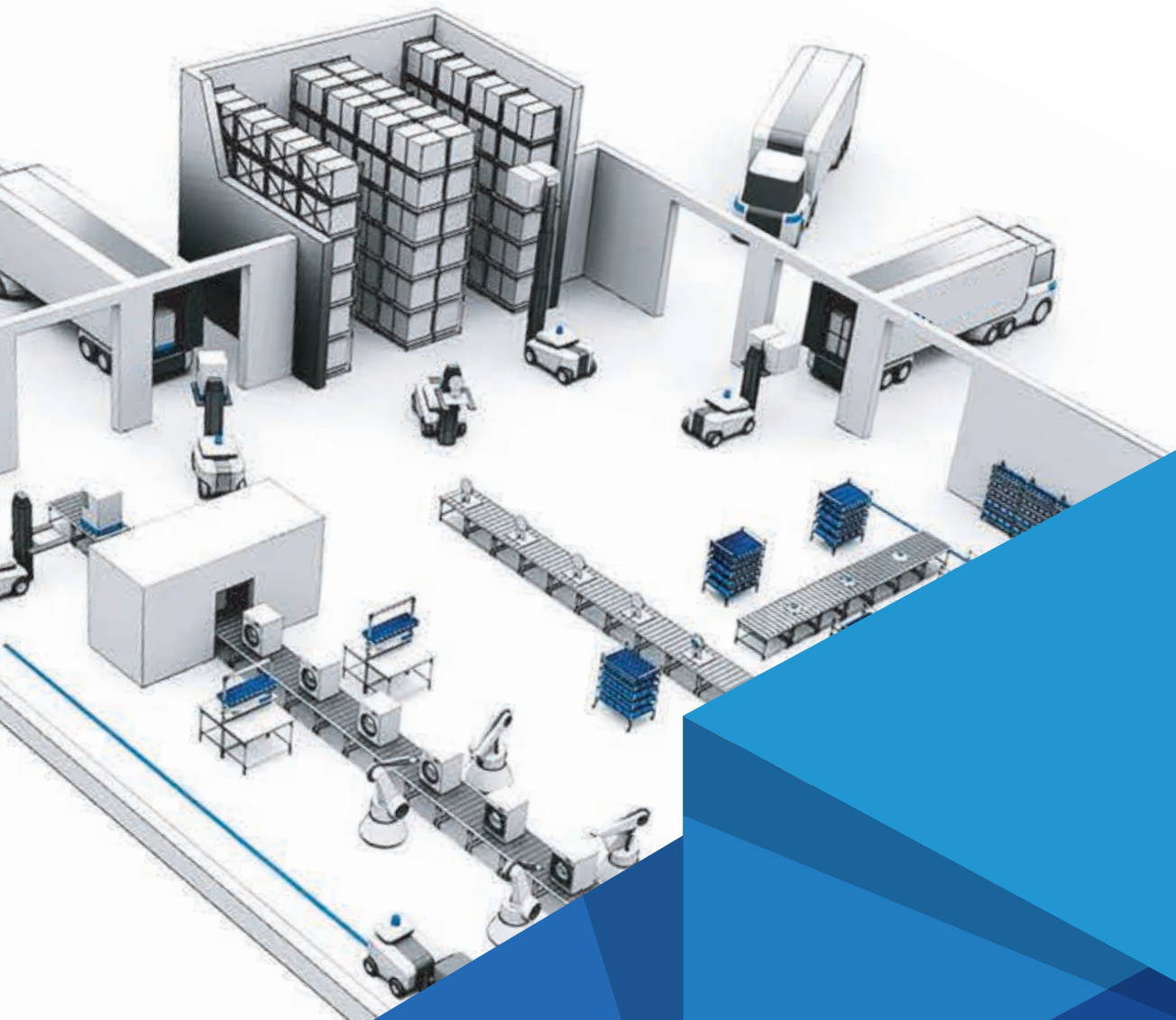
LiDAR 3D SLAM UNMANNED SMART WAREHOUSING AND MANUFACTURING SOLUTIONS



Safe | Stable | Efficient | Flexible

Contents

02 **About LiDAR**

Company Introduction 02
Application Areas 02
Honours 02

03 **Founder of LiDAR**

Introduction and Honors 03

04 **LiDAR 3D SLAM Unmanned Smart Warehousing and Manufacturing Solutions**

LiDAR 3D SLAM Unmanned Smart Warehousing and Manufacturing Solutions 05
LiDAR 3D SLAM Positioning & Navigation System 06
Software Systems 12

19 **LiDAR Industrial Robot Series**

Reach Type Pallet Truck	TR15-B	21
Reach Type Pallet Truck	TR20-B	22
Narrow Aisle Pallet Stacker	TRL14-B	23
Indoor Counterbalanced	TRP15-B	24
Indoor Counterbalanced	TRP20-B	25
Pallet Truck	TRST15-C	26
Pallet Truck	TRT15-D	27
Pallet Truck	TRT20-C	28
Outdoor Counterbalanced	TRE15-B	29
Outdoor Counterbalanced	TRE25-A	30
Outdoor Counterbalanced	TRE25-B	31
Outdoor Counterbalanced	TRE30-A	32
Outdoor Counterbalanced	LXE35-A	33
AMR	TR-C200	34
Automatic Tructor	TRT60-E	35
Automatic Tructor	TRT400-F	36

LiDAR 3D SLAM Unmanned Smart Warehousing and Manufacturing Solutions

Adaptation to WCS and WMS management, automatic pick-up of goods by AGV

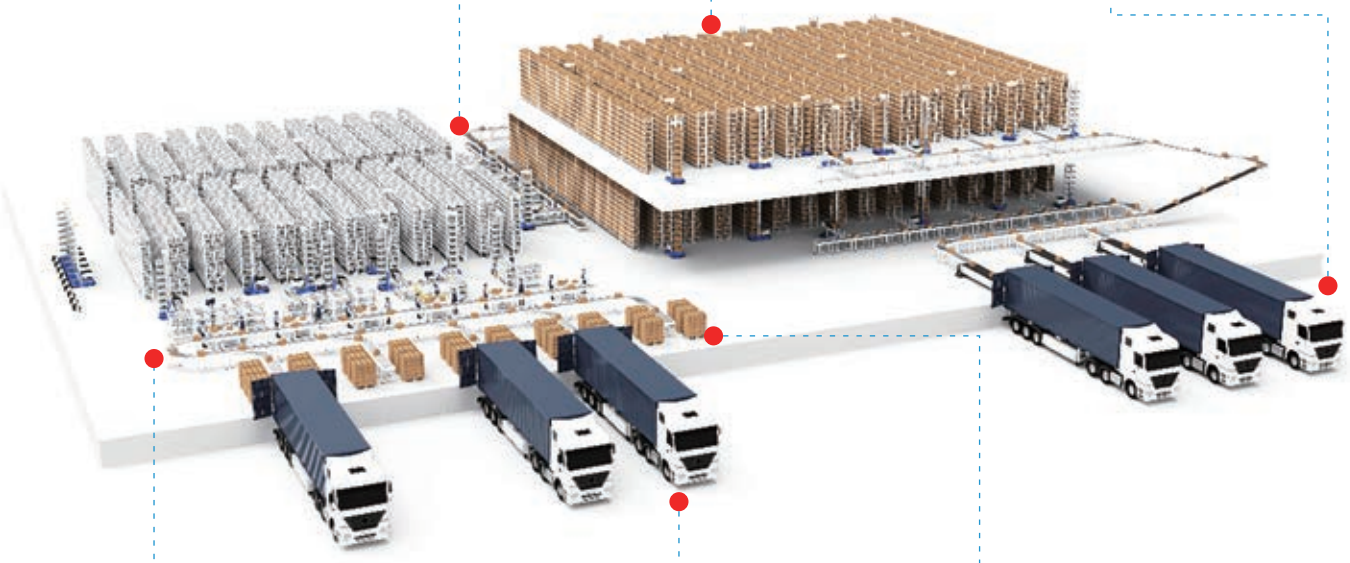


Online scheduling of unmanned handling equipment, automatic access to the warehouse



