CORPORATE HQ & MANUFACTURER

Shenzhen Corporate HQ & Manufacturer

Building R, Shasi Dongbao Industrial Zone, Shajing Street, Baoan District, Shenzhen

Unmanned System Base

Zhihui Advanced Manufacturing Industrial Park, Huanzhen Road, Baoan District, Shenzhen, Guangdong

Xuzhou Manufacturer

S05 workshop, East of Anlan Avenue, Nokh of Linkong Avenue, Xuzhou Airpok Economic Development Zone, Juning County, Xuzhou City
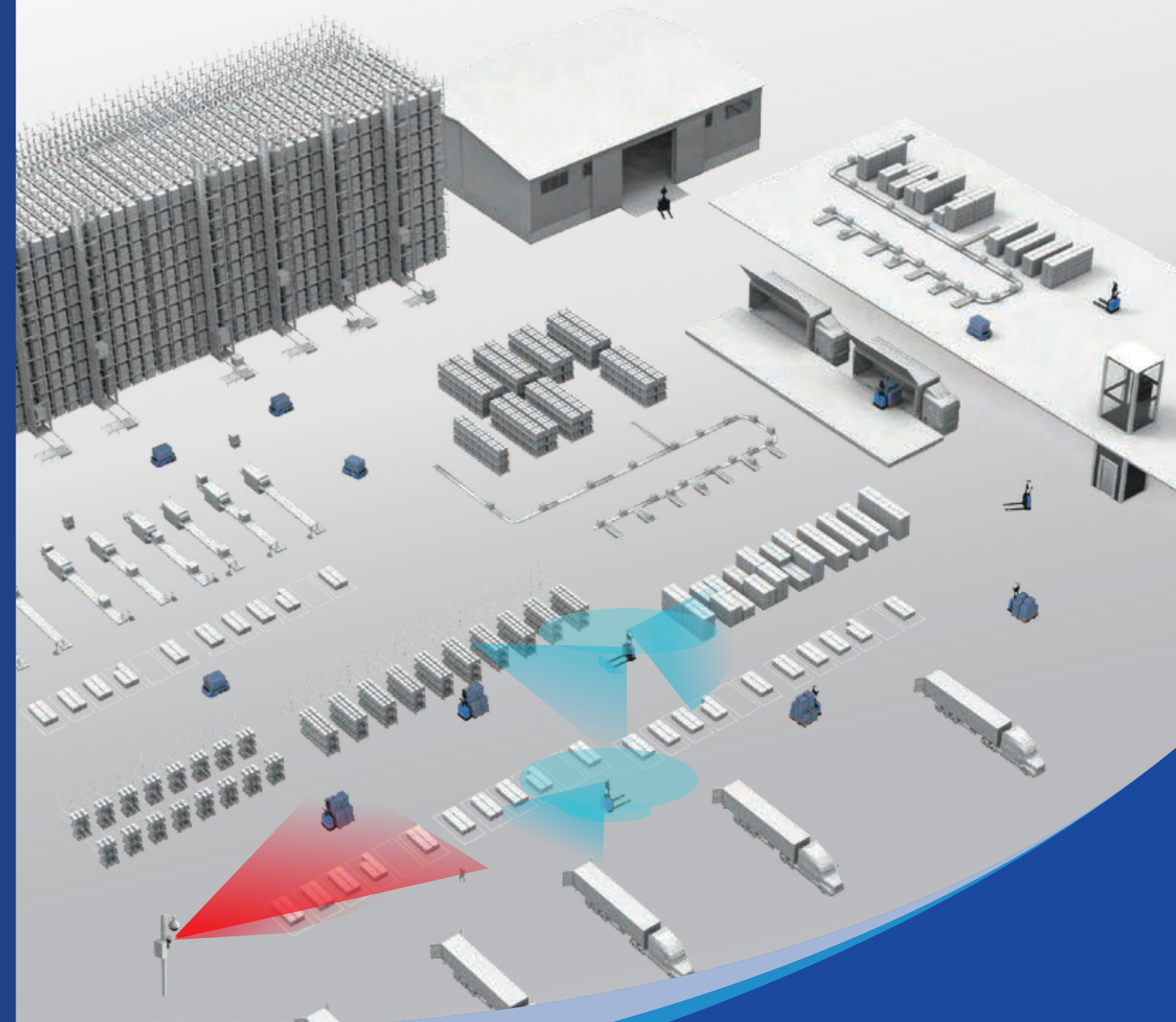
Jinan Manufacturer

Building A9, Intelligent Sensor Industrial Park, Licheng District, Jinan City, Shandong Province

Chongqing Manufacturer

2-1, Building 4, No. 16 Shigui Avenue, Jieshi Town, Banan District, Chongqing

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LSROBOT

Leishen Intelligent System Co., Ltd.

LiDAR 3D SLAM INTELLIGENT HANDLING ROBOTS SMART WAREHOUSING AND MANUFACTURING SOLUTIONS

Safe | Stable | Efficient | Flexible

EN-V2.4-24.10.18

CONTENTS

COMPANY INTRODUCTION

World-Leading 3D SLAM Intelligent Handling Robots Provider with Core LiDAR Sensor Technology

Founded in February 2015, Shenzhen Leishen Intelligent System Co., Ltd. (LSLiDAR) is the only company in its industry to win the National Science and Technology Progress Award (Second Prize) and is recognized as a national "Little Giant" enterprise. With strong independent R&D capabilities, LSLiDAR has become a global leader in mastering core LiDAR sensor technology for 3D SLAM intelligent handling robots.
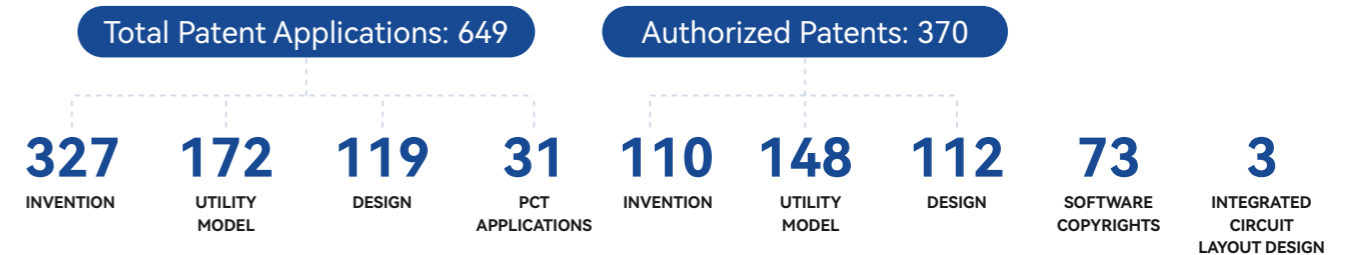
LSLiDAR focuses on the research and application of intelligent robot technology, creating world-leading 3D SLAM unmanned forklift/AMR system solutions suitable for automation in various manufacturing industries and logistics warehousing and transportation fields.

In the field of LiDAR, committed to the mission of "Traffic Safer, Work Smarter, Live Better", we have achieved comprehensive technical routes, full-field applications, and a fully localized layout, constructing a business ecosystem of 7 LiDAR product platforms, 3 algorithms, 2 controllers, and solutions across 10 industries, including autonomous driving, intelligent transportation, rail transit, general aviation, robotics, intelligent logistics, high-end security, ports, surveying and mapping, and industrial automation.

⬛ Set an Industry Milestone

- Created the world's first 3D SLAM unmanned forklift in 2019
- Led the drafting of the first industry group standard in 2024
- Developed the most comprehensive LiDAR product lineup on the market and achieved large-scale mass production

- Successfully overcame critical technological bottlenecks in LiDAR industry
- Released the world's first LiDAR 3D SLAM unmanned forklift/AMR domain controller
- The earliest LiDAR company to achieve 100% domestic production

⬛ Strong Patent Technology Accumulation

| Total Patent Applications: 649 | Authorized Patents: 370 |

327	172	119	31	110	148	112	73	3
INVENTION	UTILITY MODEL	DESIGN	PCT APPLICATIONS	INVENTION	UTILITY MODEL	DESIGN	SOFTWARE COPYRIGHTS	INTEGRATED CIRCUIT LAYOUT DESIGN

⬛ Global Expansion

With 4 major factories in Shenzhen, Xuzhou, Jinan, and Chongqing, and offices established in cities like Beijing, Tianjin, Hangzhou, Wuhan, Chengdu, and Xi'an, LSLiDAR has developed partnerships with over 20 overseas distributors. Our products are popular across China and are exported to more than 10 countries, including the U.S., Canada, Germany, France, the U.K., Japan, and South Korea.

Founder of LSLiDAR

Xiaobo Hu   Founder

Hu Xiaobo, founder of LSLiDAR, is currently the Chairman and CEO of Shenzhen LeiShen Intelligent System Co., Ltd (LSLiDAR). He is a participant in the China-Yale Leadership Program (Global Leadership Development Program), a senior AI engineer, and a well-respected expert in LiDAR, robotics, fiber lasers, and fiber optics. He is the founder of a major fiber laser company in China and the director of the Guangdong LiDAR Engineering Technology Research Center.

In 2014, he accompanied Premier Li Keqiang on a visit to the Russia Hundred Talents Forum as 1 of 10 representatives from China, leading and participating in over 10 national, provincial, and municipal science and technology projects. With over 20 years of experience in the industry, Hu Xiaobo has a significant influence and resource integration capability and is known as the "Father of Fiber Laser in China".

