



**Integrated Intelligent Logistics Solutions**  
**Global Pioneer in Full-Category Automated Loading & Unloading**

ATLS + INTEGRATION

**AI-Powered Intelligent Logistics Solutions Provider**



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ENGOAL | 2026





# About Engoal

COMPANY INTRODUCTION

## ENGOAL

Engoal is a global pioneer in full-category automated loading and unloading and a professional provider of intelligent logistics and smart manufacturing solutions. With “ATLS + Integration” as our core strategy, we deliver end-to-end services from solution planning and core equipment development to software integration, project implementation and lifecycle support.

ONE

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# Company Profile

ENGOAL

## Engoal

As a global pioneer in full-category automated loading & unloading, ENGOAL delivers integrated smart logistics and manufacturing solutions. Built on AI-driven robotics and a dual “ATLS + Integration” strategy, we offer one-stop services — from planning and core equipment manufacturing to software deployment and full-cycle support. Beyond solving dock-level bottlenecks, we streamline the entire material flow — from unloading and warehousing to picking, handling, and production distribution — empowering global manufacturers and logistics providers to accelerate digital transformation.

## Mission

Integrate AI & robotics to redefine industrial productivity.

## Vision

Lead the industrial robotics revolution,  
unlocking infinite value for global production.

## Core Values

Deliver excellence for customers; grow together with our team.



■ 100+ Hardware and Software Patents ■ 50% R&D Staff Ratio ■ 15% Annual Sales Growth ■ 300+ Successful Project Implementations ■ 100% Delivery Guarantee



# Core Team Leadership



**Leo Chen | CEO**

Over 20 years of professional experience in intelligent logistics.

Former Vice President of Sales at CIMC Tianda, and Deputy Vice President of Sales at Damon. Served as consultant for multiple globally-renowned enterprises, with extensive industry insights in e-commerce and factory operations.

## Jeffrey Guo

Vice President

Over 20 years of experience in intelligent logistics.

Previously responsible for overseas market development at leading companies including TGW and Damon.

## Jay Wang

Head of Product

Over 10 years of experience in logistics equipment R&D and management.

Previously worked at Honeywell and Dematic, and participated in the development of Honeywell's automatic unloading robot.

## Longcheng Li

Head of Vision Algorithms

Long-term focus on computer vision and full-process visual perception development. Led the development of Transformer-based architecture design, enabling the application of foundation models in industrial logistics scenarios. Dedicated to building world-model systems with scene understanding, physical reasoning and long-term prediction capabilities.

## Aoxiang Jiang

Head of Model Development

Completed a direct-entry Ph.D. program at USTC, with joint doctoral training at Durham University. Specialized in physics-based modeling and simulation algorithms, with deep expertise in AI, world models, industrial simulation, and precision inspection.

## Huifang Kong

Senior Technical Expert

Professor and Ph.D. Supervisor, and a leading scholar in Pattern Recognition and Intelligent Systems. A recognized expert in artificial intelligence, autonomous driving, world models, and intelligent manufacturing. Senior Member of IEEE, with more than 40 national, provincial, and ministerial-level research projects led as principal investigator.



## R&D Center & Manufacturing Base

### Rooted in China, Empowering Global Industries

#### ➤ Technology-Driven Innovation

Integrated capabilities across R&D, intelligent manufacturing, software development, and product validation.

#### ➤ Integrated Capability Network

R&D centers, software development teams, and intelligent manufacturing bases work together as one system.

#### ➤ Reliable Global Delivery

Standardized production, efficient project execution, and lifecycle support ensure consistent delivery worldwide.



- Focused on core technology development, product validation, and system testing.



- Developing ILMP, control systems, and digital solutions for intelligent logistics operations.



- Supporting precision manufacturing, assembly, and delivery of intelligent logistics equipment.



- Equipped with standardized production and testing capabilities to ensure reliable global delivery.

# Automated Loading & Unloading Products & System Integration Capability

ENGOAL



## Manufacturing & Integration Facilities

- 20,000+ m<sup>2</sup> manufacturing facilities
- Supports equipment production, system integration and project delivery
- Manufacturing presence in Suzhou and Zhejiang



## Standardized Manufacturing Capability

- Standardized production and assembly processes
- Supports both ATLS and integrated solutions
- Enables efficient and scalable project delivery



## System Commissioning & Testing

- Multiple simulation and testing zones
- Equipment validation and system integration testing before delivery
- Scenario-based commissioning for complex operating conditions



## Global Compliance & Delivery Capability

- Compliance with CE, ETL and regional standards
- Supports projects across Europe, Southeast Asia, North America and other markets
- Standardized quality control for global deployment



CONFORMS TO



CE Certification  
(Mandatory EU  
Safety Standard)



*From Product Development to System Integration and Global Delivery*



# Global Footprint

ENGOAL

*With offices and branches across key economic regions worldwide, we deliver professional, localized support to our global customers*



# Company Milestone

ENGOAL

## 2016-2017

- **Engoal (Beijing) Intelligent Technology Co., Ltd. established**
- Signed 13 consecutive Amazon warehouse automation retrofit projects
- Engoal's first truck-retrofit automated loading/unloading product launched

## 2018-2019

- **Secured tens of millions RMB in Series A financing; Suzhou headquarters established**
- First automated loading/unloading product deployed at SAIC and replicated at Volkswagen, Bosch and other leading automakers

## 2020-2021

- **Expanded overseas and launched our international strategy and set up overseas branches**
- First fork-rail automated loading/unloading system for FMCG deployed; initial model validated technical feasibility
- **Vision R&D team established**

## 2022-2023

- Product portfolio expanded to 7 series and 12 scenario-specific applications
- **Entered the new energy sector and deployed benchmark solutions with leading enterprises**

## 2024-2025

- Automated loading/unloading products widely deployed at leading lithium battery factories
- **Products exported to Southeast Asia, Europe, North America and South America**
- Self-developed AI algorithms, adaptive control and autonomous-driving interfaces lay the groundwork for future expansion

## 2026

- **Zhejiang manufacturing base completed for standardized production and scaled delivery**
- Evolved the AI + Hardware + Scenarios roadmap, upgraded the product portfolio and expanded into additional overseas markets



# Patents, Honors & Certificates

ENGOAL

## Innovation Strength · Global Compliance · Industry Recognition

Recognized for strong R&D capabilities, international certifications, and proven industry expertise

