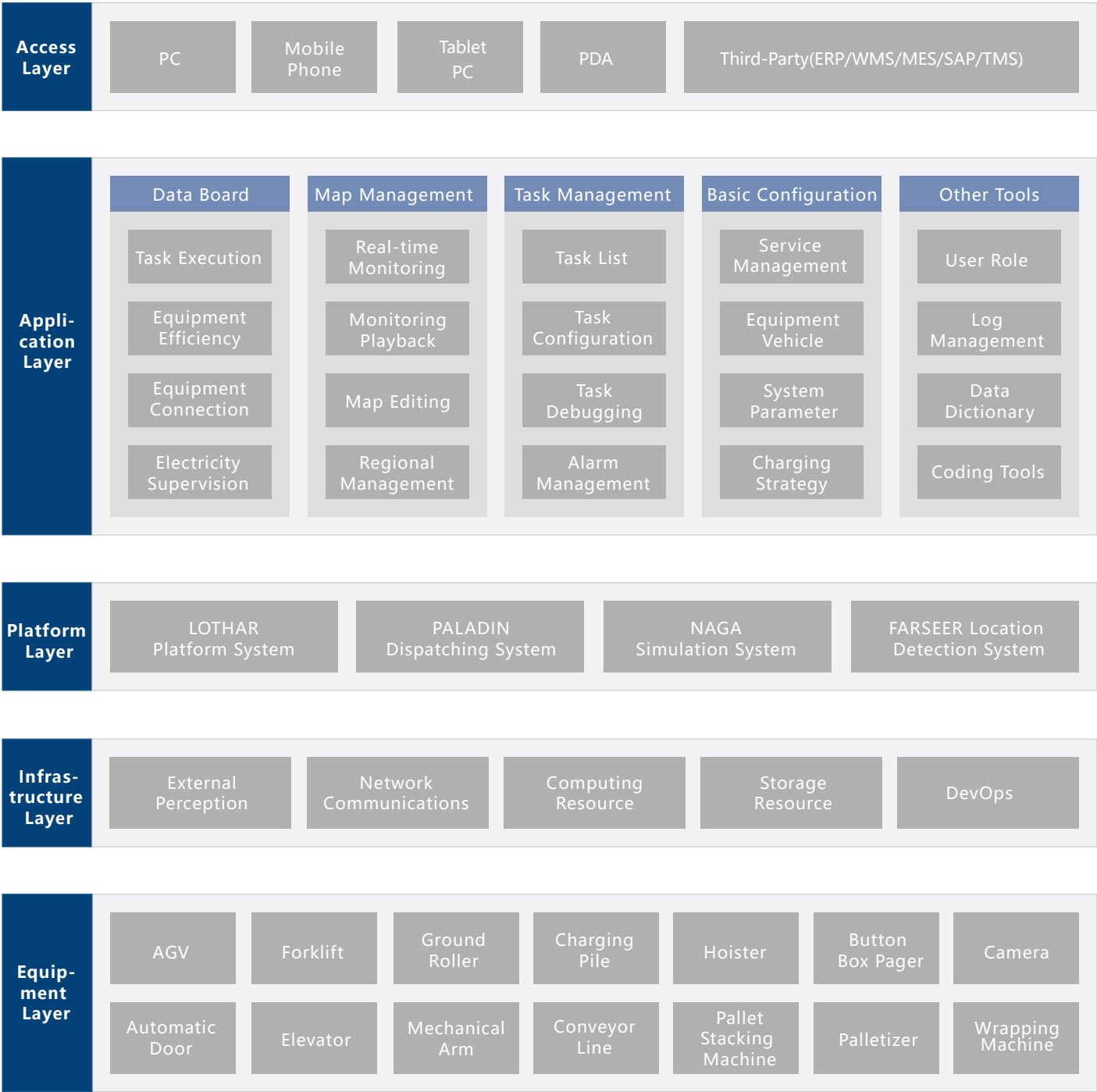
Equipped with sound and light alarms, providing multiple sensory prompts



Software System Introduction



Tusk Intelligent Management Platform

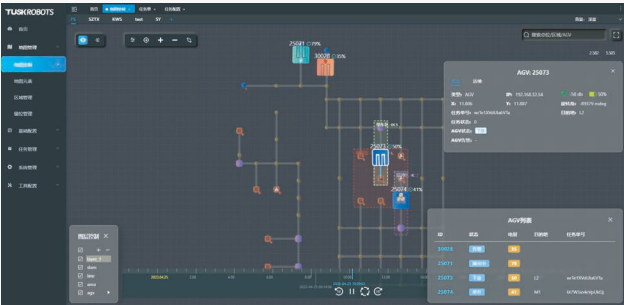


Real-Time Display



Homepage Data Dashboard

Offering real-time and historical visualized data to empower data analysis and aid in business decision-making.