- 2020 National Science and Technology Progress Award (Second Prize)

- Shenzhen Science and Technology Progress Award (First Prize)

- Obtained 82 invention patents

- Shenzhen High-level Professional Talent (Local Level and Reserve Level)

- 2020 China Radar Industry Association Science and Technology Progress Award (Second Prize)

- Member of the 6th Shenzhen Bao'an District Committee of the Chinese People's Political Consultative Conference in 2021(as 1 of the 13 representatives of the scientific and technological field)

- 2022 "Innovation Star" of Guangdong Province enterprises

- Bao'an Master Craftsman

- National Technological Innovation in the Service Industry (First Prize)

- Talent of the 2023 Bao'an District Technology Innovation "Phoenix Talent Program" (Category A)

Honours

- Awarded the second prize of National Science and Technology Progress.

- Selected as the "Winning Unit of the New Generation Akificial Intelligence Industry Innovation Key Task" by the National Ministry of Industry and Information Technology.

- The National-level "Little Giant" company with characteristics of professionalism, refinement, distinctiveness and novelty.

- National High-tech Enterprise

- National Intellectual Property Advantage Enterprise

- Recognized as "Guangdong LiDAR Engineering Technology Research Centre" by the Guang- dong Provincial Depakment of Science and Technology.

- First Prize in the Shenzhen Science and Technology Progress Award

- Guangdong Province Manufacturing Single Champion Product

- Guangdong Province Famous High-Tech Product

■ Less Cost & More Efficiency

The 3D SLAM unmanned forklift enables 24/7 unmanned operations, helping businesses overcome challenges such as labor shortages, high labor costs, and difficulties in workforce management.

■ Low Comprehensive Cost

LSLiDAR products are highly cost-controlled. The 3D SLAM unmanned forklift can be equipped with up to 7 LiDAR sensors, yet the overall cost remains manageable. The investment cost is 69% lower compared to traditional forklifts.

Customer Value
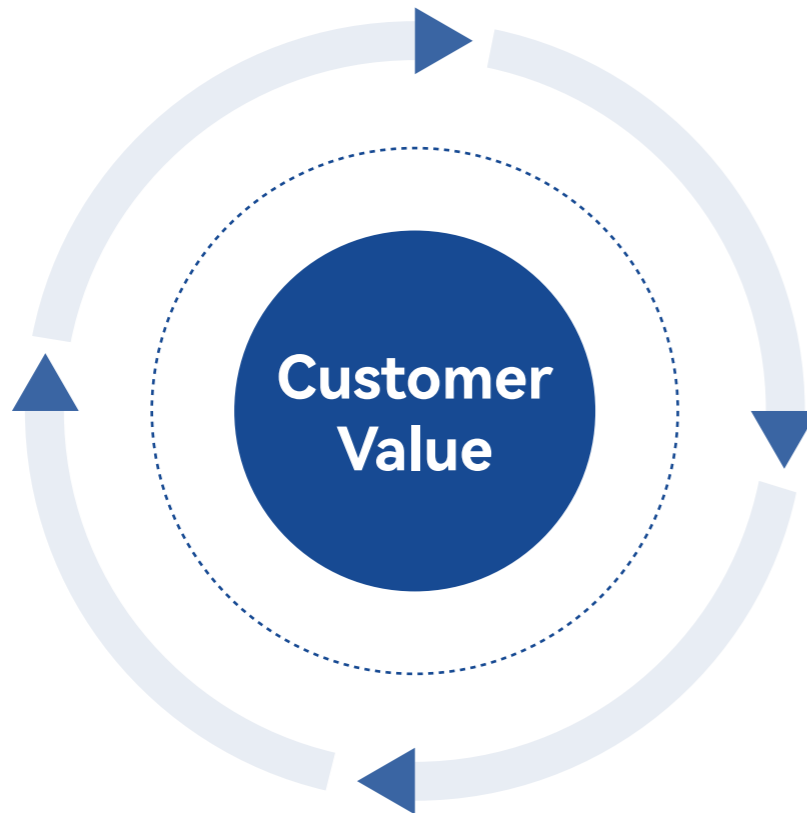
■ Fast Project Deployment

The 3D SLAM unmanned forklift requires no modifications to the operating environment and can be quickly deployed for production. Additionally, it is compatible with a self-developed and controllable software system, offering customized intelligent warehousing and unmanned manufacturing solutions, providing one-stop service to customers.

■ Professional Service

Unmanned forklift operation centers are established in key cities, serving as hubs to cover nationwide customers. The centers enable rapid response, offering integrated pre-sale, in-sale, and after-sale services.

■ Highly Safe

Equipped with 7 LiDAR sensors, the 3D SLAM unmanned forklift provides 360° all-around protection, eliminating blind spots and effectively preventing potential risks. This ensures operational safety and safeguards the user's business development.

PRODUCT ADVANTAGES

CH32R
3D Protection

M10
Fork Protection

C32W/M系列
Anti-collision

C16/C32
3D Protection Navigation & Obstacle Avoidance

CH128X1
Pallet Identification

LiDAR 3D SLAM Unmanned Forklift/AMR Domain Controller

IMU/Fiber Optic Inertial Navigation

Premium Configuration

The full range of intelligent unmanned forklifts is equipped with up to 7 high-precision LiDAR sensors.

3D Positioning and Navigation

Utilizing LiDAR 3D SLAM technology, the system creates high-precision 3D maps, enabling stable and reliable centimeter-level navigation and positioning.

3D All-Around Protection

With comprehensive, surround perception capabilities, the system provides 360° 3D safety protection, ensuring operational safety.

Strong Environmental Adaptability

Suitable for various complex indoor and outdoor environments, the forklifts ensure all-weather, all-scenario, fault-free operation.

Easy Deployment

No modifications to the operating environment are required, allowing for quick production deployment.

Autonomous and Controllable

Both the LiDAR sensors and the core algorithms, along with the supporting management software, are independently developed and fully controllable.

1 World-Leading LiDAR 3D SLAM Technology

Utilizing multi-line LiDAR as the core sensor for 3D scanning, this technology gathers rich environmental information without the need to modify the site environment or existing business processes. It enables high-precision 3D map construction, matching positioning, and path planning functions. The positioning is stable and adapts well to dynamically changing environments, making it suitable for various indoor and outdoor applications.

Accurate & Stable Real-Time 3D Point Cloud Mapping
Capable of constructing 3D point cloud maps for extremely large areas of over a million square meters, with rich environmental information and features.

Strong Environmental Adaptability
Suitable for various indoor and outdoor environments, unaffected by lighting conditions.

Easy Deployment & Quick Implementation
No auxiliary facilities are required for deployment; over 10 unmanned forklifts can be deployed within 1-2 weeks.

Low Investment Cost
Achieve automation, save labor costs and improve user profit margins.
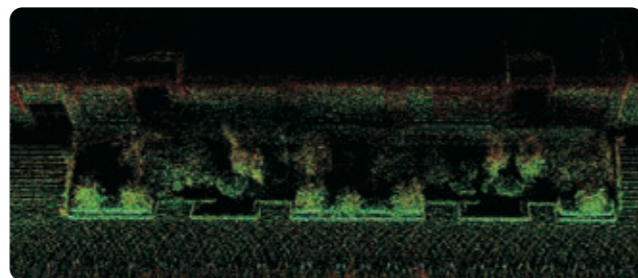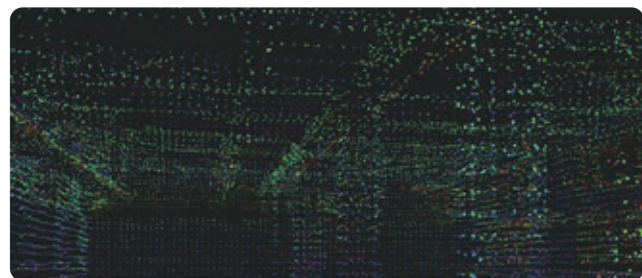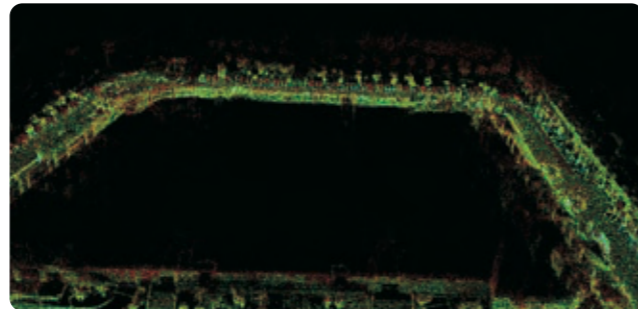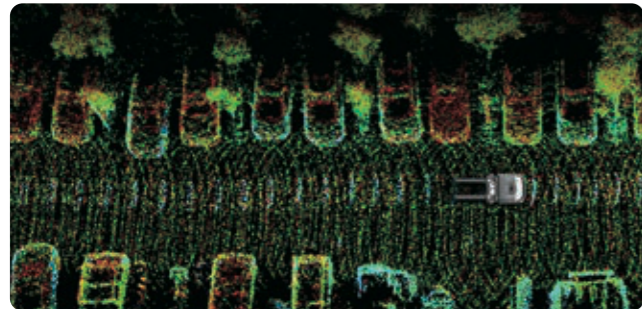
2 Comprehensive 3D Safety Protection

LiDAR sensors are installed on the top, middle, bottom, and fork tips of the vehicle, providing obstacle warning and avoidance detection at low, mid, and high positions around the vehicle. This creates a 360° blind-spot-free safety protection system, effectively warning and avoiding various sudden risks.

