# Development Journey

## Project customization stage V1.0

### 2015
The entrepreneurial team was established



### 2013
RoboCup world champion



## Standard chassis stage V2.0

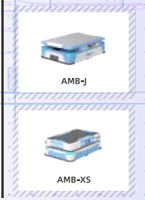
### 2017
The standard chassis came into being




### The standard controller came into being




### Expansion of chassis product series




### 2018
Launch of the SRD dispatch and operation system



## Standard controller stage V3.0

### 2020/June
SRC-3000FS enters the market; establish the strategic cooperation with SGS




### July
Establish North China, Southwest China and South China branches



### August
Comprehensively carry out the automatic forklifts business



### September
SEED enters the market




### October
A round obtains 100,000,000+ funds from GLP, ECOVACS, China Growth Capital, HARMONTRONICS AUTOMATION



### December
The sales volume breaks 100,000,000



## Control+standard+integration stage V4.0

### 2021/January
A+round obtain IDG 200,000,000+funds



### February
RoboView enters the market




### March
Comprehensively carry out the overseas business



### April
SEER's headquarters is completed



### May
Taicang production base of automatic forklifts is completed



### June
SEER exhibition hall is completed



SRC-2000(S)

SJV-W1000

ABB FANUC FESTO Haier molex ERICSSON

intel PHOENIX CONTACT PHILIPS NSK Schneider Electric HUAWEI

GREE格力 一汽-大众 KINGFA 金发科技 CETC 中国电科 ECOVACS FOXCONN

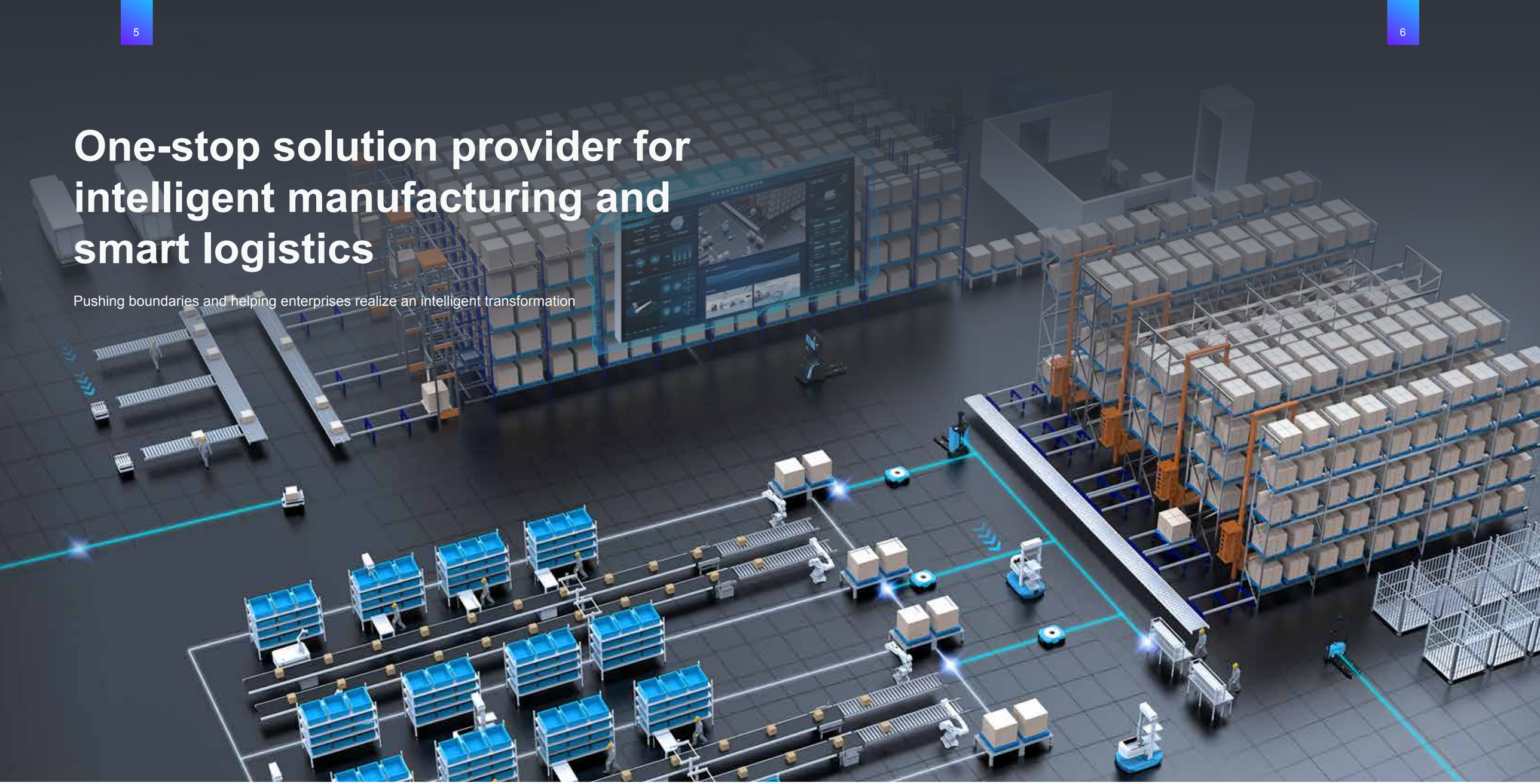
SIEMENS SHINVA 新华医疗 中国烟草 中国兵器装备集团公司 长虹 京东方 BOE

GoerTek WEICHAI 潍柴 SINOMACH SMEE 中国商飞 COMAC 遨博智能 muyuan 牧原

普洛斯 GLP SICK Linde HARMONTRONICS HELI ·····

# One-stop solution provider for intelligent manufacturing and smart logistics

Pushing boundaries and helping enterprises realize an intelligent transformation



## SRC | AMR Controller Solutions

- **Comprehensive AMR Controller**

  Compatible with a wide range of AMRs, featuring built-in functional safety, rich peripheral support, user-friendly and simple AMR construction solutions, along with precise and flexible movement controls.
- **Derivative Controller for Smart Factory Infrastructure**

## AMR | Autonomous Mobile Robot Solutions

- **Complete Suite of AMRs**

  Comprehensive coverage of Latent Jacking Robots, Picking Robots, Automatic Forklifts, Composite Robots, Roller Robots, Shuttle Picking Robots, and more.
- **Full-Process Site Logistics**

  Suitable for all aspects of site logistics, including loading and unloading, sorting, moving, bin stacking, material cage stacking, pallet stacking, warehouse inbound/outbound, and line-side deposit/access.
- **A unified dispatching system connects all product categories for efficient collaboration.**

## SEED | Enterprise Enhanced Digitalization

- **RDS | Synergistic Resource Dispatch of Robotics and Automation Equipment**

  Unified dispatch of multiple robots and automation equipment, along with the ability to optimize task dispatch.
- **MWMS | Manufacturing Warehouse Management System**

  Automated management of flat storage warehouses, pallet stereoscopic warehouses, material Box stereoscopic warehouses, and automated stereoscopic warehouses.
- **V | Data Visualization System**

  3D visualized display and interaction of real scenarios, along with visualization of operational data.

## RoboView | Visual AI Solutions

- SEER Visual AI ensures that robots can intelligently respond to complex site conditions and complete relevant production tasks.

  Visual AI enables real-time storage site, personnel, and integrated AMR management.
- The vision algorithm analyzes site situations, ensures safety during AMR obstacle avoidance deployment, and detects open flames, foreign obstacles, and other hazards to ensure work and production safety.

# Advantages

To deliver “Standardized Products, Customized Applications”, SEER adheres to the product concepts of upward integration, downward development, and full-scenario solutions. SEER’s people-oriented software and hardware implementation tools help solve problems from the root, realize the intelligent transformation of traditional enterprises, and empower smart logistics across various industries.

## Core Control | True Integration

SEER’s proprietary core controller provides enterprises with factory-wide smart logistics solutions that realize true integration rather than the subcontracting typical of other industry solutions.

## Large Robot Library | Full Coverage + Zero Development Costs

Built-in SEER controllers empower a large library of robots with convenient dispatch functionality to realize full coverage of requirements. Zero-cost upper-layer system development meets project upgrade requirements, realizes true integration, greatly shortens the delivery cycle, and saves on both time and capital investment.

## Various Application Scenario Experience | 800+ Projects

Adhering to its mission of “Standardized Products, Customized Applications”, SEER provides one-stop solutions to continuously empower 300+ end customers, 200+ integrators, and 300+ robot manufacturers in sectors such as computers, communications, and consumer electronics; semiconductors; lithium batteries; automobiles; pharmaceuticals; and FMCG across 5,000 application scenarios.

# One-stop solution provider for intelligent manufacturing and smart logistics

ERP | MES | MOS | APS | SCM | SCADA

**SEED | Enterprise Enhanced Digitalization**

- **RDS** – Synergistic Resource Dispatch of Robotics and Automation Equipment
- **MWMS** – Manufacturing Warehouse Management System
- **V** – Data Visualization System

**RoboView | Visual AI Solutions**

- Sensor Node
- Sensor Platform

**AMR Series**

- SRC-powered Laser SLAM Multilayer Picking Robot (SPK-HAI-A42-3)
- SRC-powered Laser SLAM Stacker Automatic Forklift (SFL-L14)
- SRC-powered Laser SLAM Mini Automatic Forklift (SFL-MP10S)
- SRC-powered Laser SLAM Counter Balanced Stacking Automatic Forklift (SFL-CPD15-T)
- SRC-powered Laser SLAM Small Stacker Automatic Forklift (SFL-CDD14)
- SRC-powered Laser SLAM Transfer Automatic Forklift (SFL-CBD20-S)
- SRC-powered Rotating Jacking Transfer Robot (SJV-SW500)
- SRC-powered Jacking Robot (SJV-W1000)
- SRC-powered Laser SLAM Omni-directional Latent Jacking Transfer Robot (SJV-W600DS-DL)
- SRC-powered Jacking Robot (SJV-W500)
- AMB-powered Composite Robot