200 +

Intellectual Property Rights

Multiple Industry Awards

Industry Recognition

CE · ETL · UL

International Certifications

National High-Tech Enterprise

Innovation Qualification

### Qualifications



### Honors





# End-to-End Global Service & Support

ENGOAL

*Comprehensive lifecycle support from project initiation to long-term maintenance*



## Pre-Sales & Consulting

- Tailored Solution Design
- Feasibility Studies
- Technical Proposal



## Project Implementation

- Project Management
- Seamless Installation
- System Commissioning
- Power & Network Integration



## Compliance & Certifications

- Permit Acquisition
- Certification Support
- Regulatory Compliance



## After-Sales & Maintenance

- On-Site Service
- Spare Parts Supply
- 24/7 Technical Support
- Preventive Maintenance



*We ensure your investment delivers sustained value with reliable, responsive, and professional service every step of the way*



# Customer Recognition

100+

Delivered Projects Worldwide

With extensive cross-industry experience,

We have become a trusted automation partner for leading enterprises across multiple sectors



E-commerce&3PL



Lithium Battery



Automotive



Beverage



FMCG



Electronics



Chemical Industry

**CATL**  
宁德时代

**EVE**

**HTHIUM**  
海辰储能

远景能源  
ENVISION

**BOSCH**

**BYD**

**CHERY**

**Volkswagen**

蒙牛

泸州老窖

**Unilever**  
联合利华

亚马逊  
amazon.cn

**muRata**  
INNOVATOR IN ELECTRONICS

**EMERSON**

**C**  
Cnauque

**法士特**

**BASF**  
The Chemical Company

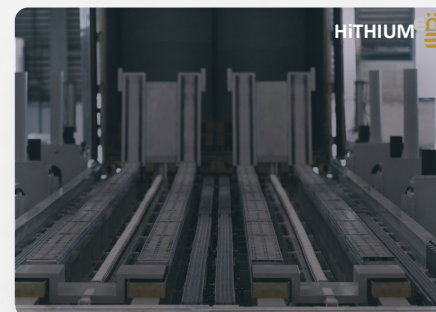
**TOLEAD**

**SAGW**  
上汽变速器

**日日顺**

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**ENGOAL**



HITHIUM



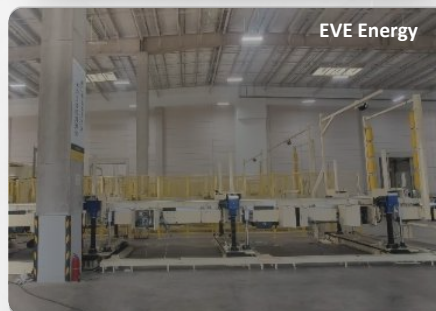
Air Cargo Terminal



CATL



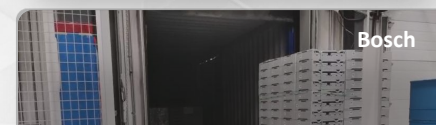
Unilever



EVE Energy



Murata Electronics



Bosch



AOI

02

# Engoal Solution

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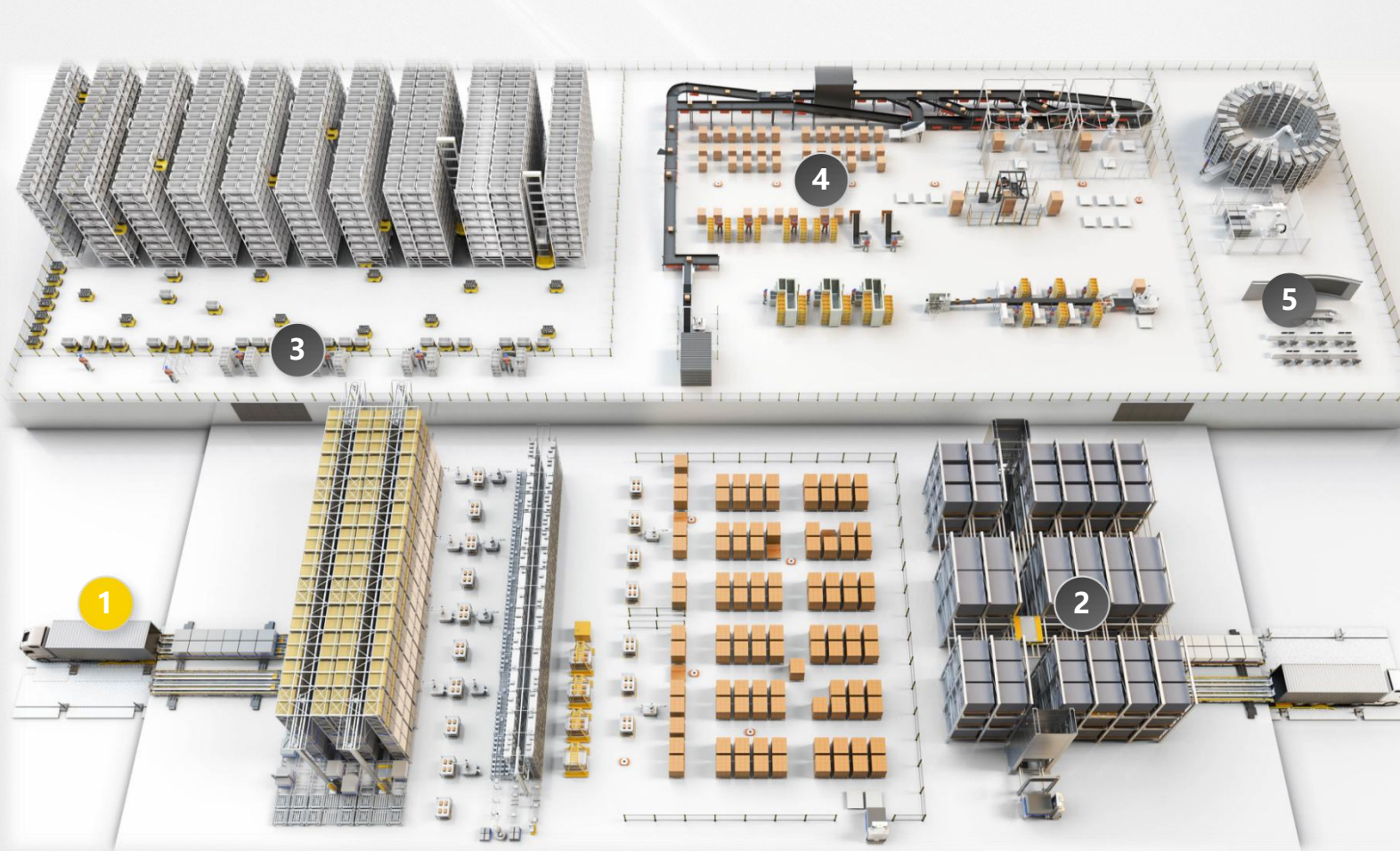
Based on real operational scenarios, ENGOAL combines proprietary automated loading and unloading solutions with intelligent system integration capabilities. From Messol and Pallsol to warehousing, conveying, robotics, software platforms, and third-party equipment, we deliver end-to-end solutions that connect equipment, systems, and business processes across the entire logistics flow.