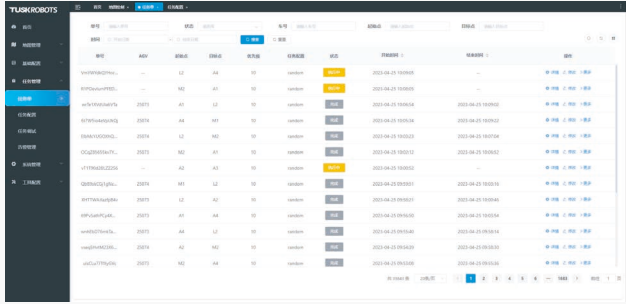


Real-time Map Tracking

Quick and easy visualization of map construction enables real-time monitoring of on-site conditions at project location



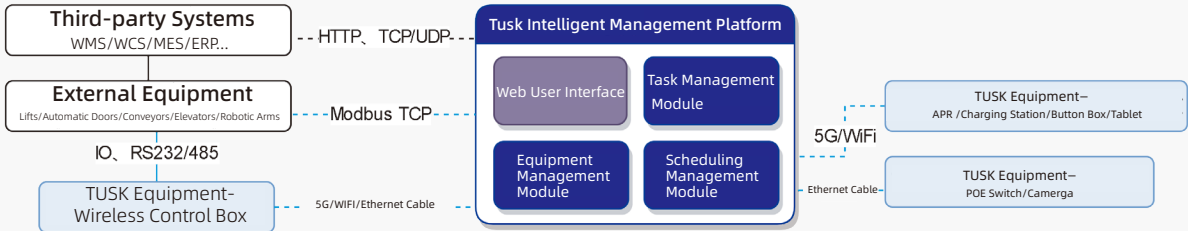
Task Management



- Transportation Mode: Combination of Point and Area Handling,
- Picking Mode: Call from Operation Station,
- Fixed Mode: Initialization, Clearing, and Organizing,
- Collaborative Mode: Multi-vehicle Collaborative Box Picking,
- Manual Mode: Manual Task Assignment, Cancellation, and Designated Charging



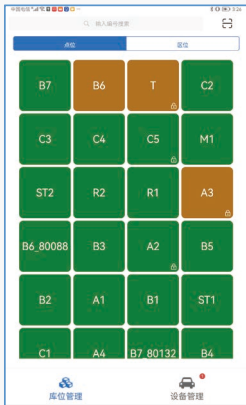
External Interface



Mobile Application

TUSKROBOTS' self-developed mobile app for Android devices offers real-time management of storage locations, zones, and device status. It facilitates quick task initiation, simple inventory management, and device anomaly alerts. With an intuitive UI design, it ensures low learning curve and easy usage for operators.

-  Supports All Android Devices
-  Exception Diagnosis
-  Real-time Query of Devices
-  Easy Inventory Management
-  Swift Initiation of Tasks
-  DM Code Scanning Input



Location Management



Point/Area Operation

Performing inbound and outbound operations in designated location



Device Management

Case

Automotive Electronics Industry



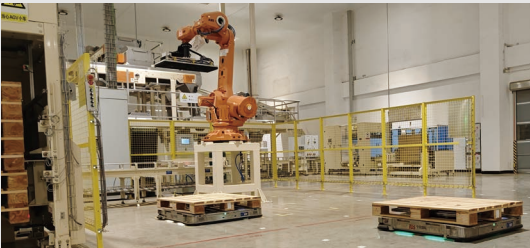
Phase 2 of the APR Handling Project for Finished Products and Raw Materials at a Shenzhen Automotive Parts Manufacturer;
APR Handling Project for XAP (Electronic Group) Raw Materials and Finished Products