**SRC Series Core Controllers**

- SRC-2000
- SRC-3000FS

**Configuration and Debugging Tool**

- Roboshop pro

# SRC | AMR Controller Solutions

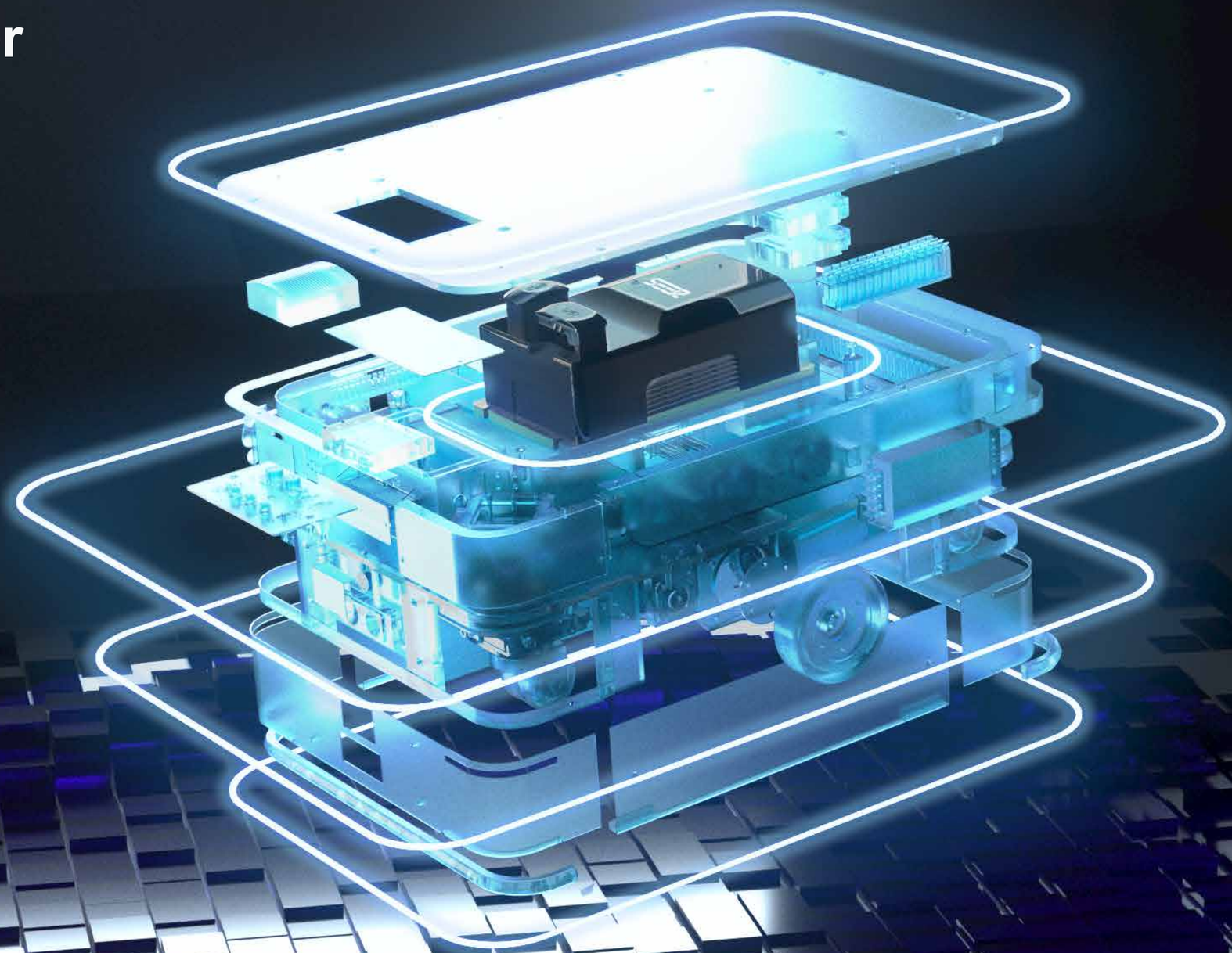
## Super High-Speed AI Engine

## SRC Series Core Controllers

SRC Series Core Controllers are universal controllers designed for mobile robot (AGV, AMR, Automatic Forklift, etc) applications providing mobile robots with core functions such as mapping, positioning and navigation, and model editing. The product integrates the core components of mobile robots and works with our powerful client software (Roboshop Pro) to help users quickly deploy robots.

The SRC series core controller can also transform into a controller for smart factory infrastructures such as automatic charging piles, automatic doors, lifts, traffic lights, RGVs, hoisters, stackers and more. By providing a unified scheduling interface framework, the SRC series core controller facilitates the intelligent transformation and enhanced automation of factories in a comprehensive manner.

SRC series core controller provides a wide range of external APIs such as RS232, RS485, CAN, Gigabit Ethernet, USB, and DI/Power DO to allow adaptation to a variety of non-standard requirements, includes multi-sensor safety protection (including but not limited to software expansions such as lasers, bumpers, I/O ultrasonic, and photoelectricity) and supports a variety of communication protocols, along with ModBus and TCP/IP for external calls.



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# Controller Solutions Make Building AMRs Easier

The SEER Controller Solution provides clients with not just a SRC series controller, but also a full suite of technical services covering SEER's huge model library and advanced support. The solution includes:

01 **Controller Hardware**

02 **One-stop implementation tool: Roboshop Pro**

03 **Software and hardware kit**

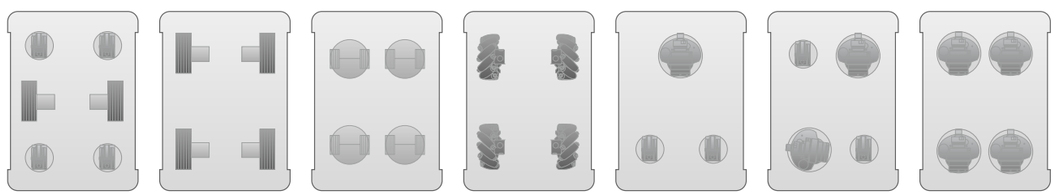
04 **Model Selection Guide and Commissioning Manual**

05 **Training Courses and After-Sales Services**

06 **Iterative Software Update Service**

## 01 Standardized Software/Hardware Configurations Supports a Variety of Models

When integrated with the Robokit unified control software, SRC series core controller can support a variety of motion models, various large forklift models, along with various omnidirectional heavy-duty chassis configurations through SEER's one-stop implementation software (Roboshop Pro). While ensuring the lowest possible learning costs, SEER provides clients with solutions for different types of AMR through a single controller.



Dual Wheels (Differential) | Four-wheel Drive Differential | Four Differential | FWD Mecanum Wheels | Single-steering wheel | Dual-steering Wheels | Quadruple steering wheel

## 02 Ultra-Adaptability + Major Brand Compatibility

In addition to its powerful functions, SRC series core controller boasts a wide range of compatibility. SEER has completed product adaption with major sensor and motor manufacturers, and will continue to work closely with them to develop an AMR ecosystem.

### Lidars

SICK, Velodyne, RoboSense, OLEI, HOKUYO, ……

### Servo Motors

MOTEC, RoboteQ, Copley Controls, Kinco 步科, SYNTRON 森创, Leadshine, TECHNOSOFT, MOONS', ADVANCED MOTION CONTROLS, TONGYI AUTOMATION 同毅自动化, maxon, Nanotec, ZAPI, ESTUN AUTOMATION, CURTIS, ……

### Sensors

Autonics 奥托尼克斯, Kübler, 图漾科技 PERCIPIO.XYZ, LIVOX, Baumer Passion for Sensors, SICK, HOKUYO, ……

### Other

OMRON, MOXA, IDEC, 广东德坦智能动力有限公司, 百为 BAIWAY, YM Tech Co., Ltd, 有人物联网, ……

## 03 Comprehensive Functions, Easier to Build Robots

Overall and optimal basic functions, combining with plentiful and practical optional functions, help customers to address all kinds of mobile robot application problems with one-stop solution.

### Basic Functions

- Map editing
- Model editing
- Localization module
- Navigation module
- Differential motion model
- Peripheral extension function (roller, jacking, latent hook)
- API
- Visible operation

### Optional Functions

- Double-steering wheel motion model
- Four-wheel drive Mecanum wheel motion model
- Single-steering wheel motion model
- Multi-robot dispatching
- Forklift basic kit
- Material cage recognition kit
- Wifi roaming
- Automatic charging
- QR code precise positioning
- QR code navigation
- Shelf recognition and spin jacking
- Laser reflector navigation
- 3D obstacle avoidance

## 04 Vehicle Variety for Complex Scenarios

Various types of AMRs powered by SRC series core controller provide solutions to over 20 industries for a variety of problems across a wide range of applications scenarios.







……

## 05 Adaptable to Customized Demands

The powerful hardware and software capabilities of SRC controllers help flexibly meet customized client demands.

### Supports Remote Analysis

Powerful site logging, restoration, and log analysis.

### Real-Time Display of Robot Operating Parameters

Support for configuration of model file visualization and dynamic modification.

### Accurate Robot Calibration

Fixes laser rudder angle and other installation errors and automatically tests AMR performance limits.

### Rich I/O Interface Variety

Supports RS485, RS232, and CAN peripherals.




## Product Map of SRC Series Core Controller



High-End

Safety-function SRC

**SRC-3000**

CAN*2+RS485*2
RS485/232/CAN for BMS*1
DI*24+DO*16
Encoder interface*2
Ethernet*5




All in one
Combine with robot arm controller

**SRC-5000**

Safety-Function AMR

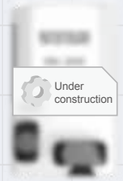


Middle End

Full function SRC

**SRC-2000**

CAN*2
RS485/232 for BMS*1
RS485*3
DI*11+DO*10
Ethernet*6




Full function SRC

**SRC-2000 Lite**

CAN*2
RS485/232 for BMS*1
RS485*3
DI*11+DO*10

AMR



Entry-End

Visual Identity SRC

**SRC-1600**

Built-in RoboView
3A@24V
Ethernet × 2
USB3.0 × 2



Multifunctional SRC series core controller

**SRC-800**

Four-Way Railcar RGV
QR-Code Navigation AGV
Service Robot, Cleaning Robot
Factory Infrastructure Management,
Hoister and Stacker

RGV & AGV



Hand operator

**SFL-Handle**



Portable Operator

Android Roboshop

Peripherals

# One-stop implementation tool: Roboshop Pro

Roboshop Pro is a one-stop implementation tool provided by SEER, which can uniformly manage and configure all intelligent devices with built-in SEER SRC series controllers. Roboshop Pro, a simple but strong software, provides an efficient solution for the implementation of smart logistics.

## Home Page



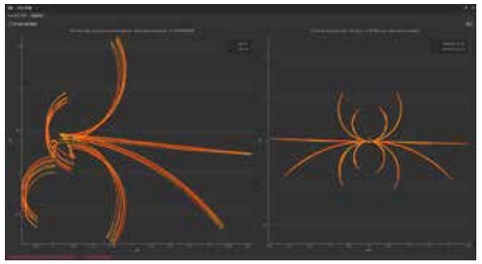
Manages and configures all intelligent equipment in the LAN uniformly, including robots, intelligent equipment and various automation devices based on the SEER SRC series core controller.