Intelligent warehouse monitoring and AGV handling







Sensor-based monitoring, intelligent transport on automated assembly lines



Based on Laser 3D SLAM Navigation, move the finished product to the delivery are



Automatic alignment of line goods to match manufacturing

LiDAR 3D SLAM Unmanned Smart Warehousing and Manufacturing Solutions

LiDAR 3D SLAM Positioning & Navigation Solution

- Positioning
- Perception
- Control
- Scheduling

Software Systems

- WMS
- WCS
- FMS Intelligent Multi-Machine Scheduling System
- Intelligent Forklift Roadside Environment Sensing System
- AI Environmental Monitoring System

LiDAR's Smart Unmanned Handling Equipment


Reach Type Pallet Truck


Narrow Aisle Pallet Stacker


Indoor Counterbalanced


Outdoor Counterbalanced


Pallet Truck


Outdoor Counterbalanced


Outdoor Counterbalanced


Outdoor Counterbalanced


Pallet Truck


Pallet Truck


AMR


Automatic Tractor


Automatic Tractor

LiDAR 3D SLAM Positioning & Navigation System



SYSTEM PARTS



FUNCTIONS

- Autonomous Positioning and Navigation
- Intelligent Pallet Identification and Positioning
- Sensor Integration and Motion Control
- Automatic Forking and Unloading
- Intelligent Multi-Machine Scheduling
- Multi-Safety Warning
- Power Monitoring and Automatic Recharging

ADVANTEGES

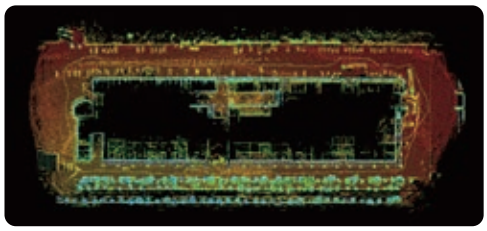
3D Protection

All-round 3D sensing capability for the ultimate in safety protection for AGV



All-round 3D Environment Perception

Equipped with multiple 3D multi-line LiDARs with superior performance, providing stable and rich 3D environment information for AGV, achieving all-round superb perception capability



Strong Environmental Adaptability

Suitable for various indoor and outdoor scenarios, accurate pallet identification and navigation to avoid obstacles both day and night, achieving all-weather and all-scene trouble-free operation



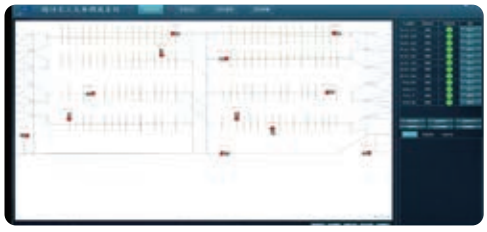
Strong Comprehensive Cost Control

With high stability, high reliability, high maintainability, high security and world-leading comprehensive cost advantage.



Integrated Management Software

The standard API interface is compatible with a wide range of system software, and supports WMS, WCS, FMS and intelligent location monitoring systems to assist in the management of unmanned operations



Convenient Deployment, Multiplying Efficiency

No need to deploy auxiliary facilities in the environment, short commissioning period; supporting 7*24 unmanned operations and intelligent multi-machine scheduling, significantly improving work efficiency.



LiDAR



CH128X1
Hybrid Solid-state LiDAR



CH32R
Ultra-wide Angle Blind Spot LiDAR



C32/C16
Multi-line Mechanical LiDAR



C32W
Multi-line Mechanical LiDAR



M10
Navigation & Obstacle Avoidance LIDAR



W Series
Navigation & Obstacle Avoidance LIDAR

Function	Pallet Identification	3D Protection	Navigation & Obstacle Avoidance+3D Protection	3D Protection	Fork Protection、Protection	Fork Protection、Protection
Detection Range	200 m @70% / 160 m @10%	40m @10% / 130m @70%	110 m@10% / 160m@70% 100 m@10% / 150 m@70%	55 m@10% / 125m@70%	10 m@10% / 25 m@70%	5m/10m/20m,
Range Accuracy	±3 cm	±1 cm	±1 cm	±1 cm	±3 cm	±3 cm
FPS	5 Hz / 10 Hz / 20 Hz	5 Hz / 10 Hz / 20 Hz	5 Hz/10 Hz/20 Hz	5 Hz/10 Hz/20 Hz	10 Hz/20 Hz	10 Hz
Horizontal (FOV)	120°	360°	360°	360°	360°	270°
Vertical (FOV)	25° (-18°~7°)	2.487°~89.105°	-16°~+15° -16°~+14°	-55°~+15°	/	*
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°	0.18°
Vertical (Angular Resolution)	0.125°@ROI, 0.25°@non ROI	Min2.81°	Uniform 1° Uniform 1°	Min1.33°	/	*
Data Point Generating Rate	760,000 (pts/sec)	Single Echo Dual Echo 640,000/1280,000 (pts/sec)	Single Echo Dual Echo 640,000/1280,000 (pts/sec) 320,000/640,000 (pts/sec)	640,000	1	2
Operating Temperature	-40℃ ~ +85℃	-20℃ ~ +60℃	-20℃ ~ +60℃	-20℃ ~ +60℃	-10℃~50℃	-20℃ ~ +60℃
Storage temperature	-40℃ ~ +105℃	-40℃ ~ +85℃	-40℃ ~ +85℃	-20℃ ~ +85℃	-30℃~70℃	-40℃ ~ +85℃
IP Grade	IP 6K9K	IP67	IP67	IP 67	IP 67	IP 67
Dimensions (LxWxH)	118*90*75 mm	Φ100 mm*110 mm	Φ100 mm*110 mm	Φ102 mm*102 mm	Φ79.3*39 mm	Φ80*79.1 mm
Weight	1 kg	1000g (Standard Type)	1000g (Standard Type)	≤1500 g	200 g	397 g

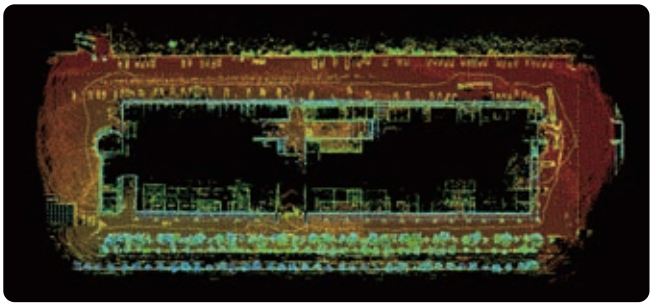
3D SLAM MAPPING AND POSITING KIT

Introduction

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 processors, 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.