High Position Protection

Fork Tip Protection
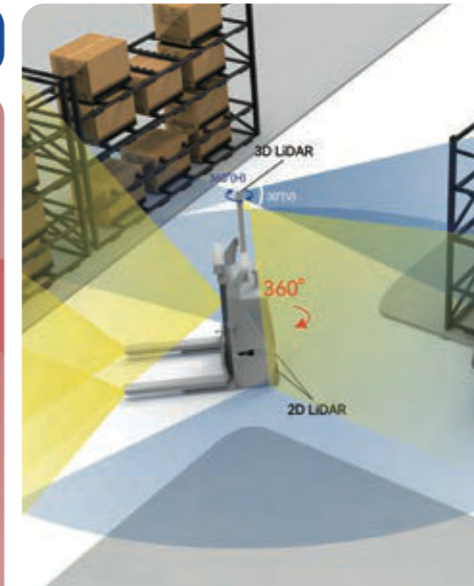
Blind Spot Protection

360° Protection
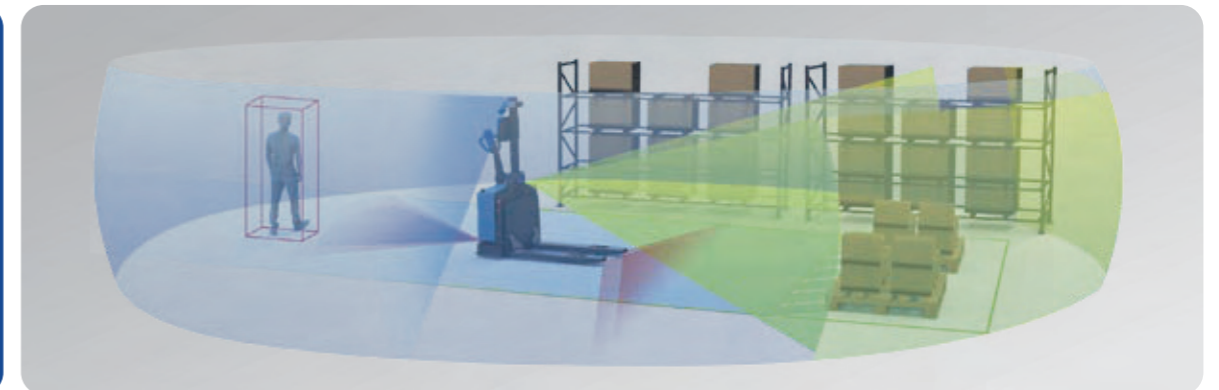
3 High-Precision Pallet Identification and Positioning

The 3D SLAM unmanned forklift accurately identifies pallets with millimeter-level precision using LSLiDAR's 128-line LiDAR. It is suitable for various indoor and outdoor scenarios, capable of accurately identifying pallets both day and night; ensuring fault-free operation in all weather and all environments.

Point Cloud Identification: In-house deep learning point cloud identification technology, automatically identify pallet positions.

Offset Tolerance: Supports manual pallet placement with up to 10 cm left/right and front/back offset, and allows for a 10° angular deviation.
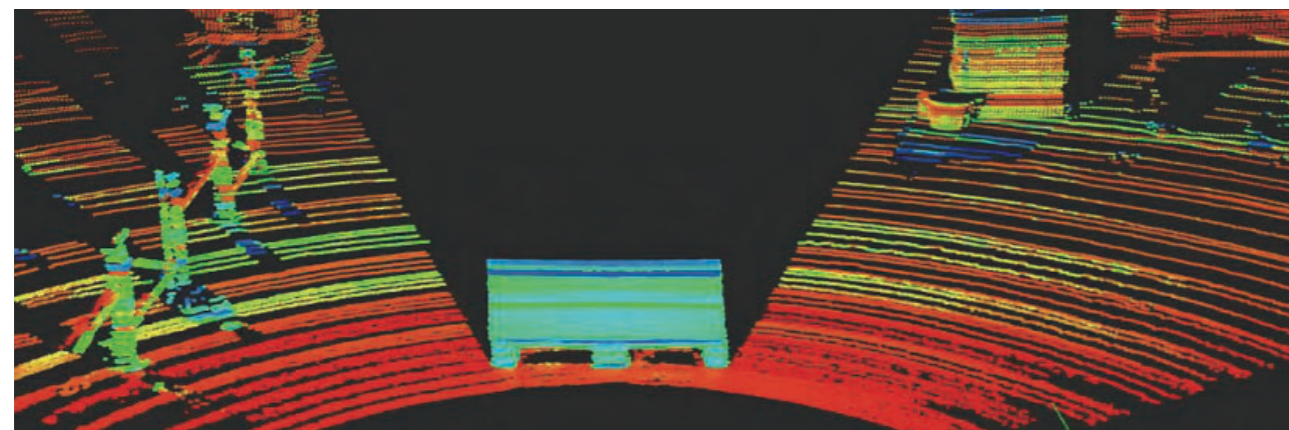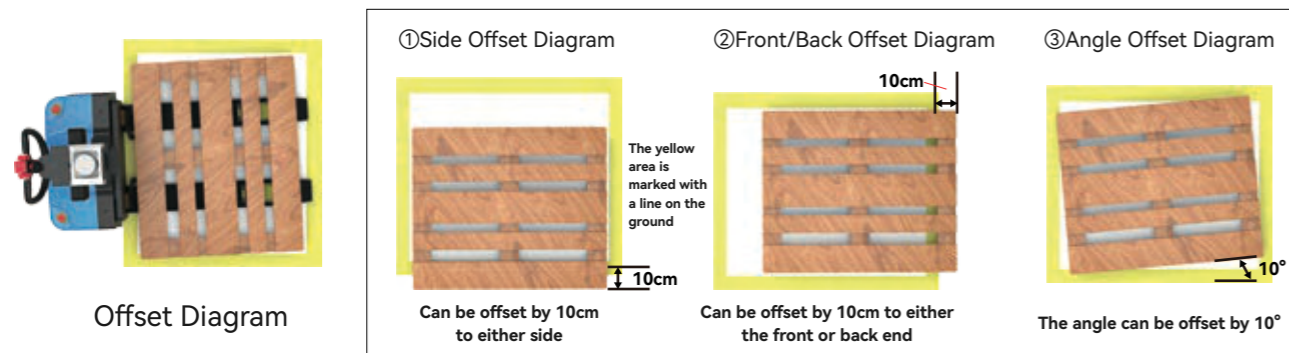
Accurate Proofreading: Effectively avoids the accumulated error of traditional technologies in picking up pallets at certain positions.

Offset Diagram

①Side Offset Diagram　②Front/Back Offset Diagram　③Angle Offset Diagram

The yellow area is marked with a line on the ground

10cm

10cm

10°

Can be offset by 10cm to either side

Can be offset by 10cm to either the front or back end

The angle can be offset by 10°

4 Intelligent Material Cage Stacking

The LSLiDAR 3D SLAM unmanned forklift is equipped with an advanced 128-line hybrid solid-state LiDAR, specifically designed to identify various types and sizes of material cages. Through precise feature extraction and pose calculation, combined with high-precision 3D SLAM positioning technology, the unmanned forklift autonomously navigates to the target location and accurately completes the stacking tasks. This not only improves operational efficiency but also ensures safety and stability throughout the entire process.

FUNCTIONS

Precise & Stable Multi-Layer High Stacking: The LSLiDAR 3D SLAM unmanned forklift offers precise sensing and positioning capabilities, supporting stacking up to 4 layers of material cages, ensuring accuracy and stability in the stacking process.

Indoor & Outdoor Versatility, 24/7 Operation: Equipped with a 128-line high-precision 3D LiDAR system, it is suitable for a variety of indoor and outdoor environments, allowing for stable and efficient operation day and night.

Ultra-High Local Control Precision: The stacking accuracy is extremely high, with an error margin controlled within 5 mm, ensuring precision in every stacking task.

Intelligent AI Anomaly Detection for Safety & Efficiency: Using AI-based anomaly detection algorithms, the system monitors the forklift's position and angle relative to the material cage in real time, making fine adjustments as needed. If unstable stacking is detected, the system immediately triggers safety mechanisms, guiding the forklift to recalibrate without needing to stop, ensuring efficient and safe operations.

Four-Layer Stacking

Anomaly Detection

3D SLAM Intelligent Handling Robots

LSLiDAR's intelligent unmanned handling equipment includes 6 major product series of 3D SLAM unmanned forklifts and Autonomous Mobile Robots (AMRs).