## SLAM



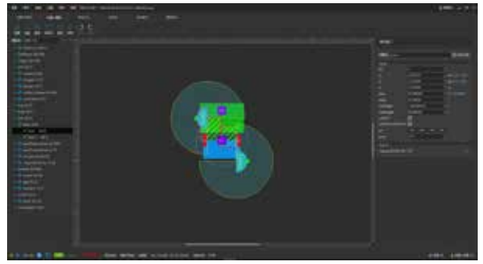
Simultaneous localization and mapping enables 2D or 3D maps to build accurately and efficiently.

## Robot Calibration



Automatic calibration process eliminates mechanical and assembly errors to ensure the consistency of multiple robots.

## Robot Model Editing



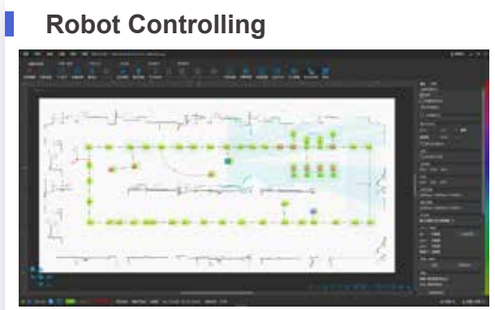
Visual robot model editing covers size, motion model, drive model, lidar model, motor position, sensor position, peripheral mechanism and more, thus robot making is as simple as building blocks.

## Map Editing



With easy-to -use map editing tools and high detail control, it can be smoothly edit even for large maps and what you see is what you get.

## Robot Controlling



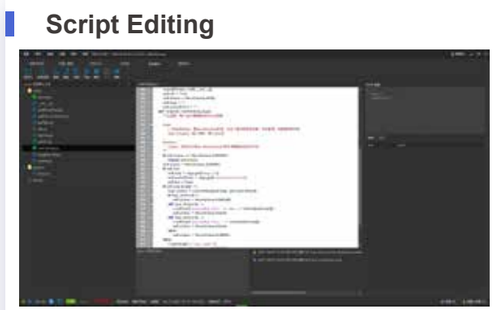
The robot is controlled in real time; The manual and automatic modes are freely switched, and the API commands are fully covered.

## Log Analysis



Integrated log analysis tool analyzes robot running logs automatically, easy to check errors.

## Script Editing



With Python script programming, it's beyond doubt to control however complex the peripheral mechanism and logic are.

## Parameter Configuration



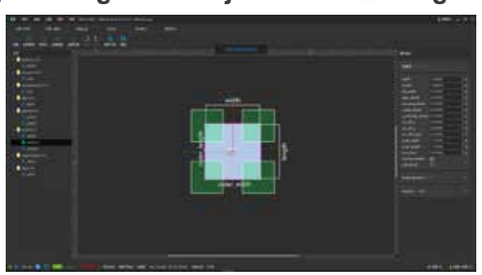
Rich configurable parameters to grasp details at your fingertips. Running Status Detailed status monitoring to get robot data at a glance.

## Running Status



Detailed status monitoring to get robot data at a glance.

## Recognition Object Model Editing



Visual recognition object model editing allows all kinds of shelves, racks, pallets and cages to recognize online.

## Dispatching Scenario Editing



Integrated with RDS Core dispatching system, scenario editing adds such scenes as multi-type and multi-floor robot maps, charging piles, mutually exclusive areas, lifts, traffic lights, control cabinets, and automation devices for unified dispatching management.

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# SRC Series Core Controllers Parameter

| ●Standard<br>○Optional<br>—None |  |  |  |  |  |
|---|---|---|---|---|---|
| **Product model** | **QR code navigation version (SRC-800-Q)** | **Single laser chassis version (SRC-800-T)** | **Service chassis version (SRC-800-S)** | **RGV version (SRC-800-R)** | **Peripheral controller (SRC-800-P)** |
| **Application Scenario Description** | For QR code navigation robot, with QR code scanner and obstacle avoidance laser, for jacking and spinning | For economic AMR, with single laser SLAM, for jacking | For service robot, with single laser SLAM,and wheel hub motor | For RGV, with QR code scanners and obstacle avoidance laser | For lift control, gate control, charging pile control, hoister, stacker, and light vision scene |
| **CPU** | Quad-core Cortex A35@1.2GHz<br>Single-core Cortex M4@266MHz | Quad-core Cortex A35@1.2GHz<br>Single-core Cortex M4@266MHz | Quad-core Cortex A35@1.2GHz<br>Single-core Cortex M4@266MHz | Dual-core Cortex A35@1.2GHz<br>Single-core Cortex M4@266MHz | Dual-core Cortex A35@1.2GHz<br>Single-core Cortex M4@266MHz |
| **RAM** | 2GB LPDDR4 (32 Bit) | 2GB LPDDR4 (32 Bit) | 2GB LPDDR4 (32 Bit) | 1GB LPDDR4 (16 Bit) | 1GB LPDDR4 (16 Bit) |
| **Flash** | 8GB | 8GB | 8GB | 4GB | 4GB |
| **WiFi** | Dual-band 802.11ac 2x2 MU-MIMO | Dual-band 802.11ac 2x2 MU-MIMO | Dual-band 802.11ac 2x2 MU-MIMO | Dual-band 802.11ac 2x2 MU-MIMO | Dual-band 802.11ac 2x2 MU-MIMO |
| **IMU** | ● | ● | ● | ● | - |
| **Temperature and Humidity Sensor** | ● | ● | ● | ● | - |
| **Ethernet** **2-Way 1Gb Ethernet Port** | Debug or Connect to Other Sensors | Debug or Connect to Navigation Laser and Other Sensors | Debug or Connect to Navigation Laser and Other Sensors | Debug or Connect to Obstacle Avoidance Laser and Other Sensors | - |
| **Ethernet** **1-Way 100Mb Ethernet Port** | Extend Wi-Fi Client or Other Functions | Extend Wi-Fi Client or Other Functions | Extend Wi-Fi Client or Other Functions | Extend Wi-Fi Client or Other Functions | Debug or extend to other functions |
| **DO (PNP)** | 10-Way (Including 2 PDO 1A) | 10-Way (Including 2 PDO 1A) | 10-Way (Including 2 PDO 1A) | 10-Way (Including 2 PDO 1A) | 8-Way |
| **DI (NPN)** | 10-Way | 10-Way | 10-Way | 10-Way | 8-Way |
| **RS232 (IoT Module Communication Expansion)** | - | - | - | 1-Way (optional) | - |
| **CAN (Driver Communication)** | 2-Way (Isolated) | 2-Way (Isolated) | 2-Way (Isolated) | 2-Way (Isolated) | 1-Way (Isolated) |
| **RS485 (Battery Communication)** | 1-Way (Isolated) | 1-Way (Isolated) | 1-Way (Isolated) | 1-Way (Isolated) | 1-Way (Isolated) |
| **RS485 (Light Strip Or Other Display)** | 1-Way | 1-Way | 1-Way | 1-Way | - |
| **RS485 (QR Code Scanner)** | 2-Way | 2-Way | 2-Way | 4-Way | - |
| **CAN (Obstacle Avoidance Sensor)** | - | - | - | 1-Way (non-isolated) | - |
| **Power ON/OFF Interfaces** | One-Button Power ON/OFF | One-Button Power ON/OFF | One-Button Power ON/OFF | One-Button Power ON/OFF | One-Button Power ON/OFF |
| **Emergency Stop Input** | 1-Way | 1-Way | 1-Way | 1-Way | 1-Way |
| **Emergency Stop Output** | 2-Way | 2-Way | 2-Way | 2-Way | 2-Way |
| **Battery Switch** | 1-Way | 1-Way | 1-Way | 1-Way | - |
| **USB2.0** | 2-Way | 2-Way | 2-Way | 2-Way | - |
| **Audio Output** | 1-Way | 1-Way | 1-Way | 1-Way | 1-Way |
| **Power Supply** | 24V1A (excluding DO output current) | 24V1A (excluding DO output current) | 24V1A (excluding DO output current) | 24V500mA (excluding DO output current) | 24V500mA (excluding DO output current) |
| **L*W*H** | 172*120*40mm | 172*120*40mm | 172*120*40mm | 172*115*33mm | 172*115*33mm |
| **IP Rating** | IP20 | IP20 | IP20 | IP20 | IP20 |
| **Working Temperature & Humidity** | TEMP: -25~50°C / RH: 10~90%, no compression, no condensation | TEMP: -25~50°C / RH: 10~90%, no compression, no condensation | TEMP: -25~50°C / RH: 10~90%, no compression, no condensation | TEMP: -25~50°C / RH: 10~90%, no compression, no condensation | TEMP: -25~50°C / RH: 10~90%, no compression, no condensation |
| **Navigation Accuracy*** | ±10mm, ±1° | ±10mm, ±1° | ±10mm, ±1° | ±10mm, ±1° | - |
| **Navigation Speed** | ⩽2m/s | ⩽2m/s | ⩽1.5m/s | ⩽2m/s | - |
| **Map Area (single frame)** | - | ⩽100000m² | ⩽100000m² | - | - |
| **Automatic Charging** | ● | ● | ● | ● | - |

Note: Related parameters may be updated, please pay attention to the product manual.

* Navigation accuracy usually refers to the repeatability accuracy that a robot navigates to the station.