PRODUCT INFOMATION

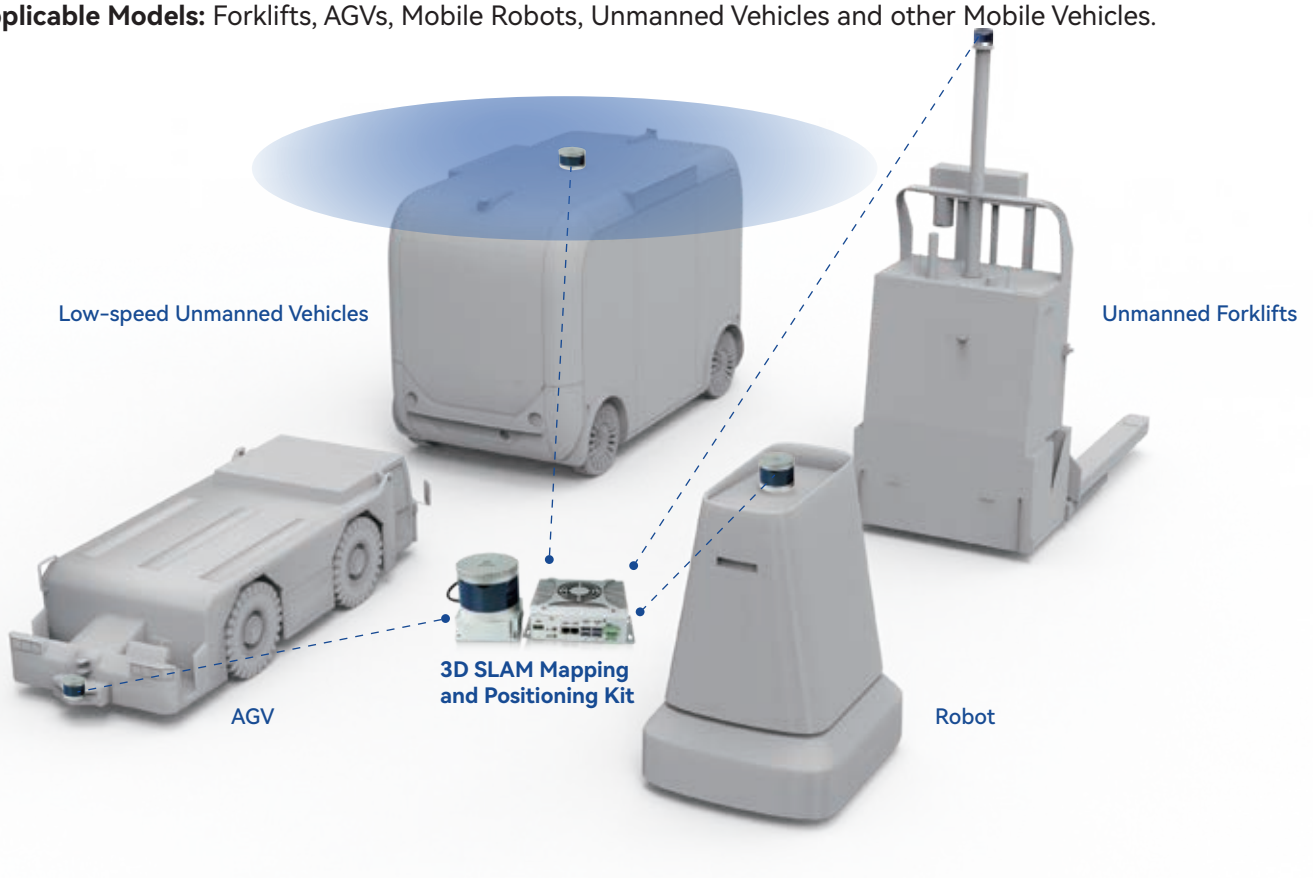




Hardware Configuration	IPC Platform	IPC Processor	Sensor data acquisition and processing, mapping and positioning computing power calculation
	LiDAR	C16	C16 Multi-line LiDAR with wide detection range and high performance (Can be adapted to other types of LiDAR)
	Supporting Positioning Sensor	IMU	Fusion 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.	

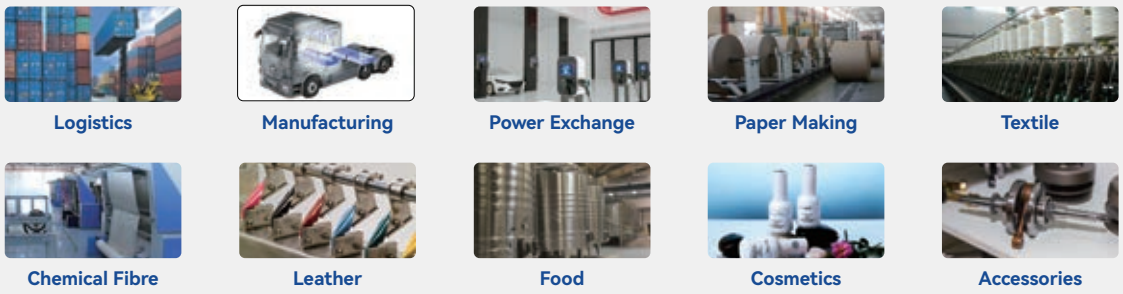
APPLICATION MODELS

Applicable Models: Forklifts, AGVs, Mobile Robots, Unmanned Vehicles and other Mobile Vehicles.



APPLICATION AREAS

Industries: Widely used in logistics, manufacturing, power exchange, paper making, textile, chemical fibre, leather, food, cosmetics, accessories and many other fields



Software Systems



WMS

1



WCS

2



FMS Intelligent Multi-Machine Scheduling System

3



AI Environmental Monitoring System

4



Intelligent Forklift Roadside Environment Sensing System

5

1 One-Stop Warehouse Management WMS

SYSTEM INTRODUCTION

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

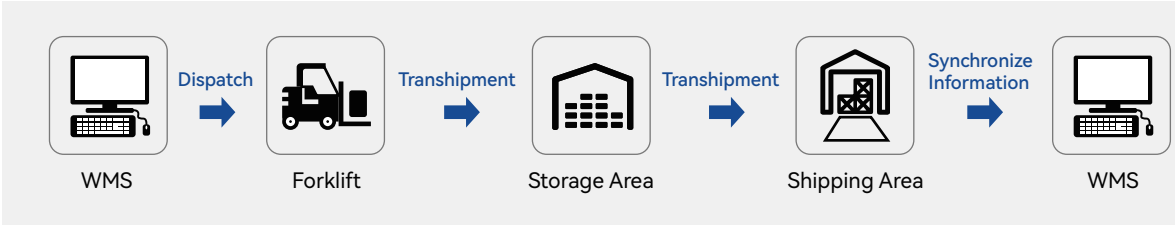
In-warehouse Management
- Shelving Operations
- Stocktaking
- Stocktaking Operations