3D SLAM Lightweighted Pallet Truck
(LXST15-D)

3D SLAM Indoor Pallet Truck
(LXST20-D)

3D SLAM Narrow Aisle Pallet Stacker
(LXSL14-B)

3D SLAM Pallet Stacker
(LXL20-B)

3D SLAM Indoor Counterbalanced
(LXP15 / 20-B)

3D SLAM Outdoor Counterbalanced
(LXE15-B)

3D SLAM Outdoor Counterbalanced
(LXE20-B)

3D SLAM Outdoor Counterbalanced
(LXE20-H)

3D SLAM Reach Type Pallet Truck
(LXR15-B)

3D SLAM Stand-on Reach Type
(LXMR15-B)

3D SLAM Sit-down Reach Type
(LXMRZ25-B)

3D SLAM Tri-Lateral Pallet Truck
(LXK12-B)

3D SLAM Mobile Robot
(LXAMR-J600 / J1000)

LXST15-D

3D SLAM Lightweighted Pallet Truck

Autonomous Handling, Automatic/Manual Mode Switching

Application

| Production Line Transfer | Flat Warehouse Transfer |
| Cross-Floor Transfer | |

Parameter

Parameter	Value	Parameter	Value
Dimension (L*W*H)	1710*860*1985mm	**Voltage and Capacity**	48V / 50Ah
Weight (With Battery)	420kg	**Maximum Travel Speed** (Loaded / Unloaded)	4.68/5.4 km/h
Load	1.5T	**Walking Precision**	±20 mm
Lift	12cm	**Stopping Precision**	±10 mm
Turning Radius	1366mm	**Maximum Climbable Gradient** (Loaded / Unloaded)	4% / 6%
Fork Dimension (L*W*H)	1220*173*60mm	**Navigation Mode**	3D SLAM Natural Navigation
Charging Mode	Manual/Automatic	**Communication Mode**	WLAN/Suppoks 5G
Time to Full Charge	<1h	**Moving Function**	Forward/ Backward/Turn
Continuous Working Time after Full Charge	4-6h		

LXST20-D

3D SLAM Indoor Pallet Truck

Autonomous Handling, Automatic/Manual Mode Switching

Application

| Production Line Transfer | Flat Warehouse Transfer |
| Cross-Floor Transfer | |

Parameter

Dimension (L*W*H)	1710*850*1903mm	Voltage and Capacity	48V / 52Ah
Weight (With Battery)	480kg	Maximum Travel Speed (Loaded / Unloaded)	4.5/5.4 km/h
Load	2T	Walking Precision	±20 mm
Lift	12cm	Stopping Precision	±10 mm
Turning Radius	1335mm	Maximum Climbable Gradient (Loaded / Unloaded)	6% / 8%
Fork Dimension (L*W*H)	1220*173*60mm	Navigation Mode	3D SLAM Natural Navigation
Charging Mode	Manual/Automatic	Communication Mode	WLAN/Suppoks 5G
Time to Full Charge	<1h	Moving Function	Forward/Backward/Turn
Continuous Working Time after Full Charge	4–6h		

LXT20-D

3D SLAM Indoor Pallet Truck

Autonomous Handling, Automatic/Manual Mode Switching

Application

| Production Line Transfer | Flat Warehouse Transfer |
| Cross-Floor Transfer | |

Parameter

Dimension (L*W*H)	2135*935*1960mm	Voltage and Capacity	24V / 210Ah
Weight (With Battery)	830kg	Maximum Travel Speed (Loaded / Unloaded)	7.2/7.2 km/h
Load	2T	Walking Precision	±20 mm
Lift	12cm	Stopping Precision	±10 mm
Turning Radius	1824mm	Maximum Climbable Gradient (Loaded / Unloaded)	6% / 10%
Fork Dimension (L*W*H)	1220*173*60mm	Navigation Mode	3D SLAM Natural Navigation
Charging Mode	Manual/Automatic	Communication Mode	WLAN/Suppoks 5G
Time to Full Charge	<2h	Moving Function	Forward/Backward/Turn
Continuous Working Time after Full Charge	5–8h		

LXSL14-B

3D SLAM Narrow Aisle Pallet Stacker

Autonomous Handling, Intelligent
Stacking, Automatic/Manual Mode Switching

Application

| Production Line Transfer | Flat Warehouse Transfer |
| Cross-Floor Transfer | Drive-In Warehouse Operations |

Parameter

Parameter	Value	Parameter	Value
Dimension (L*W*H)	1755*950*2025mm	Voltage and Capacity	24V /210Ah
Weight (With Battery)	950kg	Maximum Travel Speed (Loaded / Unloaded)	3.6 / 3.6 km/h
Load	1.4T	Walking Precision	±20 mm
Lift	1600mm	Stopping Precision	±10 mm
Turning Radius	1150mm	Maximum Climbable Gradient (Loaded / Unloaded)	5% / 5%
Fork Dimension (L*W*H)	1150*180*60mm	Navigation Mode	3D SLAM Natural Navigation
Charging Mode	Manual/Automatic	Communication Mode	WLAN/Suppoks 5G
Time to Full Charge	<2h	Moving Function	Forward/Backward/Turn
Continuous Working Time after Full Charge	5-8h		

LXL20-B

3D SLAM Pallet Stacker

Autonomous Handling, Intelligent
Stacking, Automatic/Manual Mode Switching

Application

| Production Line Transfer | Flat Warehouse Transfer |
| Cross-Floor Transfer | Drive-In Warehouse Operations |

Parameter

Parameter	Value	Parameter	Value
Dimension (L*W*H)	2240*960*2303mm	Voltage and Capacity	24V / 200Ah
Weight (With Battery)	1630kg	Maximum Travel Speed (Loaded / Unloaded)	5 / 6 km/h
Load	2T	Walking Precision	±20 mm
Lift	4500mm	Stopping Precision	±10 mm
Turning Radius	1735mm	Maximum Climbable Gradient (Loaded / Unloaded)	6% / 8%
Fork Dimension (L*W*H)	1150*220*60mm	Navigation Mode	3D SLAM Natural Navigation
Charging Mode	Manual/Automatic	Communication Mode	WLAN/Suppoks 5G
Time to Full Charge	<2h	Moving Function	Forward/Backward/Turn
Continuous Working Time after Full Charge	5-8h		

LXP15/20-B

3D SLAM Indoor Counterbalanced

Autonomous Handling, Intelligent Stacking, Automatic/Manual Mode Switching

Application

Production Line Transfer	Flat Warehouse Transfer
Clamp-Style Customization	Automatic Loading / Unloading at Docks

Automatic Loading / Unloading for Wing Type Trucks

Parameter

Dimension (L*W*H)	2565*1034*2222mm(LXP15-B)	**Continuous Working Time after Full Charge**	5-8h
	3013*1034*2240mm(LXP20-B)	**Voltage and Capacity**	24V / 300Ah
Weight (With Battery)	2780 / 3300kg	**Maximum Travel Speed** (Loaded / Unloaded)	5.0 / 5.4 km/h
Load	1.5 / 2T	**Walking Precision**	±20 mm
Lift	3000mm	**Stopping Precision**	±10 mm
Turning Radius	1423 / 1852mm	**Maximum Climbable Gradient** (Loaded / Unloaded)	5% / 5%
Fork Dimension (L*W*H)	1085*134*40mm	**Navigation Mode**	3D SLAM Natural Navigation
Charging Mode	Manual/Automatic	**Communication Mode**	WLAN/Suppoks 5G
Time to Full Charge	<2h	**Moving Function**	Forward/ Backward/Turn

LXE15-B

3D SLAM Outdoor Counterbalanced

Autonomous Handling, Intelligent Loading and Stacking, Automatic/Manual Mode Switching

Application

Production Line Transfer	Material Cage Stacking
Clamp-Style Customization	Automatic Loading / Unloading at Docks

Automatic Loading / Unloading for Wing Type Trucks

Outdoor Operations

Parameter

Dimension (L*W*H)	2500*1225*2342mm	**Voltage and Capacity**	24V / 300Ah
Weight (With Battery)	2335kg	**Maximum Travel Speed** (Loaded / Unloaded)	6.0 / 7.0 km/h
Load	1.5T	**Walking Precision**	±20 mm
Lift	3000mm	**Stopping Precision**	±10 mm
Turning Radius	1325mm	**Maximum Climbable Gradient** (Loaded / Unloaded)	8% / 10%
Fork Dimension (L*W*H)	920*100*35mm	**Navigation Mode**	3D SLAM Natural Navigation
Charging Mode	Manual/Automatic	**Communication Mode**	WLAN/Suppoks 5G
Time to Full Charge	<2h	**Moving Function**	Forward/ Backward/Turn
Continuous Working Time after Full Charge	5-8h		

LXE20-B

3D SLAM Outdoor Counterbalanced

Autonomous Handling, Intelligent Loading and Stacking, Automatic/Manual Mode Switching

Application

Production Line Transfer	Material Cage Stacking
Clamp-Style Customization	Automatic Loading / Unloading at Docks
Automatic Loading / Unloading for Wing Type Trucks	
Outdoor Operations	

Parameter

Dimension (L*W*H)	3365*1325*2800mm	Voltage and Capacity	48V / 300Ah
Weight（With Battery)	3665kg	Maximum Travel Speed (Loaded / Unloaded)	7.0 / 8.0 km/h
Load	2T	Walking Precision	±20 mm
Lift	3300mm	Stopping Precision	±10 mm
Turning Radius	1825mm	Maximum Climbable Gradient (Loaded / Unloaded)	15% / 15%
Fork Dimension (L*W*H)	1070*122*40mm	Navigation Mode	3D SLAM Natural Navigation
Charging Mode	Manual/Automatic	Communication Mode	WLAN/Suppoks 5G
Time to Full Charge	<2h	Moving Function	Forward/ Backward/Turn
Continuous Working Time after Full Charge	5-8h		

LXE20-H

3D SLAM Outdoor Counterbalanced

Autonomous Handling, High Position Intelligent Stacking, Automatic/Manual Mode Switching, Waterproof

Application

Production Line Transfer	Material Cage Stacking
Clamp-Style Customization	Automatic Loading / Unloading at Docks
Automatic Loading / Unloading for Wing Type Trucks	
Outdoor Operations	

Parameter

Dimension (L*W*H)	3480*1219*2400mm	Voltage and Capacity	48V / 300Ah
Weight（With Battery)	3685kg	Maximum Travel Speed (Loaded / Unloaded)	16 / 16 km/h
Load	2T	Walking Precision	±20 mm
Lift	3300mm	Stopping Precision	±10 mm
Turning Radius	1793mm	Maximum Climbable Gradient (Loaded / Unloaded)	20% / 20%
Fork Dimension (L*W*H)	1250*122*40mm	Navigation Mode	3D SLAM Natural Navigation
Charging Mode	Manual/Automatic	Communication Mode	WLAN/Suppoks 5G
Time to Full Charge	<2h	Moving Function	Forward/ Backward/Turn
Continuous Working Time after Full Charge	5-8h		