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| ●Standard ○Optional —None |  |  |  |
|---|---|---|---|
| **Product model** | **SRC-2000-I(S)** | **SRC-2000-F(S)** | **SRC-3000FS** |
| **Functional Safety** Safety Integrity Level | - | - | IEC 61508 SIL2 |
| Safety Performance Level | - | - | ISO 13849-1 Cat.3 PLd |
| **Controller Performance** CPU | x86 Dual-core | x86 Dual-core | Cortex A72 * 2 + Cortex A53 * 4 + Cortex M4 * 2 |
| Internal Storage | 4GB DDR3 | 4GB DDR3 | 4GB LPDDR4 |
| First Hard Disk | 64GB SSD | 64GB SSD | 16GB eMMC |
| Second Hard Disk | - | - | ○ |
| **Digital Input & Output** Power DO | 8-Way (single-loaded 24V/2A; 8-Way total load capacity ⩽5A) | 8-Way (single-loaded 24V/2A; 8-Way total load capacity ⩽5A) | 4-Way (single-loaded 24V/1A; 4-Way total load capacity ⩽4A) |
| DO | 2-Way | 2-Way | 12-Way |
| DI | 11-Way (NPN) | 11-Way (NPN) | 24-Way (NPN or PNP) |
| **Bus Interface** CAN | 2-Way | 2-Way | 3-Way |
| RS485 | 3-Way | 3-Way | 3-Way |
| Battery Communication Interfaces | 1-Way (RS485/RS232 optional interface) | 1-Way (RS485/RS232 optional interface) | 1-Way (CAN/RS485/RS232 optional interface) |
| Sin/Cos Encoder Interfaces | - | - | 2-Way |
| **Internet Interface** Ethernet | 6 + 1 Way Gigabit (1 is for extended Wi-Fi client) | 6 + 1 Way Gigabit (1 is for extended Wi-Fi client) | Five-Way Gigabit (TSN) |
| Wi-Fi | Dual-band 2.4G/5G 802.11ac 1T1X | Dual-band 2.4G/5G 802.11ac 1T1X | Dual-band 2.4G/5G 802.11ac 2T2X |
| LTE/5G | - | - | ○ |
| **Other Interfaces** USB2.0 | 2-Way | 2-Way | 1-Way |
| USB3.0 | 2-Way | 2-Way | 2-Way |
| Audio Input/Output | 1/1-Way | 1/1-Way | 1/1-Way |
| **Robot-Specific Functions** One-Button Power ON/OFF | 1-Way | 1-Way | 1-Way |
| Battery Switch | 1-Way | 1-Way | 1-Way |
| Emergency Stop Input | 1-Way | 1-Way | 1-Way |
| Emergency Stop Output | 2-Way | 2-Way | 2-Way |
| **Parameter Performance** Navigation Accuracy* | ±10mm, ±1° | ±10mm, ±1° | ±10mm, ±1° |
| Navigation Speed | ⩽2m/s | ⩽2m/s | ⩽2m/s |
| Map Area (single frame) | ⩽400000m² | ⩽400000m² | ⩽400000m² |
| **Function** Basic Features | ● | ● | ● |
| Advanced Motion Model | ○ | ○ | ○ |
| Forklift Basic Kit | - | ● | ○ |
| Wi-Fi Roaming | ○ | ○ | ○ |
| Automatic Charging | ● | ● | ● |
| Other Advanced Features | ○ | ○ | ○ |
| **Working Environment Parameters** Working Temperature & Humidity | TEMP: 0~50°C / RH: 10~90%, no compression, no condensation | TEMP: 0~50°C / RH: 10~90%, no compression, no condensation | TEMP: -30~55°C / RH: 10~90%, no compression,no condensation |
| Working Voltage | 22~26V/150mVpp | 22~26V/150mVpp | 22~55V/150mVpp |
| Working Current | <2A (excluding DO output current) | <2A (excluding DO output current) | <1A (excluding DO output current) |
| IP Rating | IP42 | IP42 | IP65 |
| Length * Width * Height | 225*128*84mm | 225*128*84mm | 218*140*64.8mm |
| **Certified Product** CE | Conform to EN 61010-1:2010, CE-EMC (IEC 61326-1) Standards | Conform to EN 61010-1:2010, CE-EMC (IEC 61326-1) Standards | Conform to EN 61010-1:2010, CE-EMC(IEC 61326-1) , IEC 61508 SIL2, ISO 13849-1 Cat.3 PLd Standards |

Note: Related parameters may be updated, please pay attention to the product manual.

* Navigation accuracy usually refers to the repeatability accuracy that a robot navigates to the station.

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**Complete Suite of AMRs**

Comprehensive coverage of Latent Jacking Robots, Picking Robots, Automatic Forklifts, Composite Robots, Roller Robots, Shuttle Picking Robots, and more.

**Full-Process Site Logistics**

Suitable for all aspects of site logistics, including loading and unloading, sorting, moving, bin stacking, material cage stacking, pallet stacking, warehouse inbound/outbound, and line-side deposit/access.

**A unified dispatching system connects all product categories for efficient collaboration.**



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# AMR Series Products



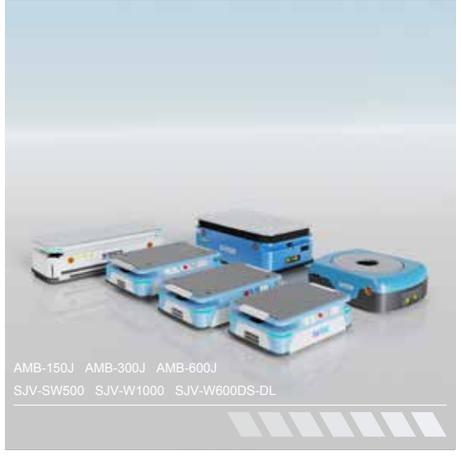

## Standardized Auto Mobile Bases

The AMB (Auto Mobile Base) series products are standard AMR chassis equipped with laser SLAM technology; core mapping, positioning, and navigation functions; and abundant internal extension ports that allow for the mounting of upper modules to adapt to a variety of AMR applications.



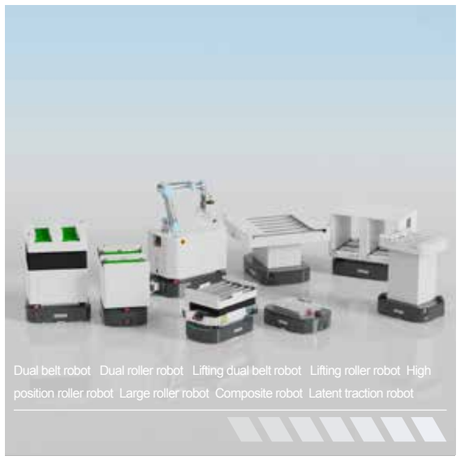

## Automatic Forklift

The SRC-powered laser SLAM automatic forklifts come equipped with an internal SRC core controller along with 360° safety to meet the requirements of loading and unloading, sorting, moving, high-elevation shelf stacking, material cage stacking, and pallet stacking application scenarios. This series of robots features a wide range of models, a large variety of loads, and supports customization to provide powerful solutions for the moving of pallets, material cages, and racks.




## Standard Latent Jacking Transfer Robot

The AMB-J and SJV series of laser SLAM standard latent jacking transfer robots come equipped with an internal SRC series core controller and smart recognition functionality. They are capable of satisfying a variety of transfer scenarios with a load of 150-1000kg, and provide efficient and rapid solutions for rack transfer.




## Customized AMRs

SEER's customized AMRs powered by standard AMR chassis is based on the company's concept of "Standardized Products, Customized Applications". This meets the moving demands of various highly customized scenarios.




## Picking Robot

The world's first laser SLAM Multilayer Picking Robot, equipped with SRC series core controllers. By utilizing Visual AI, robots realizes the accurate picking and placement of materials and flexible matching of multiple operational heights to meet the flexible connection requirements of different platforms such as rollers, shelves, latent AMRs, and manual workstations, and serves as the perfect facilitator for factory's lineside warehouses.




## Accessories

Special accessories for robots (primarily charging piles and handheld devices) provide users with a more flexible and efficient experience.

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# Autonomous Mobile Robot Solutions

**Step1.** Select the appropriate AMR in accordance with the standard load type.

| Load Type | Robot Type |
| --- | --- |
| Racks | Standard Latent Jacking Transfer Robot |
| Material Box | Picking Robot |
| Material Cage | Automatic Forklift |
| Material Cage | |
| Tray/Pallet | |
| Tray/Pallet | |
| Small Parts / Tray | Customized AMRs |
| | Composite Robot |

**Step2.** Select corresponding standardized solutions in accordance with application scenarios.

## Application Scenarios and Solutions

### Application Scenario

Scenarios are not suitable for laser navigation



### Solution

Optional QR Code Camera | QR Code Navigation/Reflector Navigation

### Application Scenario

Obstacles with pits or other surfaces that cannot be scanned by lasers

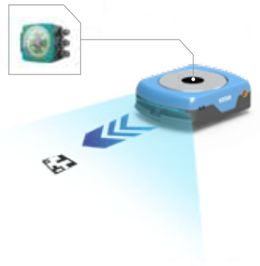


### Solution

Optional 3D camera | Obstacle avoidance and detours

### Application Scenario

Ultra-high precision docking



### Solution

Optional Camera Vision | QR Code Precision Alignment

### Application Scenario

The materials rack has no load limit and no fixed posture



### Solution

Optional 3D camera | Automatic recognition and adjustment

# Autonomous Mobile Robot Solutions

**Step2.** Select corresponding standardized solutions in accordance with application scenarios.

### Application Scenario
The pallet/tray has no load limit and no fixed posture.

### Solution
Optional 3D camera | Automatic recognition and adjustment



### Application Scenario
The material cage has no load limit and no fixed posture.

### Solution
Rack laser recognition or Optional 3D camera | Automatic recognition and adjustment



### Application Scenario
Racks need to remain at a constant angle relative to the ground.

### Solution
Select a jacking robot with spin functionality | Omnidirectional Jacking Robot



### Application Scenario
Outdoor forklift scenarios

### Solution
Optional 3D camera | Automatic recognition and adjustment



# Other Application Scenarios and Solutions

| | |
|---|---|
| **Wireless networks prohibited** | Optional module of optical communication. |
| **Specific safety certification demands** | Select a robot certified for safety. |
| **Specific cleanliness demands** | Select a robot certified for clean operations. |
| **Moving of customized objects** | Add different types of attachments to the forklift. |
| **High-elevation rack demands** | Access and pallet identification of high-elevation racks allows for XYZ axis adjustment and correction. |
| **Material cage stacking demands** | Limited ground space: Precision stacking is realized through navigation and positioning.<br>Unlimited ground space: Stacking identification is realized through a 3D material cage recognition camera. |
| **Dense warehouse storage demands** | Located by raising the height of the laser or adding vision-assisted. |
| **Wooden pallet and deformable material stacking requirements** | Adjust the fork in the z-axit by visual algorithm recognition. |