Pharmaceutical Industry



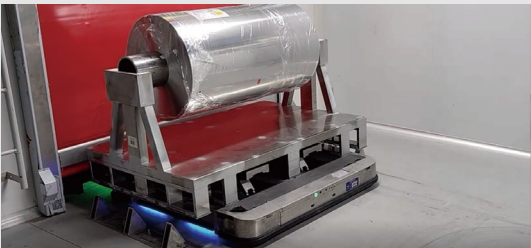
Intelligent APR Handling Project for Logistics in the Clean Area of a Pharmaceutical Limited Company;
APR Project for Intelligent Expandable Forklifts in a New Solid Dosage Workshop

Tobacco Industry



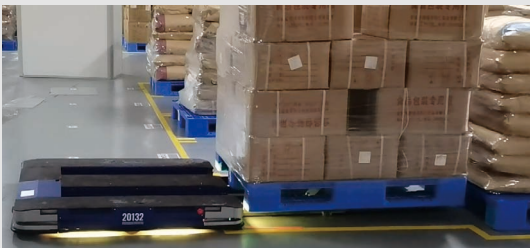
Automation Project for Discrete Material Handling in the Semi-Finished Tobacco Production at a Cigarette Factory;
APR Handling Project at a Central Tobacco Logistics Transfer Center

Electrical Vehicle



APR Project for Line-side Delivery of Aluminum Shells and Top Covers in a New Energy Company;
APR Project for Material Transfer at a Limited Company's Foil Materials Division

Food Industry



Cross-Floor Material Transfer Project for Raw Materials and Finished Products at a Food Company in Guizhou;
APR Handling Project for Semi-Finished Product Warehousing at a Limited Company in Fujian

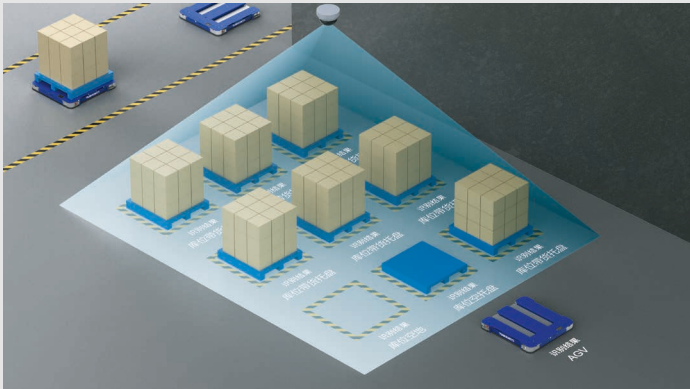
Home Appliance Industry



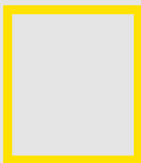
NB Packaging Line and Warehouse Material Distribution Project in Hefei;
APR Material Handling Project in a Environmental Systems Sub-factory in Foshan

Storage Location Visual Inspection System

The Storage Location Visual Inspection System uses deep learning image recognition to monitor storage locations in real-time. It updates information to the Tusk Intelligent Management Platform and optimizes robot deployment for factory operations accordingly.



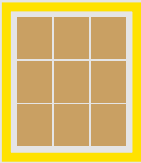
Recognizable Storage Location States



Unoccupied Ground without Pallets



Empty Pallets



Loaded Pallets

The Storage Location Visual Inspection System paired with the LEGO Task Configuration Module, offers flexible application for various business scenarios and task workflows. It enables automated triggering of pre-configured transport tasks like semi-finished product offloading, finished product offloading, raw material replenishment, empty pallet recycling, and empty pallet replenishment based on storage location status changes.