Inventory Management
- Inventory & Material Management

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

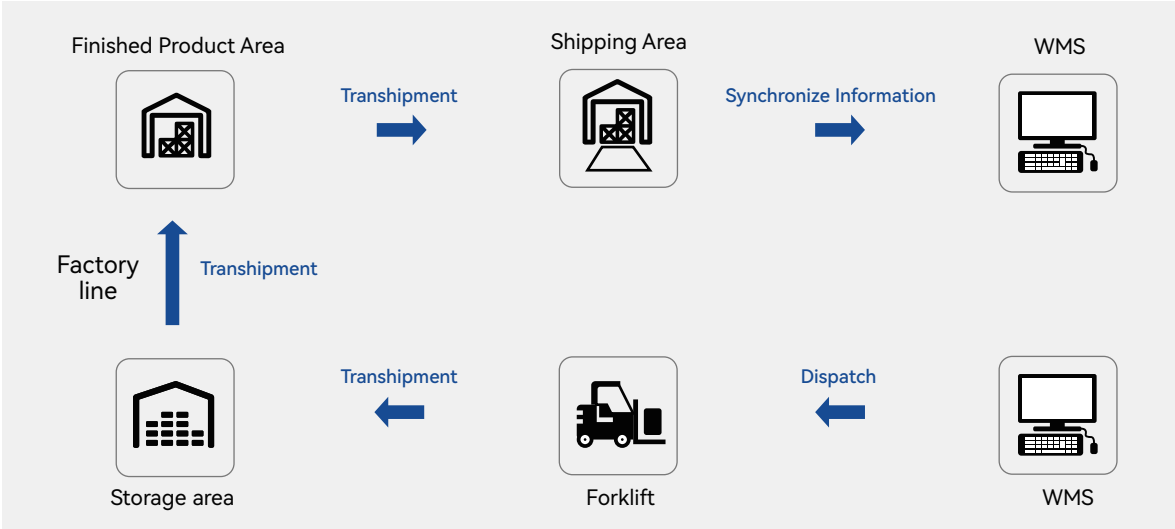
WORKFLOW

WAREHOUSING LOGISTICS



+

PRODUCTION LOGISTICS



2 Full-Scene Automated Equipment Management WCS

SYSTEM INTRODUCTION

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

3 FMS Intelligent Multi-Machine Scheduling System

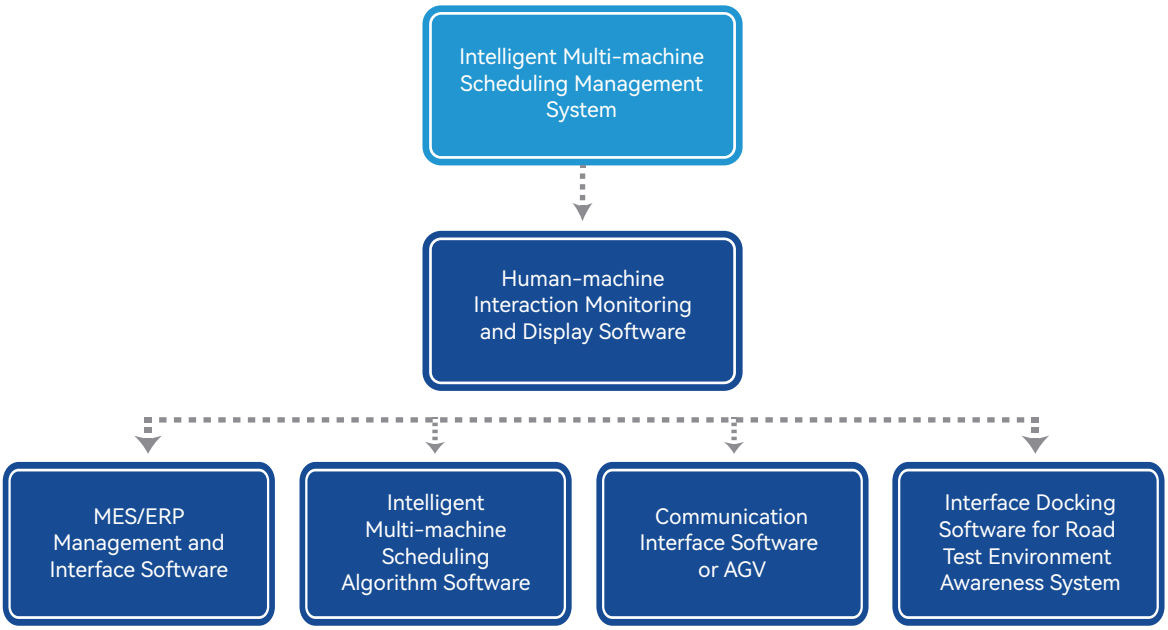
SYSTEM INTRODUCTION

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



4 AI Environment Monitoring System

SYSTEM INTRODUCTION

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

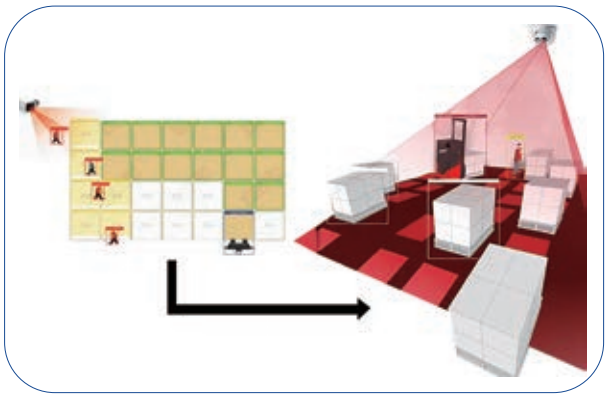


Camera Detection Effect



LiDAR Detection Effect

Visual Monitoring



LiDAR Monitoring



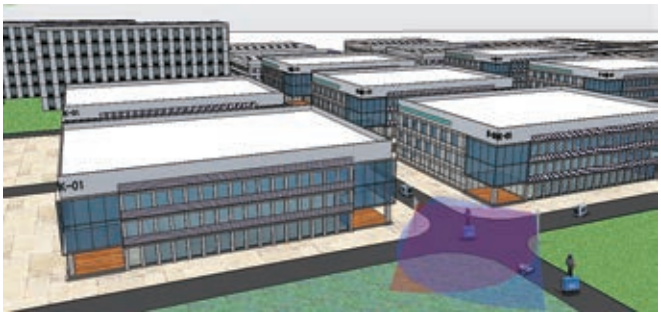
4 Intelligent Forklift Roadside Environment Sensing System

SYSTEM INTRODUCTION

LSLiDAR’s Forklift Roadside Sensing System provides all-time dynamic traffic information collection and fusion for vehicle-road cooperation. 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 nodead-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



CH128X1 + Effect of Visual Recognition and Classification



LSLiDAR + Camera

LiDAR'S INDUSTRIAL ROBOT SERIES



SAFE • STABLE • EFFICIENT • FLEXIBLE



Pallet Truck
TRT15-D

Narrow Aisle
Pallet Stacker
TRL14-B

AMR
TR-C200

Outdoor
Counterbalanced
TRE25-A

Indoor
Counterbalanced
TRE25-B

Indoor
Counterbalanced
TRP15-B

Pallet Truck
TRT20-C



Reach Type Pallet Truck

TR15-B

Product Description:

TR15-B is a small forward-moving AGV with natural naviga-ti on using multi-line LiDAR 3D SLAM technology. On the basis o f retaining the main structure of the original vehicle, it has u ndergone an intelligent automatic electrical transformation, a nd the main technical indicators are the same as the original v ehicle. Its extra-large forward-movement stroke makes it s uitable for warehouses, home appliances, printing, automo-ti ve, electronics and other industries.

Functional Features:

- Flexible and convenient deployment
- Wide application of scenes
- Accurate and stable positioning
- Stable and efficient operation
- Multiple safety protection

Forklift

Dimension (L*W*H) mm	2920/2530*1105*2090
Rated Load Capacity (kg)	2000
Load Center Distance (mm)	500
Weight (with Battery) kg	2100
Turning Radius (mm)	1985
Driving Moto (kw)	1.5
Lifting Moto (kw)	3

Fork

Dimension (l*w*h) mm	1070*122*40
Maximum Fork Width (mm)	264-732
Lifting Mode	Hydraulic Lifting
Distance Forward	670
Maximum Lifting Height (mm)	1600

Safeguard

3D Obstacle Avoidance LiDAR
Sensor at the Tip of Fork (Infrared Sensor)
Anti-Collision Strip for Sensor of Body
Three-Color Light (Sound and Light Warning Light)
Emergency Stop Button (on Both Sides)

Performance Parameters

Maximum Travel Speed (Loaded/Empty) mm/s	1400/1500
Left-Right Deviation (mm)	±20
Forward (mm)	±10
Maximum Climbable Gradient	6°

Functional Parameters

Navigation System	Leishen 3D SLAM
Navigation Mode	Natural Navigation
Communication Mode	WLAN/Supports 5G
Communication Frequency	Wi-Fi 2.4/5.8 GHz
Brake Mode	Electromagnetic Brake
Moving Function	Forward/Backward/Turn
Operating Environment	Indoor

Duration Performance

Battery Type	Lithium Battery
Voltage and Capacity (V/Ah)	24/210
Charging Mode	Manual/Automatic
Time to Full Charge (h)	<2
Continuous Working Time after Full Charge (h)	5-8
Useful Life	2-3 years
Battery Weight (kg)	200



Reach Type Pallet Truck

TR20-B

Product Description:

TR20-B is a small forward-moving AGV with natural naviga-ti on using multi-line LiDAR 3D SLAM technology. On the basis o f retaining the main structure of the original vehicle, it has u ndergone an intelligent automatic electrical transformation, a nd the main technical indicators are the same as the original v ehicle. Its extra-large forward-movement stroke makes it s uitable for warehouses, home appliances, printing, automo-ti ve, electronics and other industries.