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# TRB Series Parameter

●Standard ○Optional —None

| Product model | | TRB-150 / TRB-150-D | TRB-300 / TRB-300-D | TRB-500 / TRB-500-D | TRB-300XS |
|---|---|---|---|---|---|
| Basic parameters | Navigation method | Laser SLAM | Laser SLAM | Laser SLAM | Laser SLAM |
| | Drive mode | Two-wheel differential | Two-wheel differential | Two-wheel differential | Two-wheel differential |
| | Shell color | Pearl white / Pearl black / Customized color | Pearl white / Pearl black / Customized Color | Pearl white / Pearl black / Customized Color | RAL9003 |
| | L*W*H (mm) | 800*560*200 | 1000*700*200 | 1000*700*200 | 845*585*300 |
| | Rotation diameter (mm) | 840 | 1040 | 1040 | 980 |
| | Weight (with battery) (kg) | 66 | 144 | 130 | 120 |
| | Load capacity (kg) | 150 | 300 | 500 | 300 |
| Performance parameters | Minimum passable width (mm) | 700 | 840 | 840 | 725 |
| | Navigation position accuracy (mm)* | ±5 | ±5 | ±5 | ±5 |
| | Navigation angle accuracy (°)* | ±0.5 | ±0.5 | ±0.5 | ±0.5 |
| | Navigation speed (m/s) | ≤1.4 | ≤1.4 | ≤1.0 | ≤1.5 |
| Battery parameters | Battery specifications (V/Ah) | 48/35 (Ternary lithium) | 48/52 (Ternary lithium) | 48/52 (Ternary lithium) | 48/40 (Ternary lithium) |
| | Comprehensive battery life (h) | 12 | 12 | 10 | 8 |
| | Charging time (10-80%) (10-80%) (h) | ≤2 | ≤2.5 | ≤2.5 | ≤ 2.5 |
| | Charging method | Manual/Automatic/Switch | Manual/Automatic/Switch | Manual/Automatic/Switch | Manual/Automatic/Switch |
| Extended interfaces | Power DO | Seven-Way (total load capacity 24V/2A) | Seven-Way (total load capacity 24V/2A) | Seven-Way (total load capacity 24V/2A) | Three-Way (total load capacity 24V/2A) |
| | DI | Ten-Way (NPN) | Ten-Way (NPN) | Ten-Way (NPN) | Eleven-Way (PNP/NPN) |
| | E-stop interface | Two-Way output | Two-Way output | Two-Way output | Two-Way output |
| | Wired network | Three-Way RJ45 gigabit ethernet | Three-Way RJ45 gigabit ethernet | Three-Way RJ45 gigabit ethernet | Two-Way M12 X-Code gigabit ethernet |
| Configurations | Lidar number | 1 or 2 (P+F R2000-HD) | 1 or 2 (P+F R2000-HD) | 1 or 2 (P+F R2000-HD) | 2 (SICK nanoScan3) |
| | HMI display | ● | ● | ● | - |
| | E-stop button | ● | ● | ● | ● |
| | Buzzer | ● | ● | ● | - |
| | Speaker | ● | ● | ● | ● |
| | Ambient light | ● | ● | ● | ● |
| | Bumper strip | - | - | - | ● |
| Functions | Wi-Fi roaming | ● | ● | ● | ● |
| | Automatic charging | ● | ● | ● | ● |
| | Shelf recognition | ● | ● | ● | ● |
| | Laser reflector navigation | ○ | ○ | ○ | ○ |
| | 3D obstacle avoidance | ○ | ○ | ○ | ○ |
| Certifications | ISO 3691-4 | - | - | - | ● |
| | EMC/ESD | ● | ● | ● | ● |
| | UN38.3 | ● | ● | ● | ● |
| | RoHS | ● | ● | ● | ● |
| | REACH | ● | ● | ● | ● |
| | Cleanliness | - | - | - | ISO Class 4 |

* Navigation accuracy usually refers to the repeatability accuracy that a robot navigates to the station.

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# Jacking Robots Parameter

●Standard ○Optional —None

| | Product model | TRB-150J | TRB-300J | TRB-600J | TRV-SW500 | TRV-W1000 | TRV-W600DS-DL |
|---|---|---|---|---|---|---|---|
| Basic parameters | Navigation method | Laser SLAM | Laser SLAM | Laser SLAM | Laser SLAM | Laser SLAM | Laser SLAM |
| | Drive mode | Two-wheel differential | Two-wheel differential | Two-wheel differential | Two-wheel differential | Two-wheel differential | Dual steering wheel omnidirectional |
| | Shell color | Silver and black / Customized color | Silver and black / Customized color | Silver and black / Customized color | Blue/ Customized color | Blue / Customized color | RAL9003 / Customized color |
| | L*W*H (mm) | 780*550*260 | 880*600*260 | 930*650*260 | 924*762*300 | 1224*730*420 | 1276*546*365 |
| | Rotation diameter (mm) | 909 | 1020 | 1110 | 1035 | 1350 | 1330 |
| | Weight (with battery) (kg) | 145 | 166 | 165 | 200 | 250 | 320 |
| | Load capacity (kg) | 150 | 300 | 600 | 500 | 1000 | 600 |
| | Jacking platform dimensions (mm) | 760*530 | 860*580 | 940*630 | Ø600 | 1200*700 | 1250*510 |
| | Maximum jacking height (mm) | 60±2 | 60±2 | 60±2 | 60±2 | 60±2 | 60±2 |
| Performance parameters | Minimum passable width (mm) | 690 | 740 | 790 | 880 | 850 | 660 |
| | Navigation position accuracy (mm)* | ±5 | ±5 | ±5 | ±5 | ±5 | ±5 |
| | Navigation angle accuracy (°)* | ±0.5 | ±0.5 | ±0.5 | ±0.5 | ±0.5 | ±0.5 |
| | Navigation speed (m/s) | ⩽1.5 | ⩽1.5 | ⩽1.5 | ⩽1.6 | ⩽1.6 | ⩽1.2 |
| Battery parameters | Battery specifications (V/Ah) | 48/21 (Lithium Iron Phosphate) | 48/27 (Lithium Iron Phosphate) | 48/27 (Lithium Iron Phosphate) | 48/40 (Lithium Iron Phosphate) | 48/42 (Lithium Iron Phosphate) | 48/40 (Lithium Iron Phosphate) |
| | Comprehensive battery life (h) | 8 | 8 | 8 | 10 | 8 | 8 |
| | Charging time (10-80%) (h) | ⩽0.5 | ⩽0.5 | ⩽0.5 | ⩽1.5 | ⩽1.5 | ⩽1.5 |
| | Charging method | Manual/Automatic/Switch | Manual/Automatic/Switch | Manual/Automatic/Switch | Manual/Automatic | Manual/Automatic | Manual/Automatic/Switch |
| Configurations | Lidar number | 2 (P+F R2000 + OLEI LR-1BS2) | 2 (P+F R2000 + OLEI LR-1BS2) | 2 (P+F R2000 + OLEI LR-1BS2) | 1 (SICK nanoScan3 / P+F R2000-HD) | 2 (SICK nanoScan3 / P+F R2000-HD + OLEI LR-1BS2) | 2 (SICK nanoScan3) |
| | Number of low-position obstacle avoidance photoelectric | 4 | 4 | 4 | - | - | - |
| | Cargo detection | ○ | ○ | ○ | - | - | - |
| | E-stop button | ● | ● | ● | ● | ● | ● |
| | Speaker | ● | ● | ● | ● | ● | ● |
| | Atmosphere light | ● | ● | ● | ● | ● | ● |
| | Bumper strip | ● | ● | ● | ● | ● | ● |
| Functions | Wi-Fi roaming | ● | ● | ● | ● | ● | ● |
| | Automatic charging | ● | ● | ● | ● | ● | ● |
| | Shelf recognition | ● | ● | ● | ● | ● | ● |
| | Spin | - | - | - | ● | - | - |
| | Precise location with QR code | - | - | - | ○ | ○ | ○ |
| | QR code navigation | - | - | - | ○ | ○ | ○ |
| | Laser reflector navigation | ○ | ○ | ○ | ○ | ○ | ○ |
| Certifications | EMC/ESD | ● | ● | ● | ● | ● | ● |
| | UN38.3 | ● | ● | ● | ● | ● | ● |
| | RoHS | ● | ● | ● | ● | ● | ● |
| | REACH | ● | ● | ● | ● | ● | ● |

* Navigation accuracy usually refers to the repeatability accuracy that a robot navigates to the station.

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# Picking Robots Parameter

●Standard ○Optional —None

| Product model | | TRAI-A42M-3 | TRAI-A42-3 | TRAI-A42-5 | TRAI-A42-7 |
|---|---|---|---|---|---|
| Basic parameters | Navigation method | Laser SLAM | Laser SLAM | Laser SLAM | Laser SLAM |
| | Drive mode | Two-wheel differential | Two-wheel differential | Two-wheel differential | Two-wheel differential |
| | Pickimg method | Rotating fork hug + 2D vision correction + Guide bar | Rotating fork hug + 2D vision correction + Guide bar | Rotating fork hug + 2D vision correction + Guide bar | Rotating fork hug + 2D vision correction + Guide bar |
| | Shell color | Blue + White / Glossy | Blue + White / Glossy | Blue + White / Glossy | Blue + White / Glossy |
| | L*W*H (mm) | 1300*800*2100 | 1600*1000*2220 | 1600*1000*3420 | 1600*1000*4220 |
| | Rotation diameter (mm) | 1300 | 1600 | 1600 | 1600 |
| | Weight (with battery) (kg) | 330 | 400 | 440 | 480 |
| | Maximum load of material box (kg) | 30 | 30 | 30 | 30 |
| | Overall maximum load of robot (kg) | 150 | 150 | 150 | 210 |
| | Basket number | 3 | 3 | 5 | 7 |
| | Applicable material box size (mm) | 450*380*300 | 600*400*300 | 600*400*300 | 600*400*300 |
| | Minimum picking height (mm) | 400 | 400 | 400 | 400 |
| | Maximum picking height (mm) | 1740 | 1860 | 3060 | 3860 |
| Performance parameters | Minimum passable width (mm) | 1000 | 1200 | 1200 | 1200 |
| | Navigation location accuracy (mm) * | ±10 | ±10 | ±10 | ±10 |
| | Navigation angle accuracy (°) * | ±1.0 | ±1.0 | ±1.0 | ±1.0 |
| | Navigation speed (m/s) | ⩽1.3 | ⩽1.3 | ⩽1.3 | ⩽1.3 |
| | Maximum lifting speed (m/s) | 0.5 | 0.5 | 0.5 | 0.5 |
| | Fork rotation 90° time (s) | 2 | 2 | 2 | 2 |
| | Average picking / placing time of external shallow location (s) | 7.5/7.5 | 7.5/7.5 | 7.5/7.5 | 7.5/7.5 |
| | Internal average picking / placing time | 4.0/4.0 | 4.0/4.0 | 4.0/4.0 | 4.0/4.0 |
| Battery parameters | Battery specifications (V/Ah) | 48/35 (Lithium Iron Phosphate) | 48/35 (Lithium Iron Phosphate) | 48/35 (Lithium Iron Phosphate) | 48/35 (Lithium Iron Phosphate) |
| | Comprehensive battery life (h) | 8 | 6 | 6 | 6 |
| | Charging time (10-80%) (h) | ⩽1.5 | ⩽1.5 | ⩽1.5 | ⩽1.5 |
| | Charging method | Automatic | Automatic | Automatic | Automatic |
| Configurations | Lidar number | 2 (SICK nanoScan3 + OLEI LR-1BS2) | 2 (SICK nanoScan3 + OLEI LR-1BS2) | 2 (SICK nanoScan3 + OLEI LR-1BS2) | 2 (SICK nanoScan3 + OLEI LR-1BS2) |
| | E-stop button | ● | ● | ● | ● |
| | Speaker | ● | ● | ● | ● |
| | Ambient light | ● | ● | ● | ● |
| | Bumper strip | ● | ● | ● | ● |
| | Lifting limit protection | ● | ● | ● | ● |
| | Lifting anti-falling | ● | ● | ● | ● |
| | Motor shaft lock protection | ● | ● | ● | ● |
| | Adjustable tray | ○ | ○ | ○ | ○ |
| Functions | Wi-Fi roaming | ● | ● | ● | ● |
| | Automatic charging | ● | ● | ● | ● |
| | 2D recognition for picking / placing material box | ● | ● | ● | ● |
| | Bar code recognition of material box | ● | ● | ● | ● |
| | QR code navigation | ○ | ○ | ○ | ○ |
| Certifications | EMC/ESD | ● | ● | ● | ● |
| | UN38.3 | ● | ● | ● | ● |

* Navigation accuracy usually refers to the repeatability accuracy that a robot navigates to the station.