# End-to-End Intelligent Logistics Solution



*We connect planning, storage, handling, picking, loading and software systems to enable seamless end-to-end logistics operations*



1

## Automated Loading & Unloading

- Proprietary loading & unloading equipment and control systems
- Automated inbound and outbound operations for faster vehicle turnaround

2

## Intelligent Storage System

- Planning, design and integration of intelligent storage systems
- Supports AS/RS, shuttle systems, miniload and other storage solutions

3

## Intelligent Picking System

- Intelligent picking, sorting and replenishment solutions
- Integrated with storage and software systems for efficient order fulfillment

4

## Intelligent Material Handling System

- Flexible handling across production and warehouse scenarios
- Integration of AGV/AMR, conveyors and robotic handling equipment

5

## Intelligent Management System

- Integration of WMS, WCS, ILMP, ERP/MES and control platforms
- Enables real-time coordination of equipment, inventory, tasks and operations

*From automated loading and storage to handling, picking and digital management, ENGOAL delivers integrated solutions tailored to real operational scenarios*

# Industry Trends & Automation Opportunities

*Loading & Unloading Remains One of the Last Major Gaps in Logistics Automation*



2 % +



## Workplace Injury Risk

- Reported injury rates in loading and unloading operations can exceed 2%, highlighting the safety risks associated with highly manual operations.
- High labor turnover and physically demanding working conditions further increase operational uncertainty and management costs.

≥ 35 °C + ≥ 30 kg



## Stricter Safety & Compliance Requirements

- Regulations and occupational safety standards are increasingly restricting prolonged manual operations in extreme temperatures and confined loading environments.
- Heavy cartons and repetitive manual handling increasingly require mechanical assistance or automated handling solutions.
- Policy trends across major markets continue to accelerate the transition toward safer and more automated loading and unloading operations.

30 % +



## Rising Labor Cost Pressure

- Manual handling remains a major contributor to logistics operating costs.
- High labor dependency creates strong demand for automation, efficiency improvement and cost reduction.



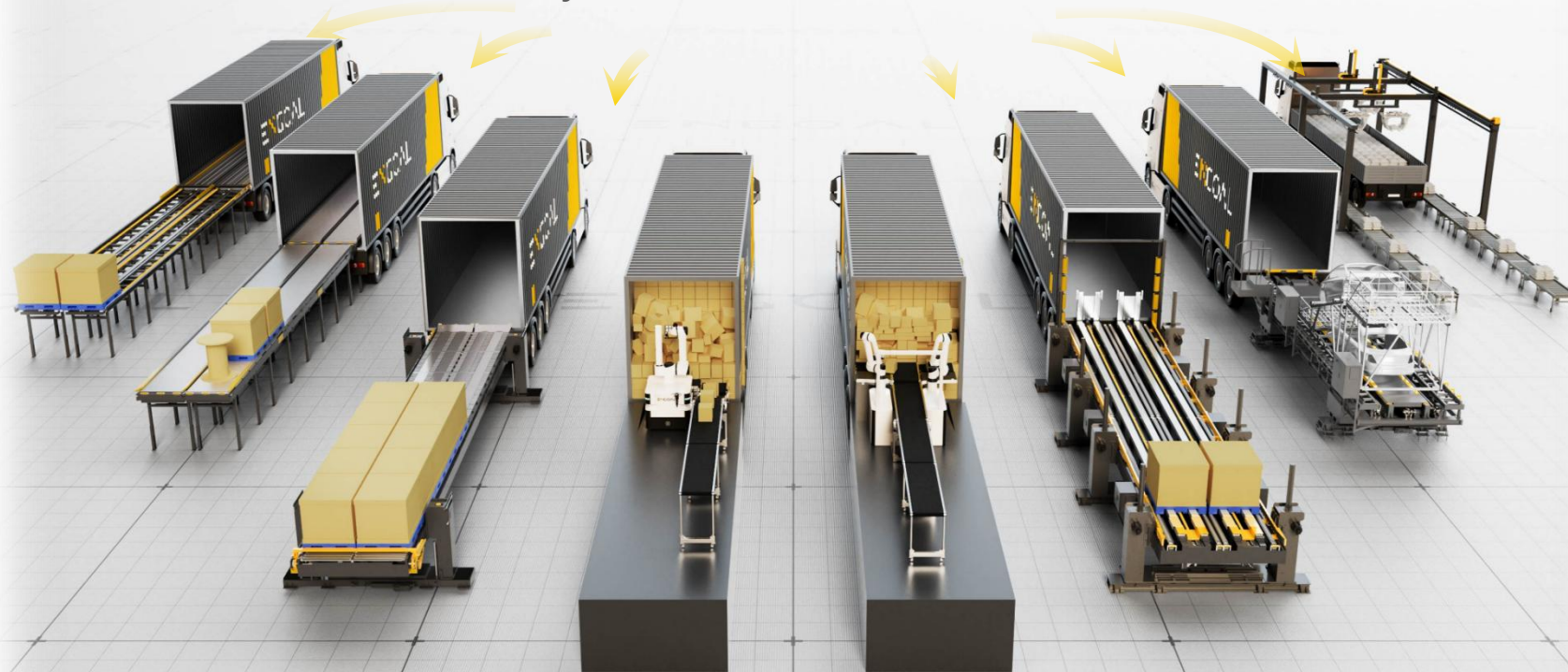
# Core Proprietary Automated Loading & Unloading Solutions

ENGOAL

*Eight proprietary solutions covering pallets, loose cartons, bagged goods and other cargo types*

*Powered by AI, machine vision and motion control for flexible vehicle docking and automated loading/unloading*

Powered by "AI + Machine Vision + Motion Control"



## Labor Cost Reduction

- Reduce staffing from 7 operators to 1
- Up to 72% lower labor requirements



## Higher Operating Efficiency

- Manual operation: 30–45 min
- Automated operation: as fast as 6 min

6

45 MIN



## Higher Dock Utilization

- Reduce truck waiting and turnaround time
- Dock utilization can reach nearly 100%