Cosmetics Industry



Logistics Industry



Furniture Industry



Printing Industry

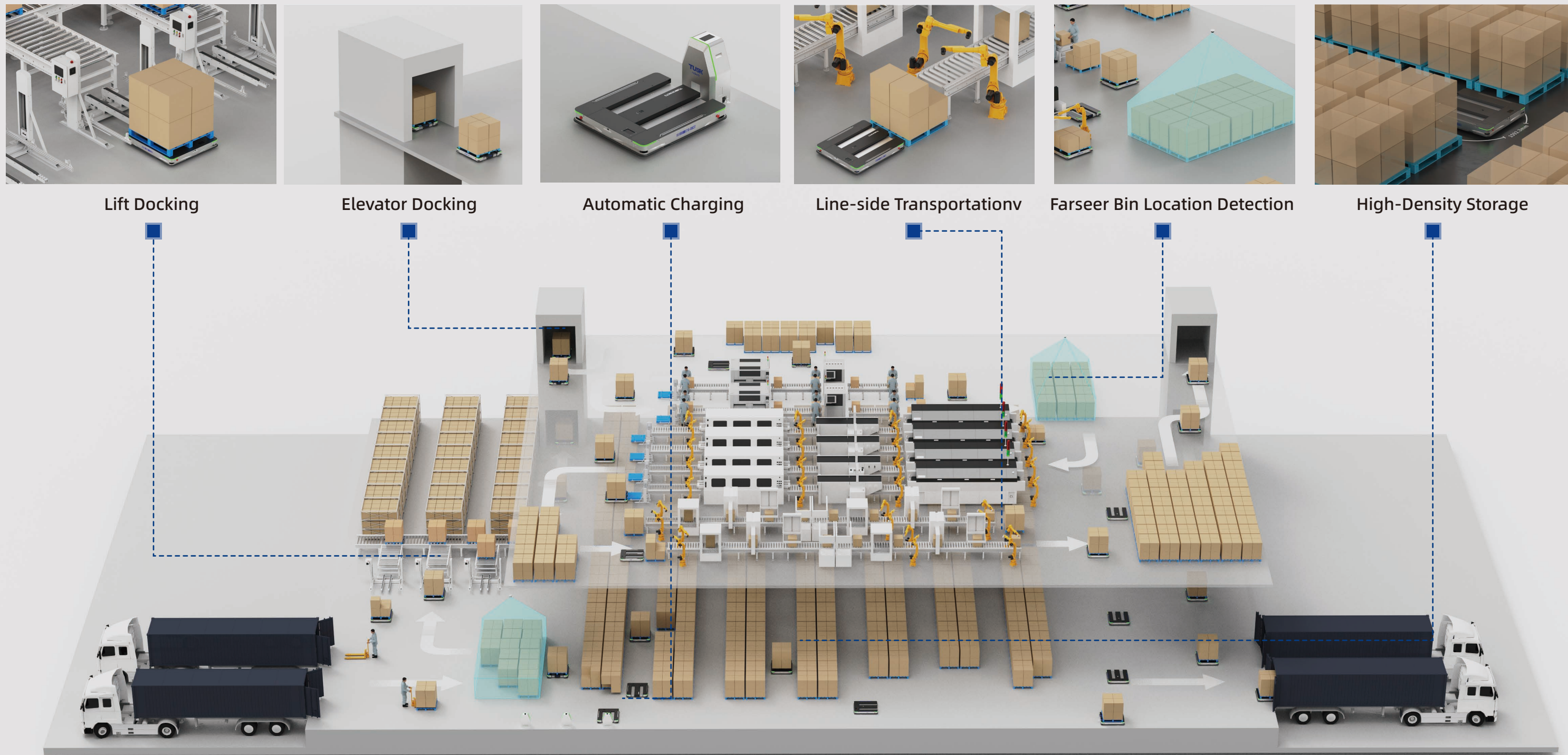


Electronics Components Industry



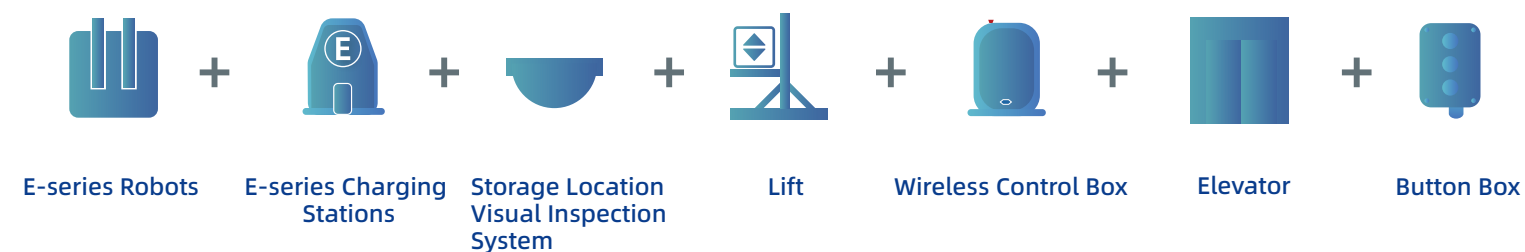
Automotive Parts Industry

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■ TUSK Creates Smart Factory Solutions

Based on TUSKROBOTS Autonomous Pallet-handling Robot and TUSK robot scheduling management system, in conjunction with factory automation production lines, MES, and WMS systems, the material flow paths of inbound and outbound docks, staging areas, production line areas, and semi-finished and finished goods storage areas are interconnected. This enables end-to-end traceability, control, and visualization, providing a comprehensive and integrated solution for intelligent factory logistics, covering production and inventory management.