Functional Features:

- Flexible and convenient deployment
- Wide application of scenes
- Accurate and stable positioning
- Stable and efficient operation
- Multiple safety protection

Forklift

Dimension（L*W*H） mm	2920/2530*1105*2090
Rated Load Capacity（kg）	2000
Load Center Distance（mm）	500
Weight (with Battery) kg	2100
Turning Radius（mm）	1985
Driving Moto（kw）	1.5
Lifting Moto（kw）	3

Fork

Dimension（l*w*h）mm	1070*122*40
Maximum Fork Width（mm）	264-732
Lifting Mode	Hydraulic Lifting
Distance Forward	670
Maximum Lifting Height（mm）	1600

Safeguard

3D Obstacle Avoidance LiDAR
Sensor at the Tip of Fork (Infrared Sensor)
Anti-Collision Strip for Sensor of Body
Three-Color Light (Sound and Light Warning Light)
Emergency Stop Button (on Both Sides)

Performance Parameters

Maximum Travel Speed (Loaded/Empty) mm/s	1400/1500
Left-Right Deviation（mm）	±20
Forward（mm）	±10
Maximum Climbable Gradient	6°

Functional Parameters

Navigation System	Leishen 3D SLAM
Navigation Mode	Natural Navigation
Communication Mode	WLAN/Supports 5G
Communication Frequency	Wi-Fi 2.4/5.8 GHz
Brake Mode	Electromagnetic Brake
Moving Function	Forward/Backward/Turn
Operating Environment	Indoor

Duration Performance

Battery Type	Lithium Battery
Voltage and Capacity（V/Ah）	24/210
Charging Mode	Manual/Automatic
Time to Full Charge（h）	<2
Continuous Working Time after Full Charge（h）	5-8
Useful Life	2-3 years
Battery Weight（kg）	200



Narrow Aisle Pallet Stacker

TRL14-B

Product Description:

The TRL14-B is a narrow aisle stacker AGV with multi-line LiDAR 3D SLAM natural navigation technology. Based on retaining the main structure of the original vehicle, it has undergone an intelligent automatic electrical transformation, and the main technical indicators are the same as the original vehicle. Its ultra-narrow body makes it mobile and flexible, allowing it to operate freely in narrow and small aisles. It is widely used in the logistics and warehousing industries.

Functional Features:

- Flexible and convenient deployment
- Wide application of scenes
- Accurate and stable positioning
- Stable and efficient operation
- Multiple safety protection

Forklift

Dimension（L*W*H） mm	1665*950*1960
Rated Load Capacity（kg）	1400
Load Center Distance（mm）	600
Weight (with Battery) kg	900
Turning Radius（mm）	1140
Driving Moto（kw）	1.5
Lifting Moto（kw）	3

Fork

Dimension（l*w*h）mm	1150*190*60
Maximum Fork Width（mm）	680
Lifting Mode	Hydraulic Lifting
Maximum Lifting Height（mm）	1600

Safeguard

3D Obstacle Avoidance LiDAR
Sensor at the Tip of Fork (Infrared Sensor)
Anti-Collision Strip for Sensor of Body
Three-Color Light (Sound and Light Warning Light)
Emergency Stop Button (on Both Sides)

Performance Parameters

Maximum Travel Speed (Loaded/Empty) mm/s	1300/1300
Left-Right Deviation（mm）	±20
Forward（mm）	±10
Maximum Climbable Gradient	6°

Functional Parameters

Navigation System	Leishen 3D SLAM
Navigation Mode	Natural Navigation
Communication Mode	WLAN/Supports 5G
Communication Frequency	Wi-Fi 2.4/5.8 GHz
Brake Mode	Electromagnetic Brake
Moving Function	Forward/Backward/Turn
Operating Environment	Indoor

Duration Performance

Battery Type	Lithium Battery
Voltage and Capacity（V/Ah）	24/200
Charging Mode	Manual/Automatic
Time to Full Charge（h）	<2
Continuous Working Time after Full Charge（h）	5-8
Useful Life	2-3 years
Battery Weight（kg）	200

Indoor Counterbalanced

TRP15-B



Product Description:

The TRP15-B is an indoor counterbalanced AGV with multi-line LiDAR 3D SLAM natural navigation technology. On the basis of retaining the main structure of the original vehicle, it has undergone an intelligent automatic electrical transformation, and the main technical indicators are the same as the original vehicle. It is suitable for internal loading and unloading in warehouses and is equipped with a lifting fork at the front of the vehicle, allowing it to work safely with higher efficiency.

Functional Features:

- Flexible and convenient deployment
- Wide application of scenes
- Accurate and stable positioning
- Stable and efficient operation
- Multiple safety protection

Forklift

Dimension (L*W*H) mm	2355*1078*2020
Rated Load Capacity (kg)	1500
Load Center Distance (mm)	500
Weight (with Battery) kg	2700
Turning Radius (mm)	1312
Driving Moto (kw)	2.5
Lifting Moto (kw)	3

Fork

Dimension (l*w*h) mm	1070*122*40
Maximum Fork Width (mm)	264-732
Lifting Mode	Hydraulic Lifting
Maximum Lifting Height (mm)	3000

Safeguard

3D Obstacle Avoidance LiDAR
Sensor at the Tip of Fork (Infrared Sensor)
Anti-Collision Strip for Sensor of Body
Three-Color Light (Sound and Light Warning Light)
Emergency Stop Button (on Both Sides)

Performance Parameters

Maximum Travel Speed (Loaded/Empty) mm/s	1400/1500
Left-Right Deviation (mm)	±20
Forward (mm)	±10
Maximum Climbable Gradient	6°

Functional Parameters

Navigation System	Leishen 3D SLAM
Navigation Mode	Natural Navigation
Communication Mode	WLAN/Supports 5G
Communication Frequency	Wi-Fi 2.4/5.8 GHz
Brake Mode	Electromagnetic Brake
Moving Function	Forward/Backward/Turn
Operating Environment	Indoor

Duration Performance

Battery Type	Lithium Battery
Voltage and Capacity (V/Ah)	24/270
Charging Mode	Manual/Automatic
Time to Full Charge (h)	<2
Continuous Working Time after Full Charge (h)	5-8
Useful Life	2-3 years
Battery Weight (kg)	200

Indoor Counterbalanced

TRP20-B



Product Description:

The TRP20-B is an indoor counterbalanced AGV with multi-line LiDAR 3D SLAM natural navigation technology. On the basis of retaining the main structure of the original vehicle, it has undergone an intelligent automatic electrical transformation, and the main technical indicators are the same as the original vehicle. It is suitable for internal loading and unloading in warehouses and is equipped with a lifting fork at the front of the vehicle, allowing it to work safely with higher efficiency.

Functional Features:

- Flexible and convenient deployment
- Wide application of scenes
- Accurate and stable positioning
- Stable and efficient operation
- Multiple safety protection

Forklift

Dimension (L*W*H) mm	2942*1078*2020
Rated Load Capacity (kg)	2000
Load Center Distance (mm)	500
Weight (with Battery) kg	3100
Turning Radius (mm)	1760
Driving Moto (kw)	2.5
Lifting Moto (kw)	3

Fork

Dimension (l*w*h) mm	1070*122*40
Maximum Fork Width (mm)	264-732
Lifting Mode	Hydraulic Lifting
Maximum Lifting Height (mm)	3000

Safeguard

3D Obstacle Avoidance LiDAR
Sensor at the Tip of Fork (Infrared Sensor)
Anti-Collision Strip for Sensor of Body
Three-Color Light (Sound and Light Warning Light)
Emergency Stop Button (on Both Sides)

Performance Parameters

Maximum Travel Speed (Loaded/Empty) mm/s	1400/1500
Left-Right Deviation (mm)	±20
Forward (mm)	±10
Maximum Climbable Gradient	6°

Functional Parameters

Navigation System	Leishen 3D SLAM
Navigation Mode	Natural Navigation
Communication Mode	WLAN/Supports 5G
Communication Frequency	Wi-Fi 2.4/5.8 GHz
Brake Mode	Electromagnetic Brake
Moving Function	Forward/Backward/Turn
Operating Environment	Indoor

Duration Performance

Battery Type	Lithium Battery
Voltage and Capacity (V/Ah)	24/270
Charging Mode	Manual/Automatic
Time to Full Charge (h)	<2
Continuous Working Time after Full Charge (h)	5-8
Useful Life	2-3 years
Battery Weight (kg)	200



Pallet Truck

TRT15-C

Product Description:

The TRT15-C is an indoor AGV pallet truck with multi-line LiDAR 3D SLAM natural navigation technology. On the basis of retaining the main structure of the original vehicle, it has undergone an intelligent automatic electrical transformation, and the main technical indicators are the same as the original vehicle. It is suitable for internal loading and unloading in warehouses and is equipped with a lifting fork at the front of the vehicle, allowing it to work safely with higher efficiency.