## Break Through Throughput Bottlenecks

- Dock capacity increased by 65%
- Overall operating efficiency improved by 84%

# Core ATLS Product Portfolio



Pallet-ATLS

## Pallet Automated Loading & Unloading System

- **Cycle Time:** 5–10 min/truck
- **Rated Payload:** Up to 30 tons
- **Labor Saving:** Replaces 6–8 operators per system
- **Key Advantage:** Proven across multiple palletized logistics scenarios, with interfaces reserved for future autonomous vehicle integration



Efficiency Champion



Carton-ATLS

## Carton Automated Loading & Unloading System

- **Throughput:** 800–1,500 cartons/hour
- **Rated Payload:** Up to 40 kg/pick
- **Labor Saving:** Replaces 3–5 operators per system
- **Key Advantage:** Designed for complex mixed-carton scenarios, with flexible handling of cartons and soft packages in the same operation



Flexibility Champion



Bulk/Bag-ATLS

## Bag Automated Loading & Unloading System

- **Cycle Time:** 40–60 min/truck
- **Rated Payload:** Up to 50 kg/gripper
- **Labor Saving:** Replaces 3–5 operators per system
- **Key Advantage:** AI-enabled recognition and handling for heavy bags and irregular bulk materials



Payload Champion

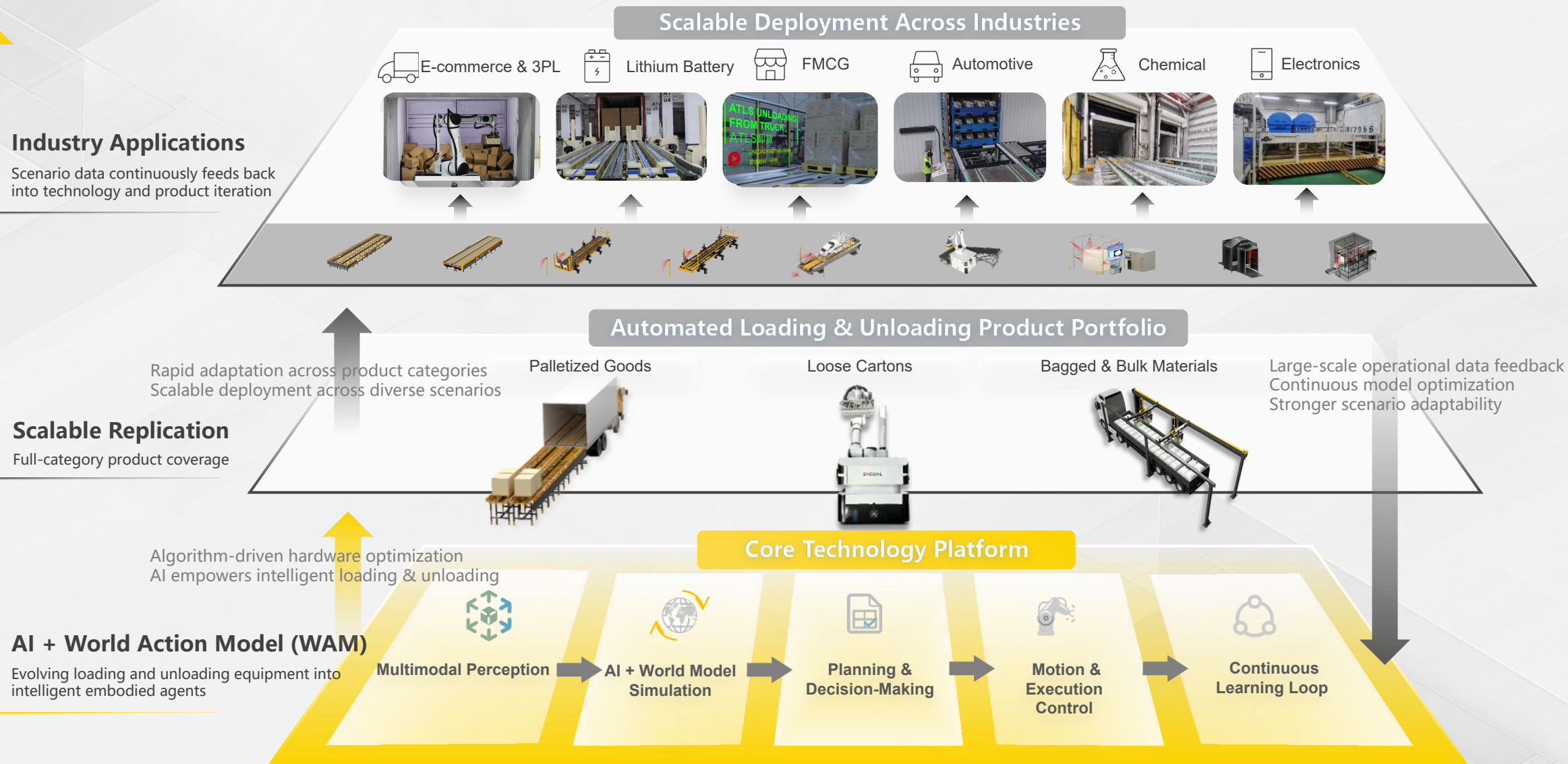




# Technology-Driven Product Framework



*From Core Products to Scalable Industry Applications — Powered by AI, Hardware and Data*



# 2.1

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## Messol Series

TWO

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MESSOL is ENGOAL's AI-powered robotic unloading solution for loose cartons and soft packages. Combining machine vision, intelligent perception and adaptive motion control, it can identify, plan and execute unloading tasks in complex mixed-load scenarios, delivering flexible, efficient and safer automated loading and unloading for real-world logistics operations.



# Messol Series

## Embodied Intelligent Unloading Robot Adaptive Automation for Complex Cargo Handling

Designed for real-world unloading challenges, Messol combines AI vision, robotic control and intelligent mobility to automate complex carton unloading operations.

With adaptive recognition, flexible gripping and autonomous navigation, Messol enables efficient and reliable unloading for mixed-size cartons and unstructured cargo scenarios.