Automotive Electronics Industry

APR Handling Project for XAP (Electronic Group) Raw Materials and Finished Products.

Industry Case Studies



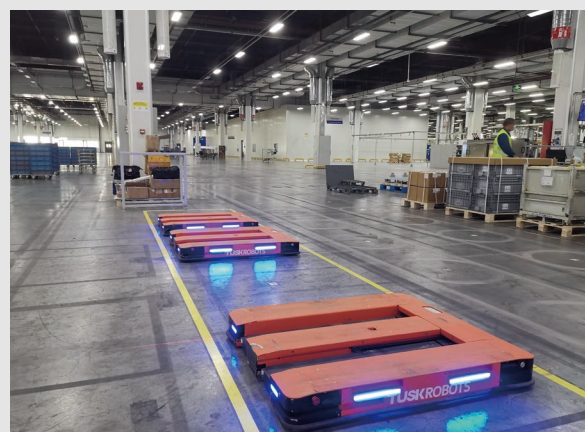
Client Profile

- **Leading global** automotive electronics company, a **Fortune Global 500** German corporation;
- Three-shift operation with strong workforce, but delayed manual material replenishment;
- Diverse carrier categories lacking process monitoring, resulting in high management costs.

Solution

- **Button call system** for seamless raw material replenishment and finished product transfer;
- **360° laser safety protection** with intelligent human-machine interaction for collision avoidance;
- Real-time integration with WMS/JIS digital systems for online monitoring through data fusion;
- Standardization of 16 pallet types down to **4**, reducing management costs;

Project Value



Pharmaceutical Industry

Intelligent APR Handling Project for Logistics in the Clean Area of a Pharmaceutical Limited Company

Industry Case Studies



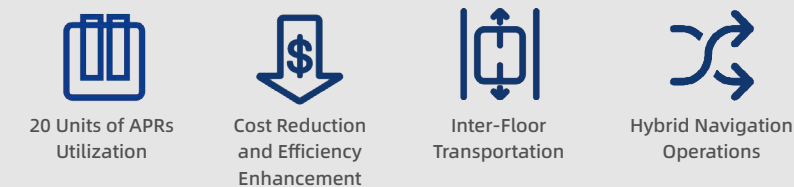
Client Profile

- A nationally recognized innovative enterprise engaged in the research, production, and global distribution of novel pharmaceuticals;
- Challenges include low manual labor efficiency in multi-floor, multi-zone warehouse transfers;
- Varied sterilization requirements across zones make manual aseptic handling **difficult to control**;

Solution

- Automatic distribution and transfer of packaging materials, raw materials, and finished products in **multiple zones**;
- Full automation with **elevator integration** for efficient multi-floor operations;
- SLAM + DM code **hybrid navigation** for adapting to various environmental requirements in different areas;
- Zone-based door control switching and **automatic disinfection and sterilization**;

Project Value



Home Appliance Industry

NB Packaging Line and Warehouse Material Distribution Project in Hefei

Industry Case Studies

Electrical Vehicle

APR Project for Line-side Delivery of Aluminum Shells and Top Covers in a New Energy Company

Industry Case Studies

Client Profile

- A famous enterprise in the home appliance manufacturing industry looking to establish an intelligent, lean **benchmark factory**;
- Operates 24/7 with high labor intensity, leading to fatigue issues;
- Facing high labor cost and recruitment challenges;
- Current inventory management lacks **material information integration**;

Solution

- Achieved automated material transfer within the workshop and at the production line side by integrating APR.
- APR automatically docks with **the hoister**, enabling cross-floor material transfer for production;
- **Customized business processes** integrated deeply with the customer's MES, enabling end-to-end automation and flexibility in production;

Project Value



More than 30% Efficiency Increase



Reduction of 15 Personnel



Cost reduction and increased efficiency



Flexible, efficient, and safe production



Client Profile

- A well-known domestic high-tech enterprise established in 1995, leading in multiple fields such as batteries, electronics, and automobiles;
- Working across multiple floors, long-distance transportation, resulting in high-intensity labor and **high safety risks**;
- **Low efficiency** in temporary storage management and material handling interactions;