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| **Customized Robots Parameter***<br>●Standard<br>○Optional<br>—None |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
| **Product name** | **Dual belt robot** | **Dual roller robot** | **Lifting dual belt robot** | **Lifting roller robot** | **High position roller robot** | **Large roller robot** | **Composite robot** | **Latent traction robot** |
| L*W*H(mm) | 800*560*835 | 1000*700*850 | 720*560*1150 | 831*560*592.5 | 800*560*999 | 1000*1170*160 | 1000*600*800 | 800*560*297 |
| Suitable material size(mm) | | 420*330 | 420*160 | 600*500 | 300*400 | 900*(650±5) | / | / |
| Load capacity(kg) | 50*2 | 40*2 | 30*2 | 60*1 | 60*1 | 300*1 | / | / |
| Transfer method | Single layer duel belt | Single layer duel roller | Single layer duel belt | Single layer single roller | Single layer single roller | Single layer single roller | Collaborative arm movements | Tract and release with the traction bar |
| Machine docking height(mm) | 750±3 | 340±3 | 1065±3 | 551±3 | 960±3 | 680±2 | / | / |
| Jacking height(mm) | / | / | 60 | 60 | / | / | / | 47 |
| Jacking time(mm/s) | / | / | 12 | 12 | / | / | / | 12 |
| Transfer speed(mm/min) | 1.2-6 (Manually adjustable) | 3.4-33.8(Manually adjustable) | 5-15(Manually adjustable) | 6-60.8 (Manually adjustable) | 4-49.9 (Manually adjustable) | 3.1-22.4 (Manually adjustable) | / | / |
| Shell color | RAL7035 | RAL7035 | RAL7035 | RAL7035 | RAL7035 | RAL7035 | RAL7035 | RAL7035 |
| Material in-position detection | Three groups of optoelectronics for each belt | Three groups of optoelectronics for each roller | Three groups of optoelectronics for each belt | Three groups of optoelectronics for each roller | Three groups of optoelectronics for each roller | Three groups of optoelectronics for each roller | / | / |
| Chassis | Based on AMB-150 series | Based on AMB-300 series | Based on AMB-150 series | Based on AMB-150 series | Based on AMB-150 series | Based on AMB-300 series | Based on AMB-300 series | Based on AMB-150 series |

* Only common customized robots are listed here. For more details, please contact us to disuss.

| **Charging Piles Parameter**<br>●Standard<br>○Optional<br>—None |  |  |  |  |  |  | **Forklift Handles Parameter**<br>●Standard<br>○Optional<br>—None |  |
|---|---|---|---|---|---|---|---|---|
| **Product model** | **TEXC-24100-00** | **TS-1500** | **TS-1502** | **TCS-2001** | **TCS-2500** | **TCS-3501** | **Product model** | **TFL-Handle** |
| L*W*H (mm) | 500*420*800 | 450*450*384 | 450*450*384 | 466*417*298.5 | 466*417*298.5 | 455*320*400 (Charging pile) + 335*200*380 (Charging head) | Product name | Forklift handle |
| Charging head projecting length (mm) | 150 | 150 | 150 | 137 | 137 | 85 | L*W*H (mm) | 160*110*86 |
| Charging head projecting height (mm) | 350/500 | 116-137 | 116-137 | 20-30 | 20-30 | 300 | Weight (kg) | 1.5-2 |
| AC input voltage (VAC) | 220±10% | 220 | 220 | 220 | 220 | 220 | Rated voltage (V) | DC24±10% |
| Input frequency (Hz) | 50 | 50-60 | 50-60 | 50-60 | 50-60 | 50-60 | Rated current (mA) | 500 |
| DC output voltage(VDC) | 24 | 48 | 48 | 48 | 48 | 48 | | |
| Maximum output voltage(V) | 24 | 54.6±0.2 | 54.6±0.2 | 54.6±0.2 | 54.6±0.2 | 54.6±0.2 | | |
| DC output current(ADC) | 100 | 15 | 15 | 20 | 25 | 30 | | |
| Maximum output current(A) | 100 | 15±5% | 15±5% | 20±5% | 25±5% | 30±5% | | |
| Maximum output power(W) | 3000 | 900 | 900 | 1200 | 1500 | 1800 | | |
| Running noise(dB) | ⩽55 | ⩽50 | ⩽50 | ⩽50 | ⩽50 | ⩽55 | | |
| Weight(kg) | 43.5 | 18 | 18 | 19 | 20 | 37 | | |
| Installation method | Ground reinforcement | Ground reinforcement | Ground reinforcement | Ground reinforcement | Ground reinforcement | Ground reinforcement | | |
| Cooling method | Air-cooled | Air-cooled | Air-cooled | Air-cooled | Air-cooled | Air-cooled | | |
| Socket specifications | Type C 16A | Type C 10A | Type C 10A | Type C 10A | Type C 10A | Type C 16A | | |
| Applicable model | For automatic forklift | For AMB & AMB-J series | For SFL-MP10S | For AMB-300J & AMB-600J | For AMB-300 & AMB-500 | For SPK series | | |

# SEED | Enterprise Enhanced Digitalization

Enterprise Enhanced Digitalization

## Digitalization Solutions for Manufacturing Enterprises

proprietary SEED product series includes a Synergistic Resource Dispatch of Robotics and Automation Equipment (RDS), Manufacturing Warehouse Management System (MWMS), and a data visualization system. SEED provides enterprises with warehouse operations management, and data visualization solutions across a wide range of automated logistics scenarios.




Support interconnection with MES, ERP, TMS, OMS, and other high-level operational systems through Web API, Web Service, Modbus, and Database.

Troysupply.com

# RDS | Synergistic Resource Dispatch of Robotics and Automation Equipment

RDS, a dispatching management system developed independently by SEER, is used for multiple robots and related automatic devices. With series parallel task model, RDS provides a powerful process engine through low-code development for business developers and supports global dispatching by priority, dynamic dispatching, preemption and other advanced features.

## Functionality



### One-Stop Implementation

Multi-area, multi-robot, and multi-equipment project implementation through a single tool.



### Flexible Task Engine

Define AMR/equipment tasks through low-code development with a graphical display of task flows.



### Multi-AMR Simulation

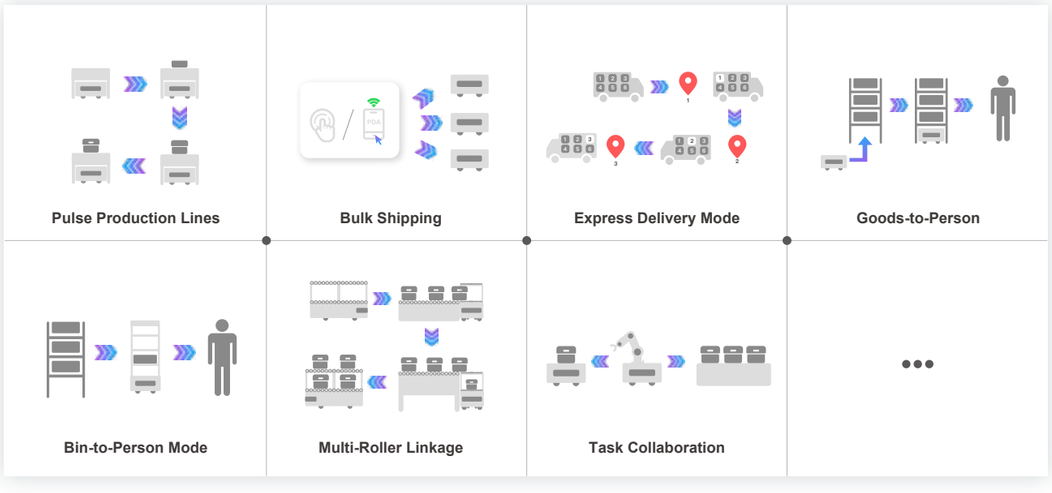
High levels of application scenario simulation, featuring high accuracy and adjustable timeframes.



### Smart Dispatch

Congestion prediction, dynamic programming, and area-based traffic management.

## Typical Scenarios






# V | Data Visualization System

V utilizes data visualization technologies to realize the reconstruction of real scenarios in the 3D virtual world to directly show the whole business situation.

## Functionality

**Rich Visualization Components**

**Big Screen Template**

**Drag and Drop**

**Visualized Configuration**



### Data Visualization Tool

Users can utilize the visualization components and templates to create their own displays.



### 3D Visualized Development

Integrates the virtual and real to realize remote monitoring, remote control, and other functions.

# MWMS | Manufacturing Warehouse Management System

MWMS is a warehouse management system (WMS) for manufacturing and other enterprises engaged in the transfer of goods.