LXR15-B

3D SLAM
Reach Type Pallet Truck

Autonomous Handling, High Position Intelligent Stacking, Automatic/Manual Mode Switching

Application

Warehouse Storage and Retrieval	Vertical Storage and Retrieval
Production Line Transfer	Material Cage Stacking
Drive-In Warehouse Operations	

Parameter

Dimension (L*W*H)	2474*1200*2637mm	Voltage and Capacity	24V / 210Ah
Load	1.5T	Maximum Travel Speed (Loaded / Unloaded)	5.5 / 6.0 km/h
Lift	3500mm	Walking Precision	±20 mm
Turning Radius	1900mm	Stopping Precision	±10 mm
Fork Dimension (L*W*H)	1070*122*40mm	Maximum Climbable Gradient (Loaded / Unloaded)	6% / 8%
Charging Mode	Manual/Automatic	Navigation Mode	3D SLAM Natural Navigation
Time to Full Charge	<2h	Communication Mode	WLAN/Suppoks 5G
Continuous Working Time after Full Charge	6–8h	Moving Function	Forward/Backward/Turn

LXMR15-B

3D SLAM
Stand-on Reach Type

Autonomous Handling, High Position Intelligent Stacking, Automatic/Manual Mode Switching

Application

Warehouse Storage and Retrieval	Vertical Storage and Retrieval
Production Line Transfer	Material Cage Stacking
Drive-In Warehouse Operations	

Parameter

Dimension (L*W*H)	2489*1244*2808mm	Voltage and Capacity	48V / 315Ah
Weight（With Battery）	2935kg	Maximum Travel Speed (Loaded / Unloaded)	9.0 / 10.0 km/h
Load	1.5T	Walking Precision	±20 mm
Lift	4500mm	Stopping Precision	±10 mm
Turning Radius	1839mm	Maximum Climbable Gradient (Loaded / Unloaded)	10% / 10%
Fork Dimension (L*W*H)	1070*100*35mm	Navigation Mode	3D SLAM Natural Navigation
Charging Mode	Manual/Automatic	Communication Mode	WLAN/Suppoks 5G
Time to Full Charge	<2h	Moving Function	Forward/Backward/Turn
Continuous Working Time after Full Charge	5–8h		

LXMRZ25-B

3D SLAM
Sit-down Reach Type

Autonomous Handling, High Position Intelligent
Stacking, Automatic/Manual Mode Switching

Application

Warehouse Storage and Retrieval	Vertical Storage and Retrieval
Production Line Transfer	Material Cage Stacking
Drive-In Warehouse Operations	

Parameter

Parameter	Value	Parameter	Value
Dimension (L*W*H)	2712*1464*2805mm	Voltage and Capacity	48V / 525Ah
Weight （With Battery）	5123kg	Maximum Travel Speed (Loaded / Unloaded)	8.5 / 10.0 km/h
Load	2.5T	Walking Precision	±20 mm
Lift	5500mm	Stopping Precision	±10 mm
Turning Radius	1987mm	Maximum Climbable Gradient (Loaded / Unloaded)	10% / 10%
Fork Dimension (L*W*H)	1070*125*45mm	Navigation Mode	3D SLAM Natural Navigation
Charging Mode	Manual/Automatic	Communication Mode	WLAN/Suppoks 5G
Time to Full Charge	<3h	Moving Function	Forward/ Backward/Turn
Continuous Working Time after Full Charge	5-8h		

LXK12-B

3D SLAM Tri-Lateral
Pallet Truck

Autonomous Handling, High Position Intelligent
Stacking, Tri-Lateral Forklifting, Automatic
/Manual Mode Switching

Application

Warehouse Storage and Retrieval	Vertical Storage and Retrieval
Production Line Transfer	

Parameter

Parameter	Value	Parameter	Value
Dimension (L*W*H)	3063*1560*2897mm	Voltage and Capacity	48V / 315Ah
Weight （With Battery）	5245kg	Maximum Travel Speed (Loaded / Unloaded)	7.5 / 8.0 km/h
Load	1.2T	Walking Precision	±20 mm
Lift	5000mm	Stopping Precision	±10 mm
Turning Radius	1910mm	Maximum Climbable Gradient (Loaded / Unloaded)	5% / 8%
Fork Dimension (L*W*H)	1250*125*50mm	Navigation Mode	3D SLAM Natural Navigation
Charging Mode	Manual/Automatic	Communication Mode	WLAN/Suppoks 5G
Time to Full Charge	<2h	Moving Function	Forward/ Backward/Turn
Continuous Working Time after Full Charge	5-8h		

LXAMR-J600/J1000

3D SLAM Mobile Robot

Autonomous Handling and Loading

Application
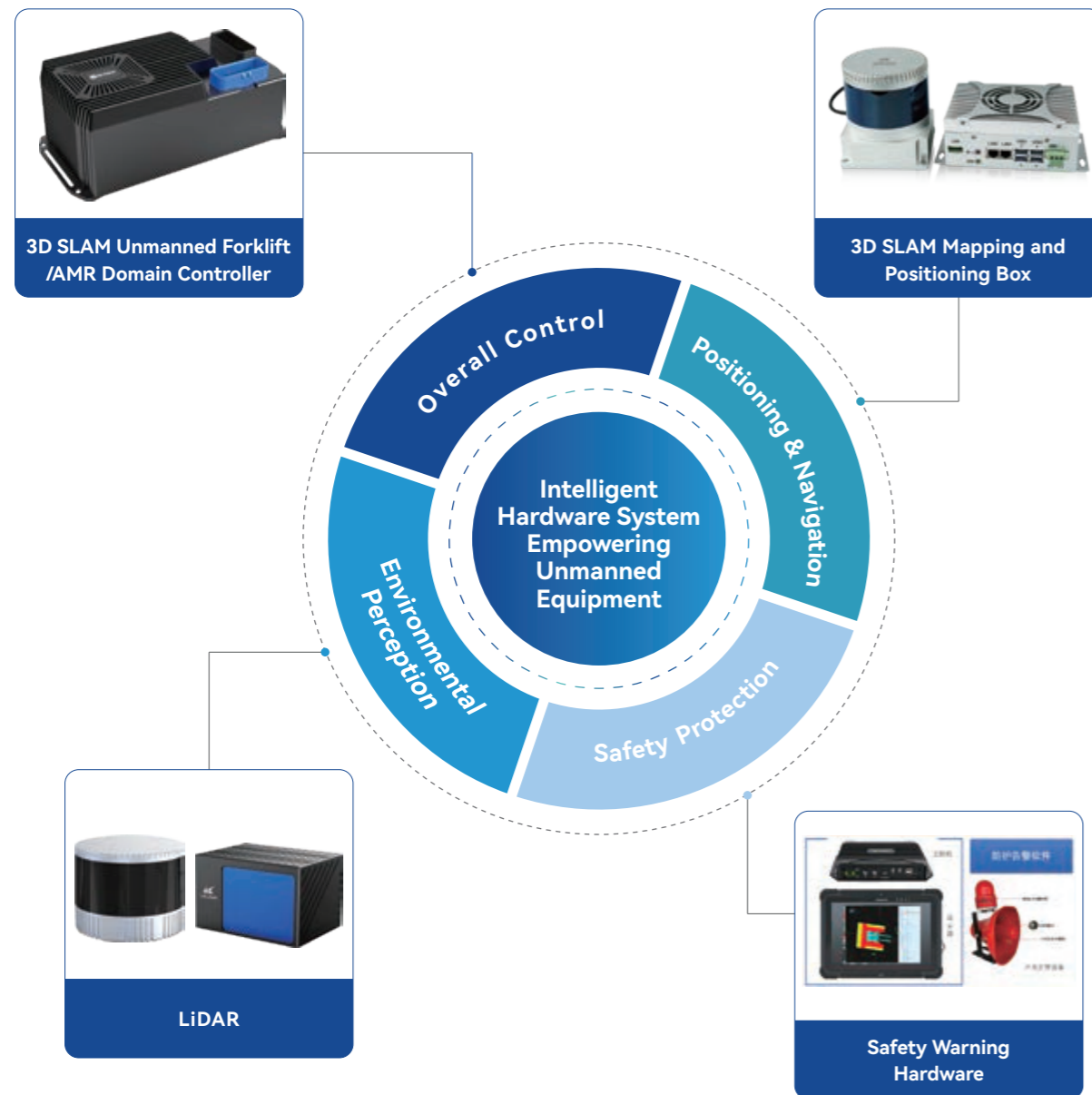
Cross-Floor Transfer	Production Line Transfer

Shelves-to-Person

Parameter

Parameter	Value	Parameter	Value
Dimension (L*W*H)	945*705*275mm (LXAMR-J600)	**Voltage and Capacity**	48V / 30Ah (LXAMR-J600)
	1045*745*280mm (LXAMR-J1000)		48V / 50Ah (LXAMR-J1000)
Weight (With Battery)	280 / 355kg	**Maximum Travel Speed** (Loaded / Unloaded)	1.2 / 1.5 m/s
Load	0.6 / 1T	**Walking Precision**	±20 mm
Lifting Height	55mm / 70mm (LXAMR-J1000)	**Stopping Precision**	±10 mm
Charging Mode	Manual/Automatic	**Navigation Mode**	3D SLAM Natural Navigation
Time to Full Charge	<1h	**Communication Mode**	WLAN/Suppoks 5G
Continuous Working Time after Full Charge	5-8h	**Moving Function**	Forward/Backward/Turn

CORE HARDWARE FOR INTELLIGENT HANDLING ROBOTS

LSLiDAR's intelligent hardware covers high-performance LiDAR, LiDAR positioning boxes, collision warning systems, and 3D SLAM unmanned forklift/AMR domain controllers. From perception, positioning and navigation, collision warning to overall vehicle control, these products comprehensively address the core functional needs of intelligent handling robots. They enable rapid integration for manufacturers of unmanned mobile devices or forklift OEMs, helping them quickly develop efficient, stable, and safe unmanned mobile equipment.