**Intelligent Recognition & Positioning**

**Adaptive Handling for Various Cargo Types**

**SLAM Navigation & Smart Docking**

**AI Vision**

**Flexible  
Gripping**

**Autonomous  
Mobility**



**ENGOAL**



**AI Vision**

**Recognition**



**Flexible Gripper**

**Handling**



**SLAM Navigation**

**Autonomous Operation**



# Messol-S

Built for Mixed-Carton Handling





# Messol Series Specifications

ENGOAL



## Basic Configuration



- **Dimensions:** 1260 × 1060 × 2180 mm
- **Robot Arm Reach:** 2000 mm
- **Rated Payload:** 40 kg
- **Navigation:** SLAM Autonomous Navigation

## Cargo Capability



- **Applicable Cargo:** Cartons
- **Carton Size:** 100–700 mm
- **Compatible Vehicles:** 20ft / 40ft Containers & Trucks

## Performance



- **Throughput:** 800–1200 cartons/hour
- **Mobility:** Omni-directional Driving
- **Runtime:** 8 hours continuous operation

## Gripping System



- **Vacuum Suction Gripper**
- Independent suction control
- Adaptive gripping zones
- Multi-carton handling capability



# Core Technologies for Messol

ENGOAL

*AI Vision + Adaptive Control · Enabling Intelligent Perception, Decision and Execution*

## Dual 3D Vision System

### ● Intelligent Perception

- RGB + Depth Data Fusion
- Precise Cargo Recognition
- Dynamic Picking Position Calculation

## Intelligent Motion Control

### ● Autonomous Operation

- SLAM Navigation
- Omni-directional Movement
- Dynamic Path Planning

## Adaptive Gripping Technology

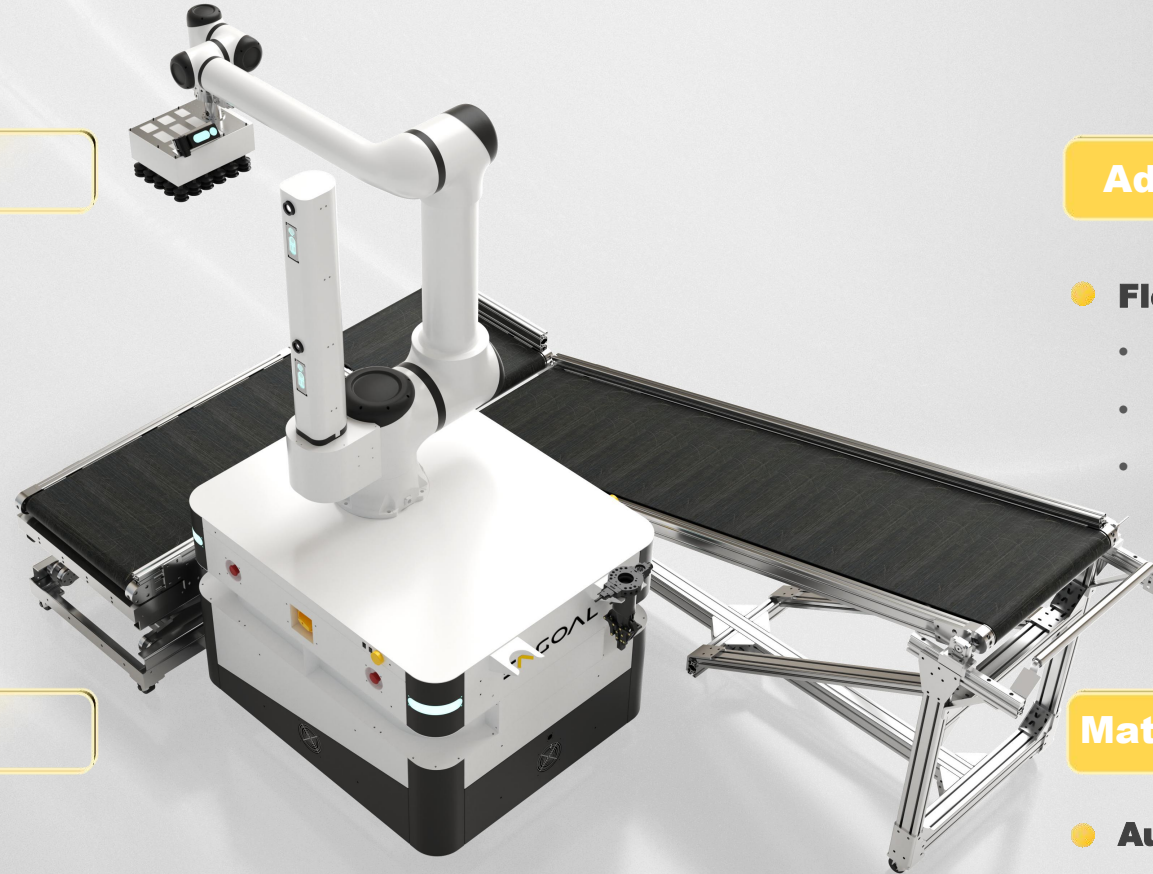
### ● Flexible Handling

- Independent Suction Control
- Multi-size Carton Adaptation
- Multi-piece Picking Capability

## Material Tracking & Safety Control

### ● Autonomous Operation

- SLAM Navigation
- Omni-directional Movement
- Dynamic Path Planning





# Building Logistics Intelligence Through AI, World Models and Robotics



*Proprietary data from extreme real-world scenarios trains vertical-domain AI models, feeding back into the equipment*

## Real-World Deployments Across Leading Industries Scaled Data Assets

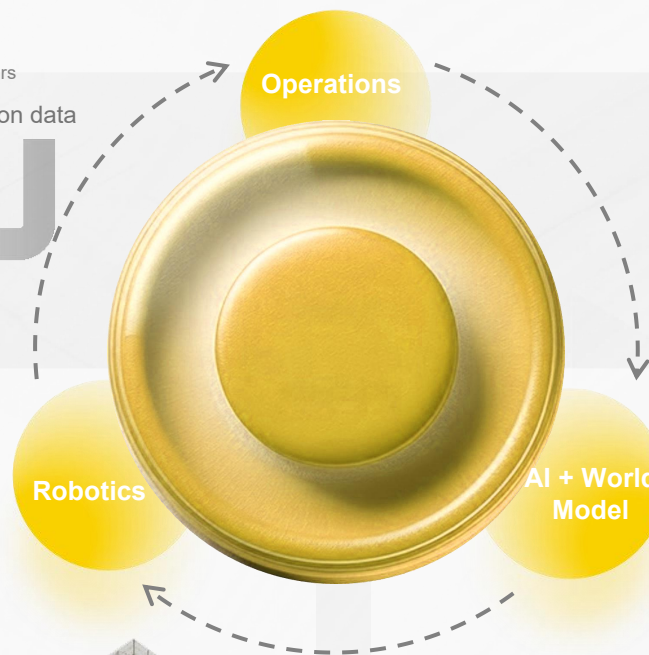
**1million+** hours  
Pallet operation videos

**100K+** hours  
Manual unloading videos

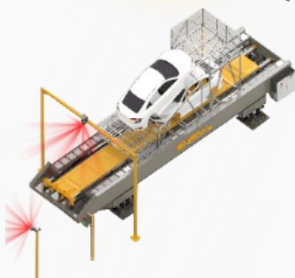
**10K+** hours  
Robot operation data

Over 1 Trillion  
Logistics Scenario  
Latent Tokens

Millions of Real and Simulated Logistics Scenarios...