Functional Features:

- Flexible and convenient deployment
- Wide application of scenes
- Accurate and stable positioning
- Stable and efficient operation
- Multiple safety protection

Forklift

Dimension（L*W*H） mm	1686*1007*2075
Rated Load Capacity（kg）	1500
Load Center Distance（mm）	600
Weight (with Battery) kg	335
Turning Radius（mm）	1500
Driving Moto（kw）	0.9
Lifting Moto（kw）	0.84

Fork

Dimension（l*w*h）mm	1150*170*55
Maximum Fork Width（mm）	685
Lifting Mode	Hydraulic Lifting
Maximum Lifting Height（mm）	120

Safeguard

3D Obstacle Avoidance LiDAR
Sensor at the Tip of Fork (Infrared Sensor)
Anti-Collision Strip for Sensor of Body
Three-Color Light (Sound and Light Warning Light)
Emergency Stop Button (on Both Sides)

Performance Parameters

Maximum Travel Speed (Loaded/Empty) mm/s	1250/1400
Left-Right Deviation（mm）	±20
Forward（mm）	±10
Maximum Climbable Gradient	6°

Functional Parameters

Navigation System	Leishen 3D SLAM
Navigation Mode	Natural Navigation
Communication Mode	WLAN/Supports 5G
Communication Frequency	Wi-Fi 2.4/5.8 GHz
Brake Mode	Electromagnetic Brake
Moving Function	Forward/Backward/Turn
Operating Environment	Indoor

Duration Performance

Battery Type	Lithium Battery
Voltage and Capacity（V/Ah）	24/60
Charging Mode	Manual/Automatic
Time to Full Charge（h）	<2
Continuous Working Time after Full Charge（h）	3-4
Useful Life	2-3 years
Battery Weight（kg）	14

Pallet Truck

TRT15-D



Product Description:

The TRT15-D is an indoor AGV pallet truck with multi-line LiDAR 3D SLAM natural navigation technology. On the basis of retaining the main structure of the original vehicle, it has undergone an intelligent automatic electrical transformation, and the main technical indicators are the same as the original vehicle. It is suitable for internal loading and unloading in warehouses and is equipped with a lifting fork at the front of the vehicle, allowing it to work safely with higher efficiency.

Functional Features:

- Flexible and convenient deployment
- Wide application of scenes
- Accurate and stable positioning
- Stable and efficient operation
- Multiple safety protection

Forklift

Dimension（L*W*H） mm	1590*850*1800
Rated Load Capacity（kg）	1500
Load Center Distance（mm）	600
Weight (with Battery) kg	375
Turning Radius（mm）	1335
Driving Moto（kw）	1.0
Lifting Moto（kw）	0.8

Fork

Dimension（l*w*h） mm	1150*173*60
Maximum Fork Width（mm）	680
Lifting Mode	Hydraulic Lifting
Maximum Lifting Height（mm）	120
Minimum Lifting Height（mm）	88

Safeguard

3D Obstacle Avoidance LiDAR
Sensor at the Tip of Fork (Infrared Sensor)
Anti-Collision Strip for Sensor of Body
Three-Color Light (Sound and Light Warning Light)
Emergency Stop Button (on Both Sides)

Performance Parameters

Maximum Travel Speed (Loaded/Empty) mm/s	1100 /1250
Lifting speed: full/unloaded (mm/s)	35/45
Descent speed full/no load (mm/s)	48/36
Left-Right Deviation（mm）	±20
Forward（mm）	±10
Maximum Climbable Gradient	6°

Functional Parameters

Navigation System	Leishen 3D SLAM
Navigation Mode	Natural Navigation
Communication Mode	WLAN/Supports 5G
Communication Frequency	Wi-Fi 2.4/5.8 GHz
Brake Mode	Electromagnetic Brake
Moving Function	Forward/Backward/Turn
Operating Environment	Indoor

Duration Performance

Battery Type	Lithium Battery
Voltage and Capacity（V/Ah）	48/50
Charging Mode	Manual/Automatic
Time to Full Charge（h）	<1
Continuous Working Time after Full Charge（h）	4-6
Useful Life	2-3 years

Pallet Truck

TRT20-C



Product Description:

The TRT20-C is an indoor AGV pallet truck with multi-line LiDAR 3D SLAM natural navigation technology. On the basis of retaining the main structure of the original vehicle, it has undergone an intelligent automatic electrical transformation, and the main technical indicators are the same as the original vehicle. It is suitable for internal loading and unloading in warehouses and is equipped with a lifting fork at the front of the vehicle, allowing it to work safely with higher efficiency.

Functional Features:

- Flexible and convenient deployment
- Wide application of scenes
- Accurate and stable positioning
- Stable and efficient operation
- Multiple safety protection

Forklift

Dimension (L*W*H) mm	1940*1007*2260
Rated Load Capacity (kg)	2000
Load Center Distance (mm)	600
Weight (with Battery) kg	680
Turning Radius (mm)	1785
Driving Moto (kw)	1.5
Lifting Moto (kw)	0.84

Fork

Dimension (l*w*h) mm	1150*170*55
Maximum Fork Width (mm)	685
Lifting Mode	Hydraulic Lifting
Maximum Lifting Height (mm)	110

Safeguard

3D Obstacle Avoidance LiDAR
Sensor at the Tip of Fork (Infrared Sensor)
Anti-Collision Strip for Sensor of Body
Three-Color Light (Sound and Light Warning Light)
Emergency Stop Button (on Both Sides)

Performance Parameters

Maximum Travel Speed (Loaded/Empty) mm/s	1400/1500
Left-Right Deviation (mm)	±20
Forward (mm)	±10
Maximum Climbable Gradient	6°

Functional Parameters

Navigation System	Leishen 3D SLAM
Navigation Mode	Natural Navigation
Communication Mode	WLAN/Supports 5G
Communication Frequency	Wi-Fi 2.4/5.8 GHz
Brake Mode	Electromagnetic Brake
Moving Function	Forward/Backward/Turn
Operating Environment	Indoor

Duration Performance

Battery Type	Lithium Battery
Voltage and Capacity (V/Ah)	24/205
Charging Mode	Manual/Automatic
Time to Full Charge (h)	<2
Continuous Working Time after Full Charge (h)	6-8
Useful Life	2-3 years
Battery Weight (kg)	62



Outdoor Counterbalanced

TRE15-B

Product Description:

The TRE15-B is an outdoor counterbalanced AGV with multi-line LiDAR 3D SLAM natural navigation technology. On the basis of retaining the main structure of the original vehicle, it has undergone an intelligent automatic electrical transformation, and the main technical indicators are the same as the original vehicle. It is suitable for internal loading and unloading in warehouses and is equipped with a lifting fork at the front of the vehicle, allowing it to work safely with higher efficiency.