3D SLAM Unmanned Forklift /AMR Domain Controller

3D SLAM Mapping and Positioning Box

Overall Control

Positioning & Navigation

Intelligent Hardware System Empowering Unmanned Equipment

Environmental Perception

Safety Protection

LiDAR

Safety Warning Hardware

3D SLAM Unmanned Forklift/AMR Domain Controller

The domain controller is equipped with built-in 3D SLAM LiDAR navigation algorithms, motion control algorithms, pallet recognition algorithms, and 3D protection algorithms. It supports various forklift chassis models and vehicle types, providing professional solutions for forklift OEMs. This empowers forklifts to achieve the world's most advanced intelligent and unmanned upgrades, facilitating the quick and easy production of 3D SLAM unmanned forklifts/AMRs.

World's First

High-Precision True 3D SLAM Navigation

Utilizing world-leading multi-line LiDAR 3D SLAM technology, this system achieves centimeter-level precise positioning, building a large-scale 3D point cloud map of up to millions of square meters, and autonomously plans the optimal path.

Comprehensive 3D Protection

Supports multiple LiDAR models to enable 3D spatial perception, ensuring safety during operations.

Interfaces Adaptable to Various Needs

Equipped with abundant I/O resources and multiple communication interfaces, including 2 CAN channels, 2 RS485 channels, 4 RS323 channels, 4 USB 3.0 ports, 20 isolated digital inputs, 18 isolated digital outputs, and 4 wired network interfaces.

Robust Environmental Adaptability

Operates seamlessly across indoor and outdoor environments, day or night, unaffected by weather conditions, with anti-light interference capabilities.

Rapid Deployment, Easy Manufacturing

Featuring built-in mature software algorithms, it reduces R&D costs and supports fast vehicle development. Deployment is possible without additional positioning auxiliary devices, allowing for quick setup and easy maintenance.
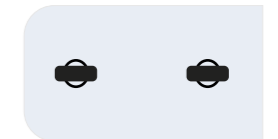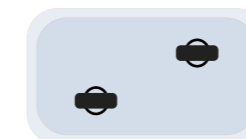
● Supports Various Chassis Models
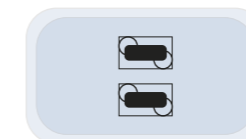
Dual-drive differential

Four-wheel drive differential

Dual steering wheels I

Dual steering wheels II

Four steering wheels

3D SLAM Mapping and Positing Kit

LX-3D SLAM Mapping and Positioning Kit is a core software and hardware product developed by LSLiDAR. With the 3D LiDAR as the main sensor, through the data fusion of LiDAR, IMU, odometer, GPS and other types of sensors, and together with high-performance proces- sors, it achieves the mapping and position matching of the operating environment. The product is also equipped with an Ethernet communication interface to meet the user's precise positioning needs in various operating scenarios.

|			
Hardware Configuration	IPC Platform	IPC Processor	Sensor data acquisition and processing, mapping and positioning computing power calculation
	LiDAR	C16	C16 Multi-line LiDAR with wide detection range and high performance (Can be adapted to other types of LiDAR)
	Supporting Positioning Sensor	IMU	Fusion Positioning Supporting
	Supporting Positioning Sensor	Odometer	Fusion Positioning Supporting (Optional)
	Supporting Positioning Sensor	GPS	Outdoor Fusion Positioning Supporting (Optional)
Product Function	Mapping		• Use C16 LiDAR to complete 3D scene map construction; • 3D mapping area reaches million-square-meter class (expansion of the industrial control processor memory to 32 G is needed); • The resolution of the map construction grid is 5 cm; • When the mobile obstacle accounts for no more than 10% of the map area, the map building function can be realized; • Forced closed-loop function based on global map information matching algorithm; • Global initialization function (risk: similar scene may cause positioning error).
	Positioning		• In indoor scenarios, the average positioning accuracy is within 3 cm, and the task-point positioning accuracy is within 1 cm; • In large outdoor scenes, the average positioning accuracy is within 5 cm, and the task-point positioning accuracy is within 3 cm; • Maintain stable positioning accuracy under the condition that the environmental change is no more than 30%.
Input & Output	Input		• LiDAR raw data, IMU attitude information and odometer auxiliary information (optional) and GPS information (Optional).
	Output		• Final output: Device Positioning Information (x,y,z,roll,pitch,yaw). • Intermediate process output: LiDAR point cloud information, matching score of point cloud, and updated pose after successful closed-loop And sensor connection status, etc.

3D LiDAR Collision Warning System

3D LiDAR forklift collision warning system utilizes LSLiDAR 3D LiDAR as the detection sensor, combined with 3D collision avoidance algorithm module, to achieve 3D scanning of the surrounding environment. It performs real-time obstacle detection and outputs warning signals
Suitable for various indoor and outdoor environments, enables accurate obstacle avoidance day and night, ensuring uninterrupted operation in all weather conditions and scenarios.

FUNCTIONS

Multi-level Security Alarm: 3D LiDAR Collision Warning System is equipped with a comprehen- sive multi-level safety alarm mechanism, ensuring the safety of personnel and equipment in the vicinity of the forklift.

Regional Division: Laser collision sensor is divided into three zones: protection zone, deceleration zone, and parking zone.

Safety Laser: By configuring LiDAR on the forklift, comprehensive and three-dimensional safety protection is achieved from all directions.

Customizable LiDAR Selection for Different Forklifts and Applications

LiDAR
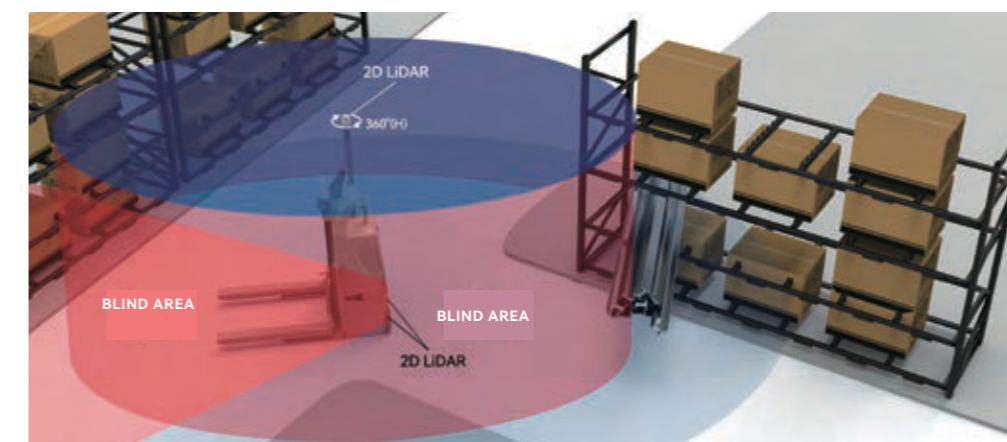
	CH128X1	CH32R	C32/C16	C32W	M10	CX128S2
	Hybrid Solid-state LiDAR	Ultra-wide Angle Blind Spot LiDAR	Multi-line Mechanical LiDAR	Wide FOV Mechanical LiDAR	Navigation & Obstacle Avoidance LiDAR	Hybrid Solid-state LiDAR
Function	Pallet Identification	3D Protection	Navigation & Obstacle Avoidance+3D Protection	3D Protection	Fork Protection Safety Protection	Fork Protection Safety Protection
Detection Range	200 m @70% 160 m @10%	30m @10% 120m @70%	100 m@10% 150 m@70%	60 m@10% 130m@70%	10 m@10% 25 m@70%	200 m@10%
Rangee Precision	±3 cm	±1 cm	±1 cm	±1 cm	±3 cm	±3 cm
FPS	5 / 10 / 20 Hz	5 / 10 / 20 Hz	5 /10 / 20 Hz	5 / 10 / 20 Hz	10 / 20 Hz	5 / 10 / 20 Hz
Horizontal(FOV)	120°	360°	360°	360°	360°	120°
Vertical(FOV)	25° (-18°~7°)	2.487°~89.105°	-16°~+15° / -16°~+14°	-54.7°~+15°	/	25° (-12.5°~12.5°)
Horizontal (Angular Resolution)	0.1° / 0.2° / 0.4°	0.09° / 0.18° / 0.36°	0.09° / 0.18° / 0.36°	0.09° / 0.18° / 0.36°	0.36°/0.72°	0.05°/0.1°/0.2°
Vertical (Angular Resolution)	0.125°@ROI 0.25°@Non ROI	Min 2.61°	Uniform 1° / Uniform 2°	Nonuniform Min 1.5°	/	0.125°@ROI 0.25°@Non ROI
Date Point Generating Rate (pts/sec)	76	64(Single Echo) 128(Dual Echo)	64(Single Echo) 128(Dual Echo) 32(Single Echo) 64(Dual Echo)	60	1	153
Operating Temperature	-40℃ ~ +85℃	-20℃ ~ +60℃	-20℃ ~ +60℃	-20℃ ~ +60℃	-20℃~50℃	-40℃~85℃
Storage Temperature	-40℃ ~ +105℃	-40℃ ~ +85℃	-40℃ ~ +85℃	-20℃ ~ +85℃	-30℃~70℃	-40℃~105℃
IP Grade	IP 6K9K	IP67	IP67	IP 67	IP65	IP6K9K
Dimensions (LxWxH / DxH)	118*90*75 mm	Φ100 mm*110 mm	Φ102 mm*77.9 mm	Φ102 mm*102 mm	Φ79.3*39 mm	139*112.78*47 mm
Weight	≈1 kg	1000g (Standard Type)	1040g (Standard Type)	≈1115 g	≈200 g	≤935 g