- Dexterous hand + Wheeled chassis → Flexible scenarios
- Heavy mechanical structure → Ultra-heavy scenarios
- Multi-scenario docking → Future expansion



## AI + WAM Model

### AI-Powered World Model

Robust Performance in  
Complex Conditions... ..



Collapsed Loads

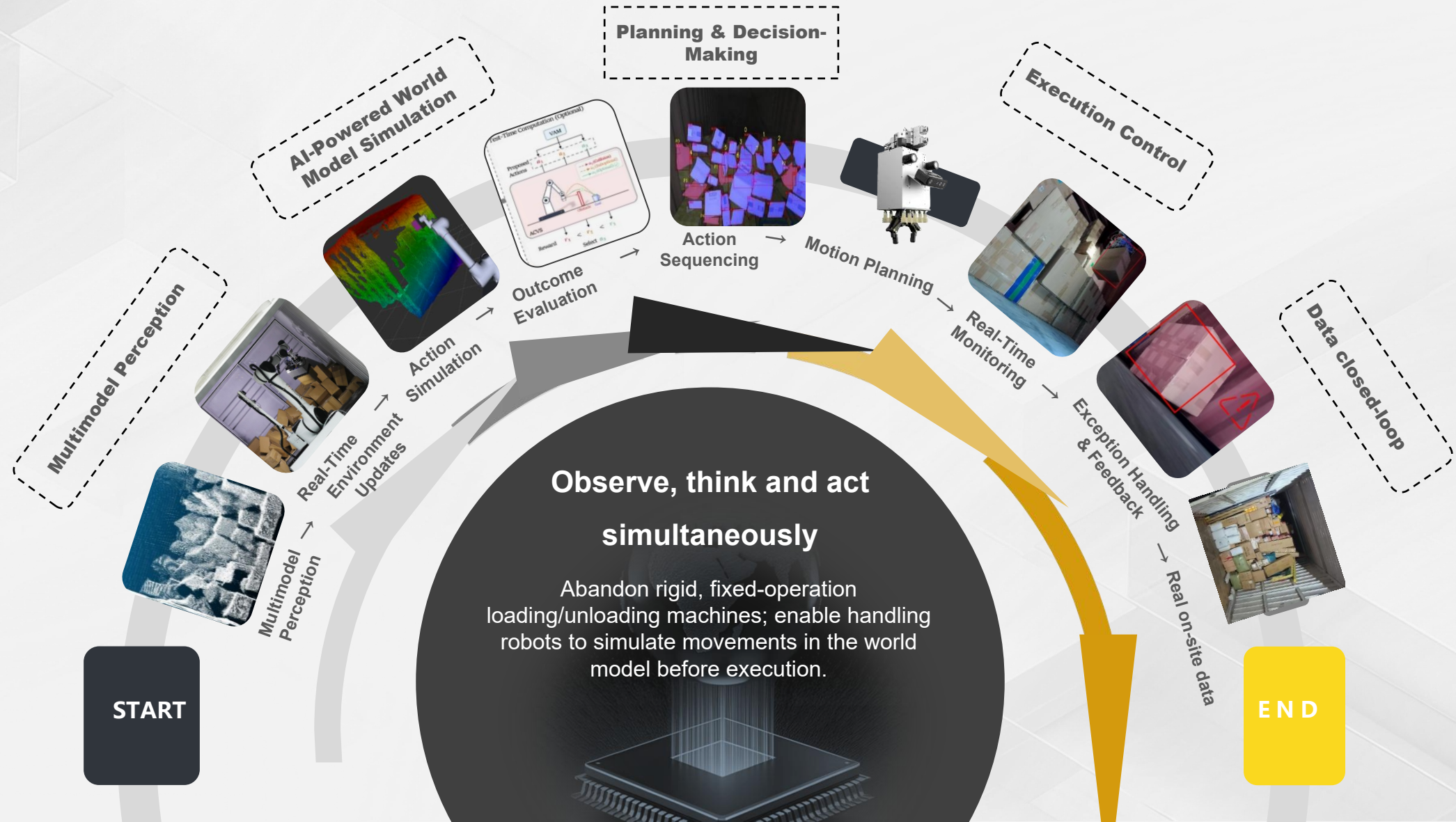


Mixed / Irregular Cargo

# How AI Powers Intelligent Loading & Unloading Operations



*From Rule-Based Automation to AI-Driven Decision Making for diverse cargo types and complex logistics environments*





# 2.2

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## Pallsol Series

TWO

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PALLSOL is ENGOAL's automated loading and unloading solution for palletized goods. Designed for efficient truck-to-warehouse operations, it enables fast vehicle docking, automated loading/unloading and seamless connection with conveyors, AS/RS and warehouse systems across diverse industrial scenarios.



# Pallsol Series

ENGOAL

## High-Speed Automated Pallet Loading & Unloading System Intelligent Automation for Palletized Cargo Handling

Pallsol is designed for high-efficiency palletized cargo loading and unloading scenarios, enabling fully automated operations for trucks, containers and logistics hubs.

With flexible mechanical structures, intelligent positioning and multiple deployment configurations, Pallsol provides reliable automation solutions for diverse pallet handling requirements.