Functional Features:

- Flexible and convenient deployment
- Wide application of scenes
- Accurate and stable positioning
- Stable and efficient operation
- Multiple safety protection

Forklift

Dimension (L*W*H) mm	2415*1010*2065
Rated Load Capacity (kg)	1500
Load Center Distance (mm)	500
Weight (with Battery) kg	2250
Turning Radius (mm)	1325
Driving Moto (kw)	2.3
Lifting Moto (kw)	3.5

Fork

Dimension (l*w*h) mm	920*100*35
Maximum Fork Width (mm)	220-680
Lifting Mode	Hydraulic Lifting
Maximum Lifting Height (mm)	3000

Safeguard

3D Obstacle Avoidance LiDAR
Sensor at the Tip of Fork (Infrared Sensor)
Anti-Collision Strip for Sensor of Body
Three-Color Light (Sound and Light Warning Light)
Emergency Stop Button (on Both Sides)

Performance Parameters

Maximum Travel Speed (Loaded/Empty) mm/s	1600/2000
Left-Right Deviation (mm)	±20
Forward (mm)	±10
Maximum Climbable Gradient	6°

Functional Parameters

Navigation System	Leishen 3D SLAM
Navigation Mode	Natural Navigation
Communication Mode	WLAN/Supports 5G
Communication Frequency	Wi-Fi 2.4/5.8 GHz
Brake Mode	Electromagnetic Brake
Moving Function	Forward/Backward/Turn
Operating Environment	Indoor / Outdoor

Duration Performance

Battery Type	Lithium Battery
Voltage and Capacity (V/Ah)	24/480
Charging Mode	Manual/Automatic
Time to Full Charge (h)	<2
Continuous Working Time after Full Charge (h)	5-8
Useful Life	2-3 years
Battery Weight (kg)	376



Outdoor Counterbalanced

TRE25-A

Product Description:

The TRE25-A is an outdoor counterbalanced AGV with multi-line LiDAR 3D SLAM natural navigation technology. On the basis of retaining the main structure of the original vehicle, it has undergone an intelligent automatic electrical transformation, and the main technical indicators are the same as the original vehicle. It is suitable for internal loading and unloading in warehouses and is equipped with a lifting fork at the front of the vehicle, allowing it to work safely with higher efficiency.

Functional Features:

- Flexible and convenient deployment
- Wide application of scenes
- Accurate and stable positioning
- Stable and efficient operation
- Multiple safety protection

Forklift

Dimension (L*W*H) mm	3427*1175*2225
Rated Load Capacity (kg)	2500
Load Center Distance (mm)	500
Weight (with Battery) kg	4355
Turning Radius (mm)	1986
Driving Moto (kw)	9
Lifting Moto (kw)	17

Fork

Dimension (l*w*h) mm	1000*100*45
Maximum Fork Width (mm)	220-680
Lifting Mode	Hydraulic Lifting
Maximum Lifting Height (mm)	3050

Safeguard

3D Obstacle Avoidance LiDAR
Sensor at the Tip of Fork (Infrared Sensor)
Anti-Collision Strip for Sensor of Body
Three-Color Light (Sound and Light Warning Light)
Emergency Stop Button (on Both Sides)

Performance Parameters

Maximum Travel Speed (Loaded/Empty) mm/s	2000/2000
Left-Right Deviation (mm)	±20
Forward (mm)	±10
Maximum Climbable Gradient	6°

Functional Parameters

Navigation System	Leishen 3D SLAM
Navigation Mode	Natural Navigation
Communication Mode	WLAN/Supports 5G
Communication Frequency	Wi-Fi 2.4/5.8 GHz
Brake Mode	Electromagnetic Brake
Moving Function	Forward/Backward/Turn
Operating Environment	Indoor / Outdoor

Duration Performance

Battery Type	Lithium Battery
Voltage and Capacity (V/Ah)	24/210
Charging Mode	Manual/Automatic
Time to Full Charge (h)	<2
Continuous Working Time after Full Charge (h)	5-8
Useful Life	2-3 years
Battery Weight (kg)	200



Outdoor Counterbalanced

TRE25-B

Product Description:

The TRE25-B is an outdoor counterbalanced AGV with multi-line LiDAR 3D SLAM natural navigation technology. On the basis of retaining the main structure of the original vehicle, it has undergone an intelligent automatic electrical transformation, and the main technical indicators are the same as the original vehicle. It is suitable for internal loading and unloading in warehouses and is equipped with a lifting fork at the front of the vehicle, allowing it to work safely with higher efficiency.

Functional Features:

- Flexible and convenient deployment
- Wide application of scenes
- Accurate and stable positioning
- Stable and efficient operation
- Multiple safety protection

Forklift

Dimension (L*W*H) mm	3427*1175*2225
Rated Load Capacity (kg)	2500
Load Center Distance (mm)	500
Weight (with Battery) kg	4355
Turning Radius (mm)	1986
Driving Moto (kw)	1.5 (AC)
Lifting Moto (kw)	2.2 (DC)

Fork

Dimension (l*w*h) mm	1000*100*45
Maximum Fork Width (mm)	220-680
Lifting Mode	Hydraulic Lifting
Maximum Lifting Height (mm)	3050

Safeguard

3D Obstacle Avoidance LiDAR
Sensor at the Tip of Fork (Infrared Sensor)
Anti-Collision Strip for Sensor of Body
Three-Color Light (Sound and Light Warning Light)
Emergency Stop Button (on Both Sides)

Performance Parameters

Maximum Travel Speed (Loaded/Empty) mm/s	2000/2000
Left-Right Deviation (mm)	±20
Forward (mm)	±10
Maximum Climbable Gradient	6°

Functional Parameters

Navigation System	Leishen 3D SLAM
Navigation Mode	Natural Navigation
Communication Mode	WLAN/Supports 5G
Communication Frequency	Wi-Fi 2.4/5.8 GHz
Brake Mode	Electromagnetic Brake
Moving Function	Forward/Backward/Turn
Operating Environment	Indoor / Outdoor

Duration Performance

Battery Type	Lithium Battery
Voltage and Capacity (V/Ah)	48/300
Charging Mode	Manual/Automatic
Time to Full Charge (h)	<2
Continuous Working Time after Full Charge (h)	5-8
Useful Life	2-3 years
Battery Weight (kg)	400



Outdoor Counterbalanced

TRE30-A

Product Description:

The TRE30-A is an outdoor counterbalanced AGV with multi-line LiDAR 3D SLAM natural navigation technology. On the basis of retaining the main structure of the original vehicle, it has undergone an intelligent automatic electrical transformation, and the main technical indicators are the same as the original vehicle. It is suitable for internal loading and unloading in warehouses and is equipped with a lifting fork at the front of the vehicle, allowing it to work safely with higher efficiency.

Functional Features:

- Flexible and convenient deployment
- Wide application of scenes
- Accurate and stable positioning
- Stable and efficient operation
- Multiple safety protection

Forklift

Dimension (L*W*H) mm	3430*1175*2225
Rated Load Capacity (kg)	3000
Load Center Distance (mm)	500
Weight (with Battery) kg	4886
Turning Radius (mm)	1986
Driving Moto (kw)	2*9
Lifting Moto (kw)	17

Fork

Dimension (l*w*h) mm	1000*122*45
Maximum Fork Width (mm)	220-680
Lifting Mode	Hydraulic Lifting
Maximum Lifting Height (mm)	3050

Safeguard

3D Obstacle Avoidance LiDAR
Sensor at the Tip of Fork (Infrared Sensor)
Anti-Collision Strip for Sensor of Body
Three-Color Light (Sound and Light Warning Light)
Emergency Stop Button (on Both Sides)

Performance Parameters

Maximum Travel Speed (Loaded/Empty) mm/s	2000/2000
Left-Right Deviation (mm)	±20
Forward (mm)	±10
Maximum Climbable Gradient	6°

Functional Parameters

Navigation System	Leishen 3D SLAM
Navigation Mode	Natural Navigation
Communication Mode	WLAN/Supports 5G
Communication Frequency	Wi-Fi 2.4/5.8 GHz
Brake Mode	Electromagnetic Brake
Moving Function	Forward/Backward/Turn
Operating Environment	Indoor / Outdoor

Duration Performance

Battery Type	Lithium Battery
Voltage and Capacity (V/Ah)	24/210
Charging Mode	Manual/Automatic
Time to Full Charge (h)	<2
Continuous Working Time after Full Charge (h)	5-8
Useful Life	2-3 years
Battery Weight (kg)	200



Outdoor Counterbalanced

TRE35-A

Product Description:

The TRE35-A is an outdoor counterbalanced AGV with multi-line LiDAR 3D SLAM natural navigation technology. On the basis of retaining the main structure of the original vehicle, it has undergone an intelligent automatic electrical transformation, and the main technical indicators are the same as the original vehicle. It is suitable for internal loading and unloading in warehouses and is equipped with a lifting fork at the front of the vehicle, allowing it to work safely with higher efficiency.