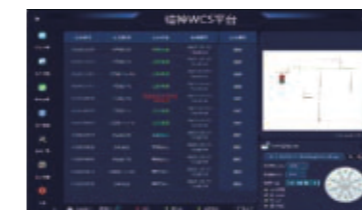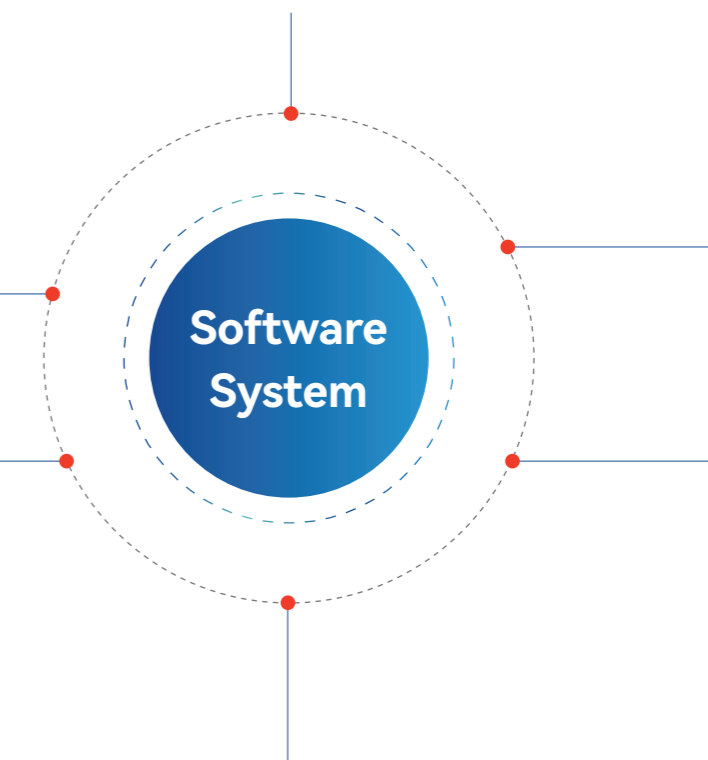# INTELLIGENT WAREHOUSING AND MANUFACTURING SOFTWARE SYSTEM
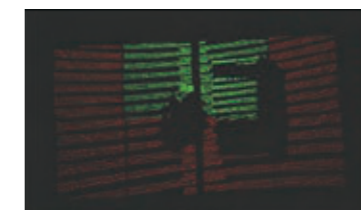
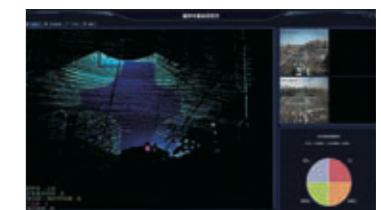FMS Intelligent Multi-Machine Scheduling System

AI Warehouse Monitoring System

WMS System

Software System

WCS System
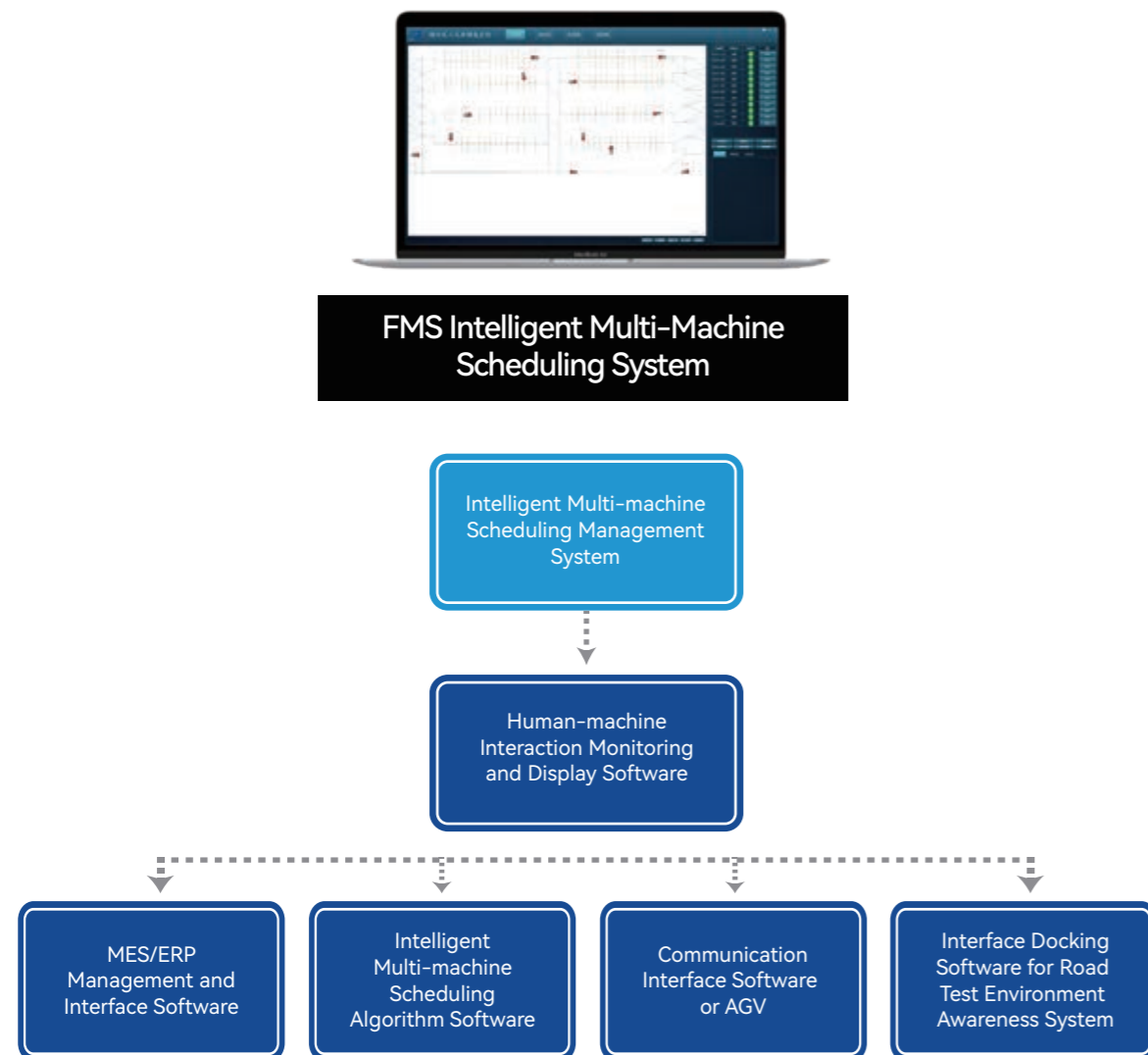
AI Storage Location Monitoring System