Solution

- Pallet handling of foil and electrode materials for warehouse inventory, including cross-floor transportation, with **high-precision alignment** to elevators within $\pm 5\text{mm}$;
- Customized carriers equipped with automatic recognition capabilities, compatible with various equipment;
- Real-time integration with WMS for end-to-end visibility and control throughout the process;

Project Value



Over 80 Units of APRs Utilization



More than 35% Efficiency Increase



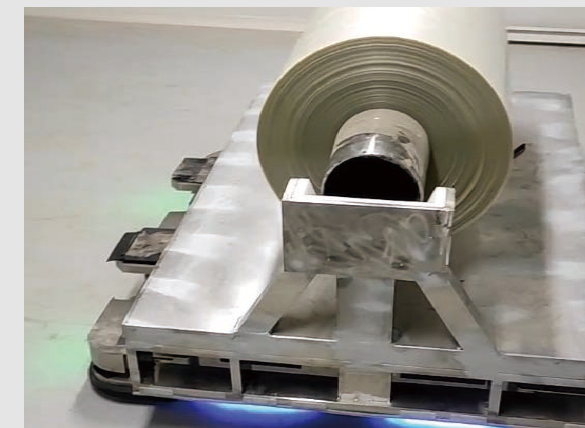
Multiple Project Launches Across Locations



Customized Carriers



Visualized Tracking



Food Industry

Cross-Floor Material Transfer Project for Raw Materials and Finished Products at a Food Company in Guizhou

Industry Case Studies

Tobacco Industry

Automation Project for Discrete Material Handling in the Semi-Finished Tobacco Production at a Cigarette Factory

Industry Case Studies

Client Profile

- Positioned as a high-quality chain bakery brand, occupying a modern industrial park of over 60,000m²;
- Chain-operated business with high production capacity and **stringent delivery schedule accuracy requirements**;
- Involves long-distance, cross-floor material handling, with a heavy reliance on manual labor that faces staffing instability;
- Complex passageways and transfer areas, with a high risk to personnel safety;

Solution

- PDA task instructions are issued promptly, ensuring seamless task execution;
- Efficient transportation with seamless transitions **across floors and diagonal warehouse** map locations;
- Utilizes 5G device communication for low latency and high stability;
- Employs SLAM+DM code **hybrid navigation** for highly adaptable environmental navigation;

Project Value



8 Units of APRs Utilization



Reduction of 6 Personnel



Increase in Inventory by Over 30%



Hybrid Navigation Operations



5G Communication



Client Profile

- Well-known tobacco industry corporation with 6 major cigarette production plants;
- Multiple on-site handling scenarios with long transportation distances, imposing significant manual labor;
- High-stacked goods pose substantial safety risks during handling;

Solution

- Automated Integration of **Robotic Arm** for Unpacking and Palletizing;
- **Double-Stacking** of Tobacco Bales in the Casing Box for **Enhanced Stability and Safety** during Transportation;
- **360° Laser** Safety Protection for Effective Hazard Elimination;
- Real-time Integration with WMS Digital System for Data Fusion and Online Monitoring;

Project Value



Over 20 Units of APRs Utilization



Reduction of 6 Personnel



Stable Operation for Over 1 Year



360° Laser Safety Protection



Precision Integration



Automotive Parts Industry

Advancing Automated Multi-Vehicle Collaboration in the Logistics of an Automotive Parts Enterprise

Industry Case Studies



Client Profile

- Established in 1972, a world-leading automotive technology manufacturer with a global sales presence;
- Significant safety hazards exist due to **the coexistence of numerous manual material handling equipment** in the workshop;
- Dependence on manual operations for goods in/out and transfers, leading to delayed response to demands;
- Complex working conditions, **diverse carriers**, and high difficulty in task allocation and vehicle scheduling;

Solution

- APR seamlessly **integrates with third-party equipment** for efficient transfers and automated outbound processes;
- Combining with the **C-series Submersible Lifting Robot** can ensure precise material distribution and automatic retrieval of empty carts;
- TUSK Visual Inspection System autonomously updates inventory statuses, enabling **human-machine collaboration** and one-click deliveries;

Project Value



30% Efficiency Improvement



Reduction of 30 Personnel



Precise and Efficient Human-Machine Interaction



Collaborative Operation of Different Types of Equipment



APR Creator Expert in Pallet Handling Scenarios

Product and Solution Consulting

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TUSKROBOTS



TUSKROBOTS

APR Creator



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