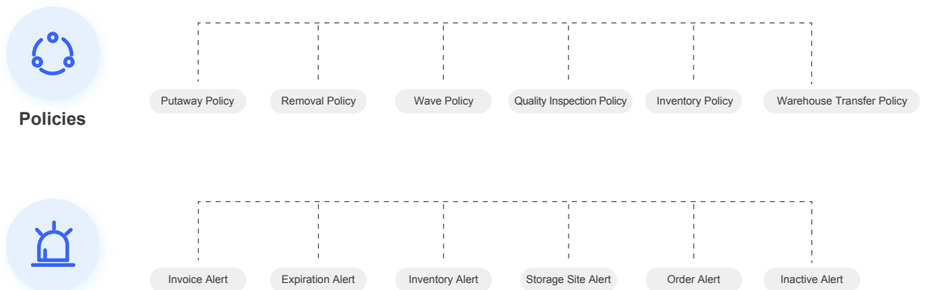
## Functionality



Intuitive overview display of storage site status



Provides accurate logs and operational reports



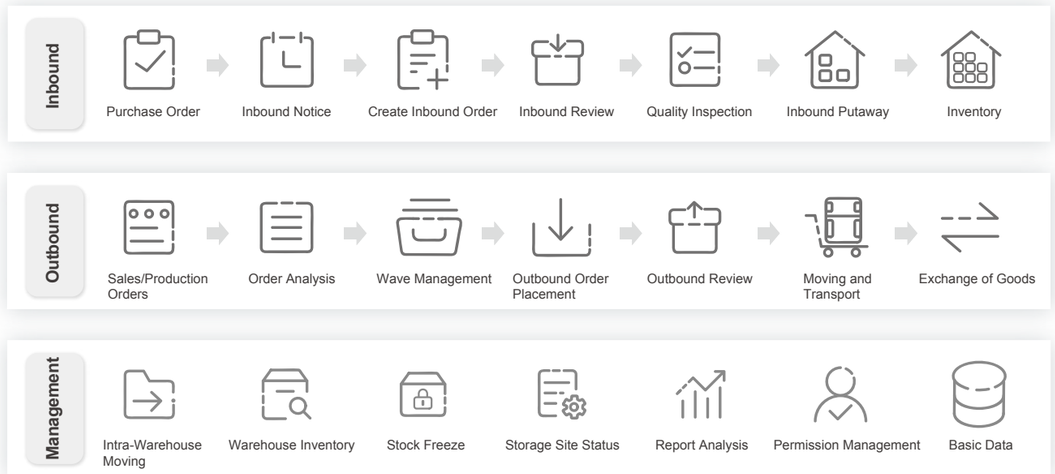

Rich operational strategies and comprehensive early warning management



### Collaborative Handheld Terminal Operations

When used to scan QR codes, PDA handheld terminals can accurately and efficiently complete examination, quality inspection, inventory, and other tasks.

## Primary Operations



# RoboView | Visual AI Solutions

## The factory’s all-seeing eye

The RoboView Visual AI solution utilizes advanced backend machine vision algorithms (RoboView Server) and an intuitive and easy-to-use frontend interface (RoboView GUI) to provide clients with Visual AI in production, safety, management, and other application scenarios. The solution covers the entire process of preliminary research, mid-term R&D, deployment, and later product maintenance and upgrades to help enhance production efficiency and accelerate intelligent transformation.

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# RoboView Solution Layout

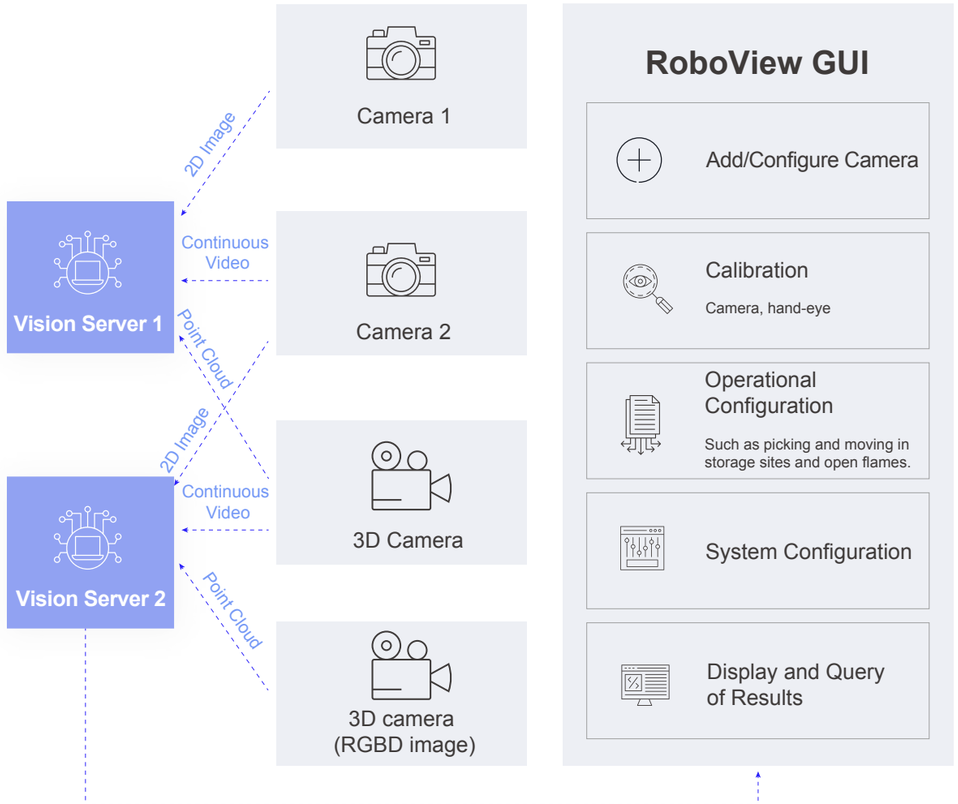
**01** RoboView Server Algorithm Platform

**02** RoboView GUI Interactive Software

**03** Vision Server

**04** 2D/3D Camera

**05** Training Courses and After-Sales Services




# RoboView Server | Algorithm Server

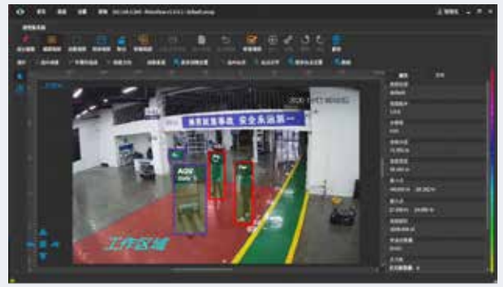
## The core of Visual AI solutions

RoboView Server is a powerful algorithm platform that includes a variety of machine vision algorithm packages. The platform supports the flexible integration of various vision algorithms to create easy-to-deploy and practical workflow solutions, and enables the efficient completion of production scenario tasks.

**Algorithms include:**Cutting-edge deep learning (detection, positioning, segmentation, tracking), 3D recognition, positioning, posture evaluation, OCR, QR Code recognition, and hand-eye calibration algorithms used to link execution structures of robotic arms and AMRs.

# RoboView GUI | Interactive Software

RoboView GUI is interactive software that integrates deployment, configuration, rendering, and display. The software includes native support for SEER's RoboView Server algorithm backend, along with multiple platforms (including Windows and Linux).



RoboView GUI operational interface

# Other Hardware Equipment

**Vision Server:**RoboView Server runs on the server equipment to provide CPU and GPU algorithms support for deep learning to ensure the operational efficiency of vision services.

**2D Camera:**Obtains the 2D images required by the RoboView Server. Includes but is not limited to surveillance cameras, industrial cameras, other consumer-grade web cameras, and USB cameras.

**3D Camera:**Obtains the 3D data required by the RoboView Server. Includes but is not limited to RGBD cameras, structured-light imaging (point cloud), laser cameras, and LIDAR.

A single server can be connected to a variety of different camera types and brands (as shown in the figure, Vision Server 1 can be connected to Camera 1, Camera 2, and the 3D Camera at the same time). Multiple servers can be connected with other systems (such as RoboView GUI and the dispatch system) through a network.

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# Functions and Application Scenarios

## 01 Manufacturing

Visual AI supports load/unload, sorting, moving, stacking, and other production tasks.

**Precise Acquisition**

**Forklift Operations**

**Transportation**



On the production line, RoboView Server can connect to a variety of camera types (laser cameras, etc.) to capture goods in any position within the field of view. Once a 3D point cloud is acquired, recognition and positioning are performed to accurately calculate the item's posture and shape (up to 0.1mm accuracy). This information is then sent to the robotic arm or AMR for precise picking, packaging, forklift, transportation, or specialized tasks such as smart glue application.

RoboView Server can also connect to 2D industrial cameras to photograph items on conveyor belts and use conventional machine vision and deep learning algorithms to complete visual tasks such as sorting, counting, separation, and the filtering of defective goods.

## 02 Management

Storage site, personnel, and integrated AMR  management.

**Storage Site Management**

**Pathing Management**

**Integrated AMR Management**




RoboView Server captures images from surveillance videos in real time, performs target recognition and tracking on personnel, goods, and AMR s, then binds them to specific planning areas to realize decision-making with operational logic. RoboView Server performs real-time analysis of personnel travel routes in task scenarios, trajectories of AMR  routes, and all location statuses in the area, then sends this data to upper-layer systems such as the master control or dispatch system through the standard API to complete higher-level semantic tasks.

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## 03 Safety

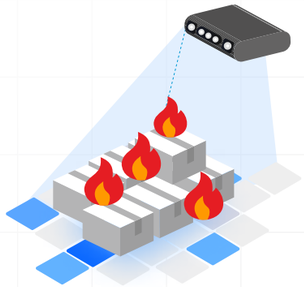
RoboView Server receives real-time video collected through a live camera feed, evaluates the site scenario through different vision algorithms, then sends data to the corresponding dispatch or master control system through the Standard API to ensure the real-time safety of work and production.

### Vision-Guided AMR Obstacle Avoidance



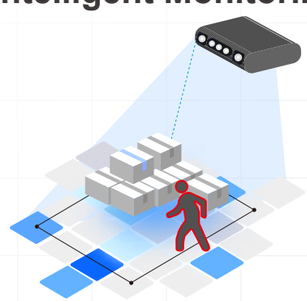
RoboView Server extracts obstacles from images frame-by-frame, accurately identifies their positions, then sends the data to the dispatch system through the Standard API in real time. The dispat ch system then responds rapidly to execute AMR stop, wait, or by pass operations.

### Smart Monitoring of Open Flames



Pre-trained on a deep learning model, RoboView Server is able to identify on-site open flames and divide them into minor, moderate, and severe categories. Real-time data is sent to the master control system through the smart standa rds API, after which the fire extinguisher, alarm syste m, and other equipment are triggered by the master contr ol system.

### Intelligent Monitoring of Foreign Object Intrusion



RoboView server integrates collected 3D point cloud data with 3D recognition algorithms to identify and locate objects intruding onto the designated area, after which the master control system is notified in real time through the smart stand ards API.

## Product Advantages

**True Intelligence**

Advanced vision algorithms remove the need for manual operations, freeing up manpower and reducing deployment demands.

**Flexible Application**

Visual recognition and positioning can be achieved just by adding the target to the database of the vision platform for deep learning, greatly reducing initial investment requirements and shortening the R&D cycle.

**Efficient Manufacturing**

Visual AI solutions effectively reduce the complexity of the manufacturing environment, improve efficiency, and guarantee product quality.

**Stable Results**

Deep learning algorithms ensure high positioning and recognition accuracy is maintained even under chaotic and changing environments.