**Rapid Loading & Unloading**

**High Efficiency**

**Multiple System Configurations**

**Flexible Deployment**

**Large Payload Capability**

**Heavy-Duty Handling**







***New Energy Industry***  
***Automatic Truck Loading & Unloading System***



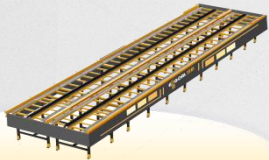
**HTHIUM**  
海 辰 儲 能

**&**

**ENGOAL**

# Pallsol Series Specifications

One platform, multiple configurations — optimized for different logistics scenarios



## **Pallsol-SC**

**Slide Chain - ATLS**

Retrofit

Loading & Unloading

3-run pallets, 4-way pallets,  
plastic pallets, metal containers

Tailored Solution

4-6min

Max 1T/Pallet



## **Pallsol-PP**

**Push Plate - ATLS**

Retrofit

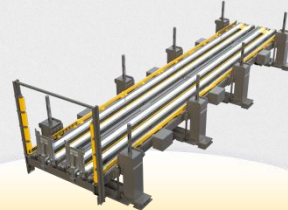
Loading & Unloading

Various pallets/racks  
(Mixed loading allowed)

Tailored Solution

8-12min

Max 1.5T/Pallet



## **Pallsol-RF**

**Fork Rail - ATLS**

Non-Retrofit

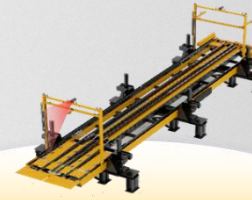
Loading & Unloading

4-way pallets, 9-leg pallets

Trailer Length+2500mm

12-15min

Max 1.5T/Pallet



## **Pallsol-CC**

**Chain Conveyor - ATLS**

Non-Retrofit

Loading-Only

Various pallets/racks  
(Mixed loading allowed)

Trailer Length+2500mm

4-6min

Max 1T/Pallet



## **Pallsol-TT**

**Tow Type - ATLS**

Non-Retrofit

Unloading-Only

Custom metal body fixtures

Length 1400mm

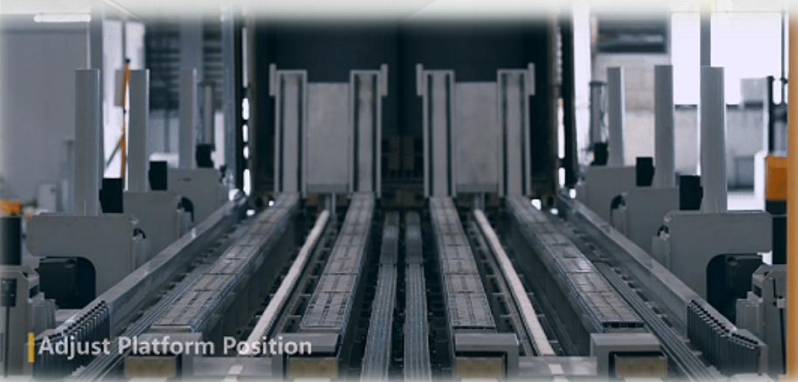
8-10min

Max 2.8T/Pallet

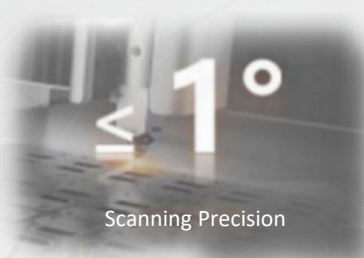
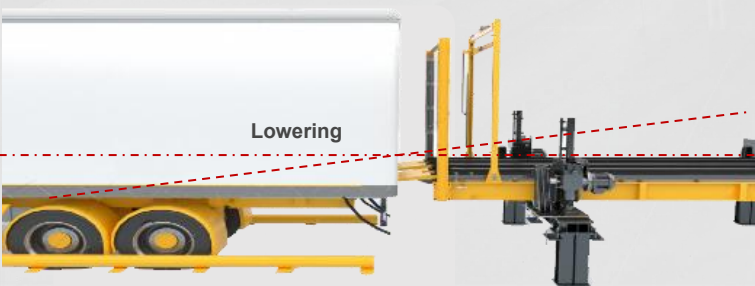


# Core Technologies for Pallsol

ENGOAL



- **Fork Rail**
- Lift stroke 0-600mm
  - Horizontal displacement  $\pm 300\text{mm}$
  - Rotation  $\pm 1^\circ$



Scanning Precision

1.5T/m

Heavy load capacity

-15-60°C

Resists corrosion  
high & low temperatures

15 s

Scanning Time

## ➤ **Airbag Sealing Technology**

Airbag lifting on the fork rail creates a compact structure with even force distribution and shock absorption. Segmented air curtains reduce equipment lifting and venting time to only **90 s**

### Intelligent Vehicle Positioning Laser + Sensor Fusion

- Vehicle position detection
- Automatic alignment
- Accurate docking control

### Flexible Mechanical Structure Scenario-Based Design

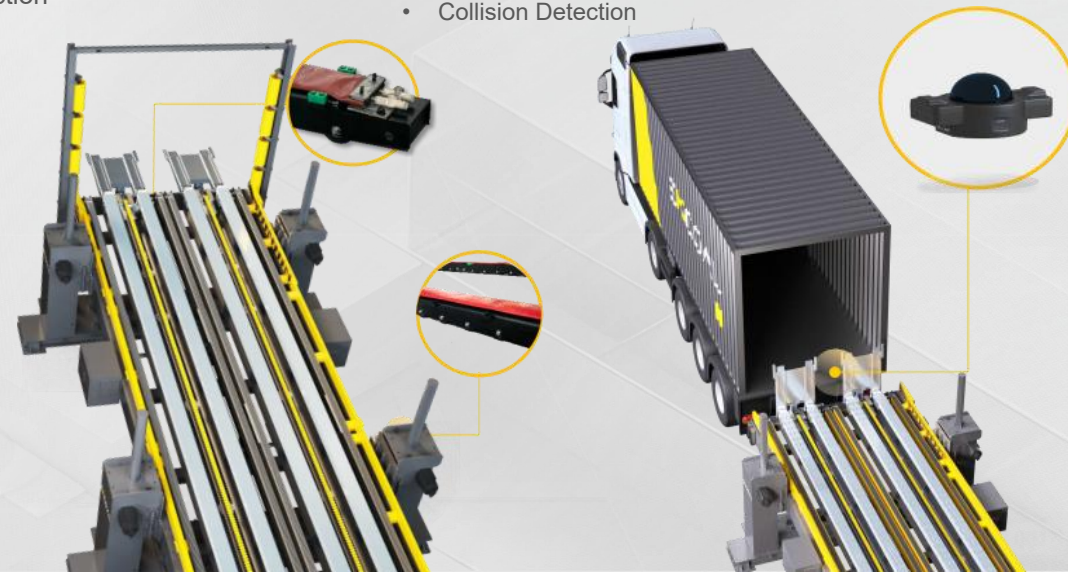
- Fork Rail
- Chain Conveyor
- Slide Chain
- Push Plate
- Tow Type