Intelligent Forklift Roadside Environment Sensing System

1 FMS Intelligent Multi-Machine Scheduling System

Based on the tasks issued by the ERP/MES as well as the operational status of the AGV in the scene and the scene map, the FMS formulates the tasks and navigation paths for the vehicles in the scene in real time. Based on the efficiency and time priority principle, the tasks and navigation paths of each AGV are optimally allocated.
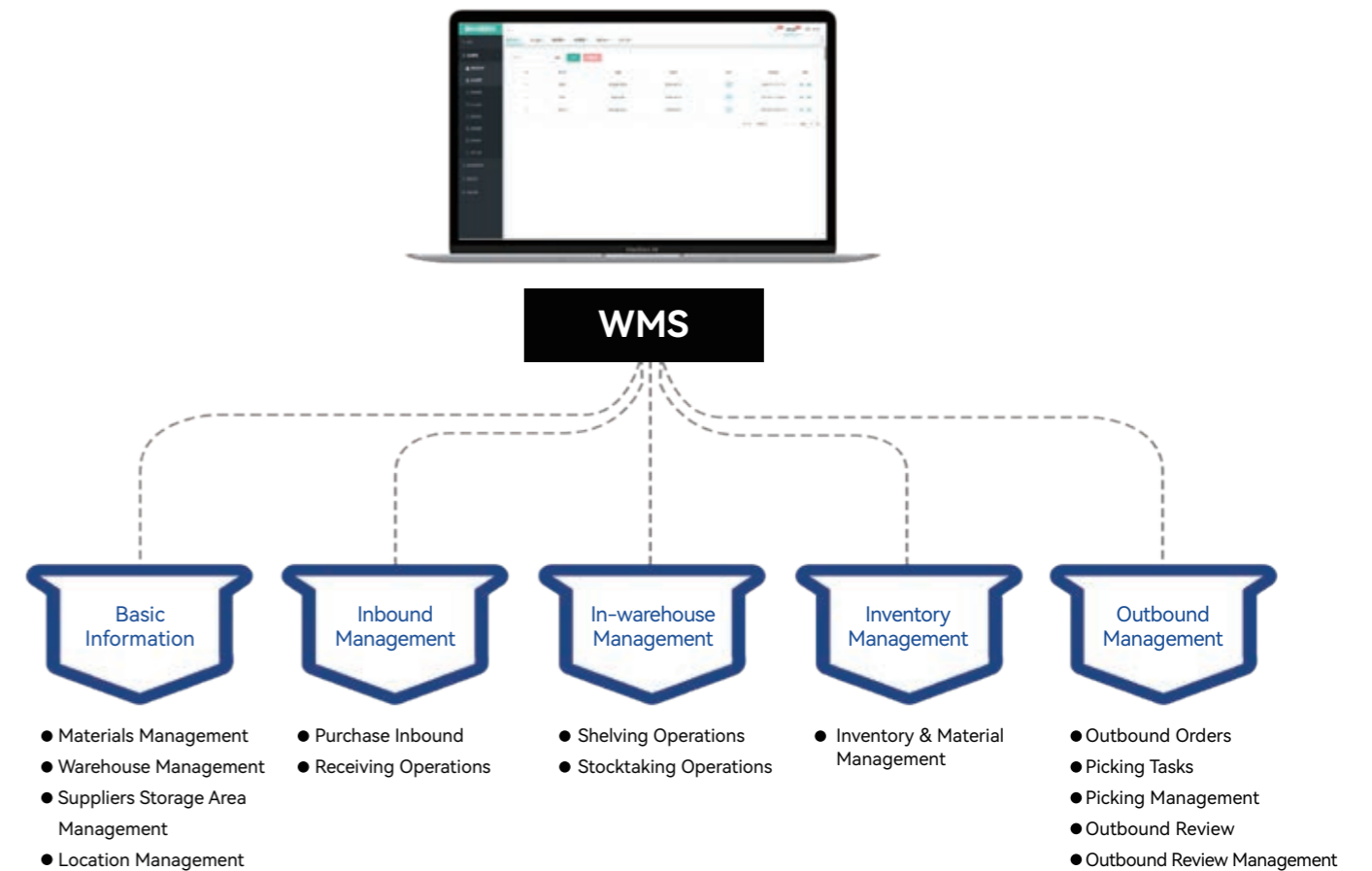
FUNCTIONS

FMS Intelligent Multi-Machine Scheduling System

Intelligent Multi-machine Scheduling Management System

Human-machine Interaction Monitoring and Display Software

MES/ERP Management and Interface Software

Intelligent Multi-machine Scheduling Algorithm Software

Communication Interface Software or AGV

Interface Docking Software for Road Test Environment Awareness System

2 One-Stop Warehouse Management WMS

The WMS is an integrated management system for material management, warehouse management, supplier management, stock management and instant inventory management through functions such as inbound operations, in-store inventory and outbound operations. It can effectively control and track the whole process of logistics and cost management of warehouse operations and achieve or improve the warehouse information management of enterprises.

FUNCTIONS

WMS

Basic Information
- Materials Management
- Warehouse Management
- Suppliers Storage Area Management
- Location Management

Inbound Management
- Purchase Inbound
- Receiving Operations

In-warehouse Management
- Shelving Operations
- Stocktaking Operations

Inventory Management
- Inventory & Material Management

Outbound Management
- Outbound Orders
- Picking Tasks
- Picking Management
- Outbound Review
- Outbound Review Management

3 AI Storage Location Monitoring System

LSLiDAR Warehouse Monitoring System provides comprehensive, real-time monitoring of all unmanned forklifts and AGVs operating within the warehouse. It displays the execution progress and details of various tasks in real time, while accurately reporting storage location usage and material inventory levels. By integrating and visualizing on-site data, the system enables users to clearly understand the overall warehouse operations, facilitating quick responses to and handling of any anomalies.

FUNCTIONS

Warehouse Monitoring System

Real-Time Monitoring

Monitors the operation of unmanned forklifts and AGVs in real time, graphically displaying execution status, battery levels, and other information.

Task Monitoring

Tracks details of both completed and pending tasks, compiling statistics on task execution and any anomalies.

Storage Statistics

Connects to warehouse storage locations, providing real-time statistics on space utilization, material types, and quantities.

System Logs

Records daily task execution, AGV operational status, and storage information in real time, generating daily reports and allowing access to detailed logs in the system's backend.

Interface Functions

Supports TCP/IP communication protocol, offering flexible device interfaces for integrating on-site operational data.

4 Full-Scene Automated Equipment Management WCS

The WCS is used to monitor the operational status of each hardware device on site, bind tasks to each hardware device, generate job tasks based on the device status and monitor and manage the task queue in real time.

WCS Warehouse In/Out Collaboration Process

Stock Monitoring/ Equipment (Status) → WCS System (Task Generation) → AGV Scheduling (Task Execution) → Goods in/out (Status) → WCS (Update Stock Status)

FUNCTIONS

WCS

Real-time Monitoring

Monitoring and graphically displaying the operation of the equipment, tracking the status of tasks and information about equipment operation, such as CNC finished machining and conveyor belt operation.

Task Management

Providing task scheduling functions, binding tasks according to application requirements and IO signals from CNC equipment and conveyor belts, and sending tasks to the scheduling system.

Interface Functions

Providing device interfaces for flexible management of field devices via TCP/IP communication protocols.

Abnormality Handling

Collecting equipment fault codes, storing equipment fault logs and issuing help messages for quick fault finding and troubleshooting.

System Log

Real-time recording of operating status and generating time-phased reports

5 AI Slot Monitoring System

LiDAR Monitoring : Based on deep learning, fast identification of locations, people and goods, real-time data sharing to WCS/WMS, real-time monitoring even without lighting.

Visual Monitoring : Based on deep learning, fast identification of locations, people and goods, real-time data sharing to the WCS/WMS.

FUNCTIONS

Camera Detection Effect

LiDAR Detection Effect

Visual Monitoring

LiDAR Monitoring

6 Intelligent Forklift Roadside Environment Sensing System
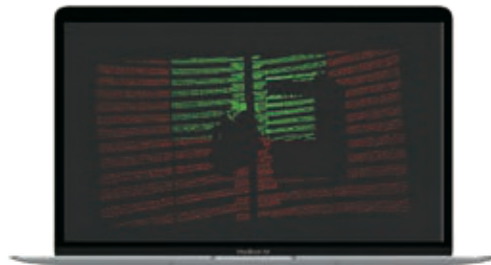
By accurately detecting and identifying forklifts, AGVs, motor vehicles and pedestrians in the detection area, the system obtains information on the position of the target and then broadcasts the effective road information to the FMS through transmission equipment. Then the FMS combines real-time roadside data with advanced traffic control algorithms to achieve advanced judgement and early warning of dangerous road conditions, which improves traffic efficiency and ensures the safe operation of intelligent forklifts.

FUNCTIONS

Accurate Detection: The function complementary of LiDAR and camera effectively improves the accuracy and reliability of data acquisition.

Full Road Coverage: Applicable to all kinds of complex road sections, achieving all-round and no- dead-end detection coverage.

Accurate Recognition of Target Attributes: After deep learning, the advanced neural network algorithm can accurately identify target attributes and output information such as type, orientation, distance, speed, movement direction and traffic flow of forklifts, AGVs, motor vehicles and pedestrians.

Event Information Judgment: It can directly judge and output "traffic congestion", " road spillage", "intrusion event", "parking ", "V2P and other event information".

Vehicle-Road Co-operation System Architecture

LiDAR Visual Recognition and Classification Effects

LSLiDAR + Camera

APPLICATION SCENARIOS

Unmanned loading and unloading of wing type trucks

Cross-floor transfer

Stacking of multi-layer material

Docking with drive-in shelving

Multi-vehicle coordination

Docking with roller conveyor line

Docking with automated storage

High position storage and retrieval

Docking with palletizing machine

Docking with unmanned logistics vehicles

Plant area vehicle-road coordination

Outdoor operations

Application Industries

Served over 300 industry clients, successfully achieving applications in various sectors, including 3C electronics, automotive, food, beverages, tobacco, petrochemicals, pharmaceuticals, leather, paper-making and etc.

300+
Industry Clients

- Automotive Electronics
- 3C Electronics
- Daily Chemicals
- Leather
- Food
- Textile
- Electrical Appliance Manufacturing
- Petrochemical
- Cold Chain Logistics
- Battery Swapping
- Packaging
- ······

Automotive Electronics

Battery Swapping

Cold Chain Logistics

Leather

Sugar

Electronic Components

Electrical Machinery Manufacturing

3C Electronics

Paper

Daily Chemicals

Electrical Appliance Manufacturing

Electronics

Strategic Partners

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ZTE中兴 | YUTONG | | SF EXPRESS 顺丰速运 | 中国汽研 CAERI | XCMG

LG | 中国移动 China Mobile | LiuGONG 柳工 | Vinda 维达 | EVS EV SOOSUNG | WAYTOUS 慧拓

HYUNDAI CONSTRUCTION EQUIPMENT | Makita | JABIL | Qualcomm | MINTH MINTH GROUP | GOSUNCN 高新兴

SANY | Panasonic | SHARP | JUNGHEINRICH | Genvict 金溢 | CLAAS

AGCO Your Agriculture Company | Kalman Navigation | 北斗 SLR | CRSC | Danfoss | NOVUS HI-TECH

ASI | brainc corp | JBT | viettel | WHEELTEC INTELLIGENT TECHNOLOGY | NEXCO 東日本

TATWEER | Sumitomo | OSHKOSH | VECNA robotics | Vermeer | Doog

SMVIC | GUIDE | IRay | OTIS | Wistron 緯創資通

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LSROBOT