Functional Features:

- Flexible and convenient deployment
- Wide application of scenes
- Accurate and stable positioning
- Stable and efficient operation
- Multiple safety protection

Forklift

Dimension (L*W*H) mm	3435*1325*2225
Rated Load Capacity (kg)	3500
Load Center Distance (mm)	500
Weight (with Battery) kg	5592
Turning Radius (mm)	1986
Driving Moto (kw)	2*9
Lifting Moto (kw)	17

Fork

Dimension (l*w*h) mm	1000*150*50
Maximum Fork Width (mm)	220-680
Lifting Mode	Hydraulic Lifting
Maximum Lifting Height (mm)	3050

Safeguard

3D Obstacle Avoidance LiDAR
Sensor at the Tip of Fork (Infrared Sensor)
Anti-Collision Strip for Sensor of Body
Three-Color Light (Sound and Light Warning Light)
Emergency Stop Button (on Both Sides)

Performance Parameters

Maximum Travel Speed (Loaded/Empty) mm/s	2000/2000
Left-Right Deviation (mm)	±20
Forward (mm)	±10
Maximum Climbable Gradient	6°

Functional Parameters

Navigation System	Leishen 3D SLAM
Navigation Mode	Natural Navigation
Communication Mode	WLAN/Supports 5G
Communication Frequency	Wi-Fi 2.4/5.8 GHz
Brake Mode	Electromagnetic Brake
Moving Function	Forward/Backward/Turn
Operating Environment	Indoor / Outdoor

Duration Performance

Battery Type	Lithium Battery
Voltage and Capacity (V/Ah)	24/210
Charging Mode	Manual/Automatic
Time to Full Charge (h)	<2
Continuous Working Time after Full Charge (h)	5-8
Useful Life	2-3 years
Battery Weight (kg)	200

AMR

TR-C200



Product Description:

TR-C200 is a composite robot with multi-line LiDAR 3D SLAM natural navigation technology. It is a new type of robot that combines mobile and collaborative robots, widely used in logistics, warehousing, food, textile, printing, cold chain and other industries.

Functional Features:

- Fexible and convenient deployment
- Wide application of scenes
- Accurate and stable positioning
- Stable and efficient operation
- Multiple safety protection
- Easy set-up of the manipulator

AMR Specifications

Dimension(L*W*H), (Robot Arm not Included)	1000*700*600mm
Rated Load Capacity	200kg
Net Weight	150kg
Driving Mode	Differential Drive
Turning Radius	1000mm/s

Collaborative Robot

Weight	24kg
Payload Capacity	5kg
Maximum Working Radius	886.5mm
Range of Motion	-175°~+175°
Joint Velocity	Joint 1-3: 150°/s Joint 4-6: 180°/s
Tool Speed	≤2.8 m/s
Repeated Positioning Accuracy	±0.02mm
Degree of Freedom	6 Rotating Joints

Safeguard

3D Collision Avoidance LiDAR
Omnidirectional Anti-collision Strip
Emergency Stop Button on Rear Side

Performance Parameters

Rated Operating Speed (No-Load) (mm/s)	1000
Rated Operating Speed (Rated Load) (mm/s)	1000
Motion Navigation Positioning Accuracy (mm)	±30
Stop Positioning Accuracy to the Point (mm)	± 10
Maximum Speed	1.5m/s

Functional Parameters

Navigation System	Leishen 3D SLAM
Navigation Mode	Natural Navigation
Communication Mode	WLAN/Supports 5G
Communication Frequency	Wi-Fi 2.4/5.8 GHz
Brake Mode	Electromagnetic Brake
Moving Function	Forward/Backward/Turn
Operating Environment	Indoor

Duration Performance

Battery Type	Lithium Battery
Voltage and Capacity（V/Ah）	48/60
Charging Mode	Manual/Automatic
Time to Full Charge（h）	<2
Continuous Working Time after Full Charge（h）	5-8
Useful Life	2-3 years
Battery Weight（kg）	200

Automatic Tractor

TRT60-E



Product Description:

TRT60-E is an outdoor unmanned tractor with multi-line LiDAR 3D SLAM natural navigation technology, which is based on retaining the main structure of the original tractor and carrying out intelligent automatic electrical transformation. Its main technical indicators are the same as the original vehicle.

Functional Features:

- Flexible and convenient deployment
- Wide application of scenes
- Accurate and stable positioning
- Stable and efficient operation
- Multiple safety protection
- Unhook automatic

Tractor

Dimension (L*W*H)	2500*1500*2216mm
Maximum Weight of Traction (on Dry Soncrete Surface)	6000kg
Load Center Distance	500mm
Weight (with Battery)	≤4300kg
Center Height Coupler	305/405mm
Minimum Turning Radius	≤1800mm

Safeguard

3D Obstacle Avoidance LiDAR
Sensor at the Tip of Fork (Infrared Sensor)
Anti-Collision Strip for Sensor of Body
Three-Color Light (Sound and Light Warning Light)
Emergency Stop Button (on Both Sides)

Duration Performance

Battery Type	Lithium Battery
Rated Battery Voltage (V/Ah)	48/320
Charging Mode	Manual/Automotive Recharge
Time to Full Charge (h)	<2
Endurance Mileage (No-Load)	8h
Useful Life	2-3 years

Functional Parameters

Navigation System	Leishen 3D SLAM+RTK+IMU
Navigation Mode	Multi-Source Converged Navigation
Communication Mode	WLAN/Supports 5G
Communication Frequency	Wi-Fi 2.4/5.8 GHz
Brake Mode	Electromagnetic Brake
Moving Function	Forward/Backward/Turn
Operating Environment	Indoor / Outdoor

Performance Parameters

Maximum Forward Speed(Loaded/Empty)	5/10 km/h
Left-Right Deviation	±50mm
Forward	±30mm
Maximum Climbable Gradient (°)	4/7
Maximum Height of Surmountable Obstacle	≤50mm
Maximum Wattiefe	≤100mm

Automatic Tractor

TRT400-F



Product Description:

TRT400-F is an outdoor unmanned tractor with multi-line LiDAR 3D SLAM natural navigation technology, which is based on retaining the main structure of the original tractor and carrying out intelligent automatic electrical transformation. Its main technical indicators are the same as the original vehicle.

Functional Features:

- Flexible and convenient deployment
- Wide application of scenes
- Accurate and stable positioning
- Stable and efficient operation
- Multiple safety protection
- Unhook automatic

Tractor

Dimension (L*W*H)	3150*1440*2100mm
Maximum Weight of Traction (on Dry Concrete Surface)	40000kg
Load Center Distance	500mm
Weight (with Battery)	≤4300kg
Center Height Coupler	305/405mm
Minimum Turning Radius	1800mm
Wheelbase	1600mm

Safeguard

3D Obstacle Avoidance LiDAR
Anti-Collision Strip for Sensor of Body
Three-Color Light (Sound and Light Warning Light)
Emergency Stop Button (on Both Sides)
Camera

Duration Performance

Battery Type	Lithium Battery
Rated Battery Voltage (V/Ah)	44.35/173
Charging Mode	Manual
Time to Full Charge (h)	<3
Duration Time(Not-load)	8h
Useful Life	2-3 years
Endurance Mileage (No-load)	200km

Functional Parameters

Navigation System	Leishen 3D SLAM+RTK+IMU
Navigation Mode	Multi-Source Converged Navigation
Communication Mode	WLAN/Supports 5G
Communication Frequency	Wi-Fi 2.4/5.8 GHz
Brake Mode	Electromagnetic Brake
Moving Function	Forward/Backward/Turn
Operating Environment	Indoor / Outdoor

Performance Parameters

Maximum Forward Speed(Loaded/Empty)	16/26 km/h
Left-Right Deviation	±100mm
Forward	±100mm
Maximum Climbable Gradient (°)	30
Maximum Height of Surmountable Obstacle	≤80mm
Maximum Wattiefe	≤100mm
Maximum Cruising Speed	≤18km/h

Drive Safer
Work Smarter
Live Better

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