## Specifications

(The following uses storage site management as an example for basic configurations)

**Server Configuration 1**

| Processor | Graphics Card | RAM | Hard Drive | Operating System |
|---|---|---|---|---|
| AMD Ryzen9 3950x16 Core (32 Threads) | GeForce RTX 2080Ti | 64 GB | 3 TB | Ubuntu 18.04.4.LTS |

| Camera Quantity | Installation Mode | Goods Dimensions / Storage Site Dimensions | Speed | Supported Storage Sites | Server Configuration | Servers |
|---|---|---|---|---|---|---|
| 1 | Looking Down (4.5m height) | 1.5 × 1 × 1.5 / 2.25 × 2.25 | 4 fps | 8x1 | Configuration 1 | 1 |
| 2 | Looking Down (4.5m height) | 1.5 × 1 × 1.5 / 2.25 × 2.25 | 2 fps | 8x2 | | |
| 4 | Looking Down (4.5m height) | 1.5 × 1 × 1.5 / 2.25 × 2.25 | 1 fps | 8x3 | | |
| 1 | Looking Down (6m height) | 1.5 × 1 × 1.5 / 2.25 × 2.2 | 4 fps | 12x1 | | |



**Textile Industry**
One-Stop Intelligent Manufacturing and Smart Logistics Solutions



## There is a Growing Demand for Intelligent Transformation in the Textile Industry

While the Chinese textile industry has great prospects for development, it has been plagued by manufacturing problems such as harsh working environments and high labor intensity requirements. These issues have led to difficulties in recruitment, high employee turnover, high costs, and low efficiency. While textile enterprises urgently require intelligent transformation to save on costs and increase their production capacity, few smart logistics companies have the ability to provide solutions for their complex industry scenarios without altering the original factory environment.

## One-Stop Solution

Utilizing its rich on-site experience and superb product performance, provided Weiyi Holdings Limited with a one-stop logistics solutio n capable of comprehensively resolving pain points; replacing manu al operations through large-scale smart transfer; and realizing transf er between the production line buffer zone and the warehouse, trans portation from the warehouse to the delivery point, and automatic night time warehouse management.

## Solution Layout

- Laser SLAM Mini Automatic Forklift (SFL-MP10S)
- Automatic charging station
- Synergistic Resource Dispatch (SRD)
- Dispatch server
- One-stop implementation tool: Roboshop Pro

## Client Profile

Serving as the workshop of the world, China’s textile industry accounts for 50% of global production, while its chemical fiber production accounts for an even higher 70%. Zhejiang Weiyi Industry Co., Ltd. is a large-scale textile enterprise, primarily engaged in production and processing.

## Challenges

- Two-shift model, 24h continuous operation
- The weight of finished textile products are not uniform, making them difficult to move.
- Site space is narrow, storage is dense, and route planning is complex.
- Harsh working environments and dusty surfaces

## Additional Modifications

Installation of dusters onto the vehicle body helps prevent wheels from getting stuck on debris.
Increase of vehicle rated load in accordance with product quality.

## Solution Highlights

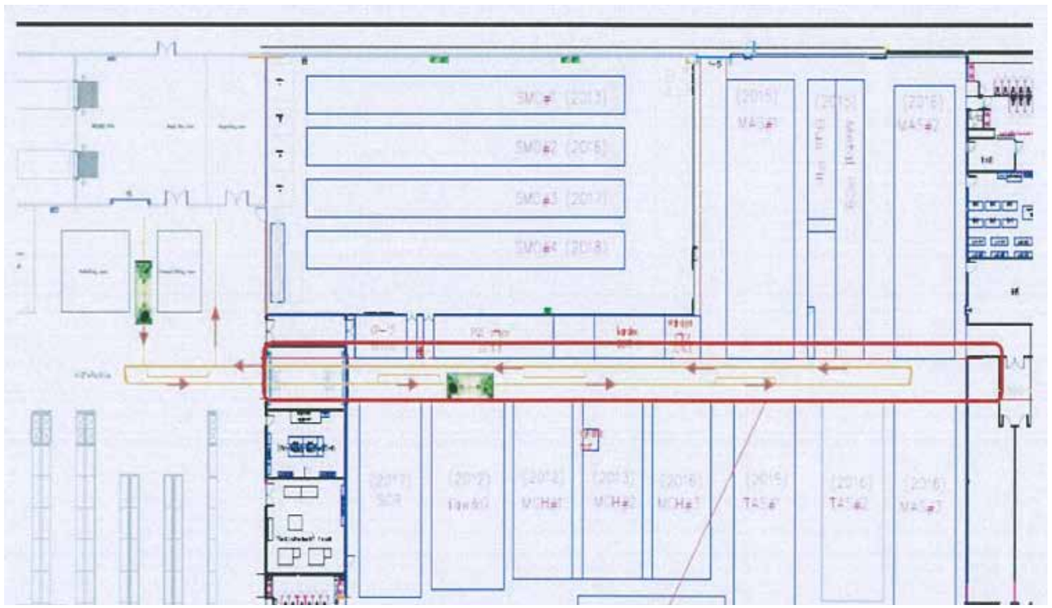
- RDS is deeply integrated with the client’s ERP system to realize collaborative material management and AMR dispatch.
- The software is simple, easy to use, and supports execution via terminal. The ERP allocates store/delivery tasks → an order is placed through PDA code scan → RDS → robot selection → designated robot executes the task.
- Optimal route creation and SEER RDS route management prevents robot deadlocks and realizes two-way transportation across all workstations.
- Smart management, visualization across the entire production process, panoramic display of all factory data, along with timely and efficient site dispatch.
- Automatic night-time inventory greatly improves moving efficiency and saves on manpower.

| 2.5x | 99.99% | 24h |
|---|---|---|
| Moving Efficiency | On-Time Delivery | Uninterrupted Operations |

SEER one-stop solution helped Weiyi Holdings Limited solve the major issues of high labor costs and low moving efficiency that had been plaguing its textile operations. As of present, production line automation and intelligent transformation of the first warehouse have been completed, greatly enhancing production capacity. Weiyi Holdings Limited has noted that its partnership with SEER has exceeded its original expectations for intelligent transformation. The enterprise plans to continue working with SEER to complete the intelligent transformation of its factories and realize intelligent manufacturing across its entire production chain.



**Auto Parts Manufacturing Industry**One-Stop
Intelligent Manufacturing and
Smart Logistics Solutions



## Transformation Requirements of the Automotive Industry

China’s auto parts manufacturing industry is developing rapidly, and serves as a key and labor-intensive component of the overall auto sector. As the traditional production process requires the manual moving of materials, the limited amount of available workshop passageways causes problems in terms of labor mobility, insufficient labor, low efficiency, and potential safety hazards.

## One-Stop Solution

In accordance with the actual site situation, SEER assisted the integrator in automating the client’s workshop logistics through its one-stop solution tailored for the automobile industry. The solution reduced labor costs, eliminated hidden safety hazards, and greatly improved the factory’s logistics and transportation efficiency.

## Solution Layout

- SRC-powered Laser SLAM Transfer Automatic Forklift
- Automatic charging station
- Dispatch server
- One-stop implementation tool: Roboshop Pro

## Client Profile

The client is primarily engaged in the R&D and manufacturing of electronic products and components such as automotive anti-lock braking systems, electronic control units (ECUs), and sensors for driver-assistance systems. While the operational requirements continue to rise and the demand for personnel is increasing, the enterprise’s personnel costs remain high, efficiency is low, and operations are not optimally integrated with the MES. Enhanced workshop automation and intelligence are urgently required.

## Challenges

The laser sensor used for navigation is installed at a high position, and it is difficult to detect an obstacle in a low position.

## Additional Modifications

An additional laser scanner was added at a low elevation along with 2 sets of photoelectric sensors on the fork tip to improve safety in a comprehensive manner.

## Solution Highlights

- The software is simple and easy to use, removing the need for long and costly training periods.
- provides a comprehensive alert mechanism to ensure safety during transportation. The software can be used to delimit an area to reduce robot speed s and prevent high-speed collisions.

Realizes obstacle detection by the automatic forklift to ensure the safety of personnel and goods during operations.

- Features a comprehensive safety training mechanism to ensure the safety of integrated man-machine operations.
-

| 2 x | 99.99% | 24 h |
|---|---|---|
| Increased Efficiency | On-Time Delivery | Uninterrupted Operations |

The use of AMRs to replace manual operations has freed up manpower, greatly reduced labor costs, and reduced the management costs of workshop personnel; improved the logistics and transportation efficiency of warehouses and workshops, along with further enhancing production efficiency; and effectively integrates with the MES to realize workshop automation and intelligence.

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**Household Chemicals Industry**

One-Stop Intelligent Manufacturing and Smart Logistics Solutions




## Transformation Requirements of the Household Chemicals Industry

With the coordinated development of China's regional economies and the rapid growth of the Internet and service industries, the manufacturing industries of the Yangtze River Delta and Pearl River Delta regions have experienced severe labor shortages. Difficulty in recruitment is continuing to rise along with labor costs. The FMCG industry is labor intensive, requiring large numbers of personnel to deal with huge production batches. Increasing labor shortages and rising costs have created an urgent demand for intelligent transformation in the industry.

## One-Stop Solution

In accordance with the actual site situation, SEER assisted the integrator in automating the client's packaging and production lines through its one-stop solution tailored for the household chemicals industry, thereby realizing smart transportation between packaging lines. The solution enabled robots to automatically transport labeled boxs of personal care products from the labeling line to the printing workshop.

## Solution Layout

- AMB-powered Roller Robot
- Automatic charging station
- Synergistic Resource Dispatch (SRD)
- Dispatch server
- One-stop implementation tool: Roboshop Pro

## Client Profile

The client is a leading global enterprise primarily engaged in the R&D, manufacturing, and sales of personal care products, cleaning products, cosmetics, health foods, and other FMCGs, with annual revenue in excess of CNY 10 billion. In the packaging workshop in the modern production center of the client's South China headquarters, the transfer of materials between production lines was originally handled by human personnel. The large volume of goods and high personnel requirements led to high costs and created an urgent demand for improved workshop logistics automation.

## Challenges

- Production lines require a large amount of AMRs to complete transportation tasks. Workshop passageways are narrow, and integrated man-machine operations are required.

## Solution Highlights

- RDS perfectly integrates with the client's MES to realize materials management, along with AMR dispatch and coordination. The solution supports the unified dispatch and deployment of hundreds of AMRs and the optimal job allocation to ensure the most suitable AMRs are dispatched to complete transportation tasks.
- The software is simple and easy to use. MES allocates store/delivery tasks → an order is placed through PDA code scan → RDS → robot selection → designated robot executes the task.
- Optimal route creation + RDS route management
- provides a comprehensive alert mechanism to ensure safety during transportation. The software can be used to delimit an area to reduce robot speed s and prevent high-speed collisions.
- Features a comprehensive safety training mechanism to ensure the safety of integrated man-machine operations.

The replacement of manual moving operations with AMRs has greatly reduced labor costs and mitigated the problems caused by difficulties in personnel recruitment and labor mobility. The efficiency of logistics and transportation has been improved, workshop automation and intelligence have been enhanced, and errors caused by manual operations have been reduced.