### Adaptive Alignment Technology Automatic Cargo Adjustment

- Height adjustment
- Horizontal displacement
- Angle correction

### Intelligent Safety System Reliable Automated Operation

- Safety Fence
- Light Curtain
- Emergency Stop
- Collision Detection



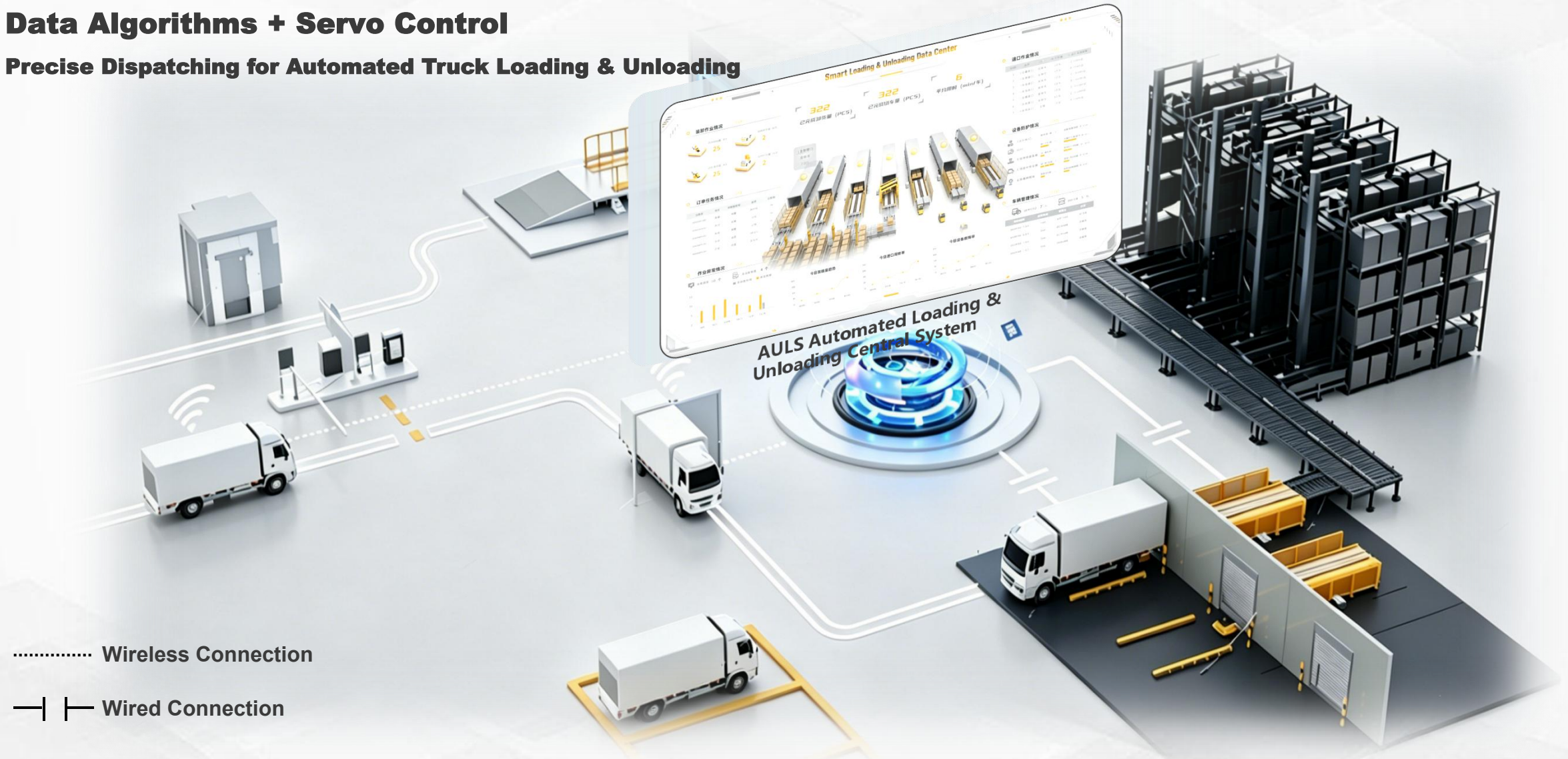


# Truck Digital Dispatching Center Powered by AI Models

ENGOAL

**Data Algorithms + Servo Control**

**Precise Dispatching for Automated Truck Loading & Unloading**





03

# System Integration

THREE

ENGOAL integrates proprietary equipment, third-party automation systems and digital software platforms into unified intelligent logistics solutions. By connecting WMS, WCS, ERP/MES, AGV/AMR, storage, conveying and loading/unloading systems, we enable seamless coordination across the entire logistics flow.



# ENGOAL

## AIR CARGO TERMINAL SYSTEM





# System Integration

ENGOAL

*Connecting equipment, software and operations into one integrated intelligent logistics system*

## Electrical & Automation Control

PLC programming, electrical design and equipment control integration  
Safety interlocking, system commissioning and on-site optimization

## Supply Chain Management

Procurement coordination, supplier management and quality control  
Delivery planning and cross-functional resource coordination

## WMS / WCS Software

Warehouse management, task scheduling and equipment coordination  
Integration with ERP, MES, AGV/AMR and other automation systems

## Solution Design

Process analysis, logistics planning and data-driven simulation  
Layout optimization, capacity planning and ROI evaluation

## Project Management

Standardized project execution from installation to acceptance  
Schedule, quality, safety and lifecycle service management

Engoal

# Digital Logistics Control & Intelligent Scheduling Platform

ENGOAL

**Connects equipment, logistics and production systems to digitize and coordinate the entire industrial logistics process**

Engoal uses the intelligent logistics management platform, WMS, WCS, MES and equipment control systems to digitally manage the full flow from material receiving, storage and handling to production delivery and finished-goods dispatch





# Intelligent Storage Systems



Built around high-speed stacker cranes and four-way shuttle systems to deliver high storage density, high efficiency and intelligent operations



## Labor Cost Advantage

Traditional manual warehousing requires 4-6 people for receiving, inventory counting and storage. Intelligent storage requires only 1 operator. Labor cost is 20% of the traditional approach, saving 80%



## Storage Efficiency Advantage

Manual retrieval of a single pallet takes about 8-12 minutes; intelligent storage completes the full put-away and retrieval cycle in 2 minutes

2min

8-12min



## Break the Efficiency Bottleneck

24/7 lights-out operation; overall warehouse throughput rises 70%, and order response efficiency reaches 90%



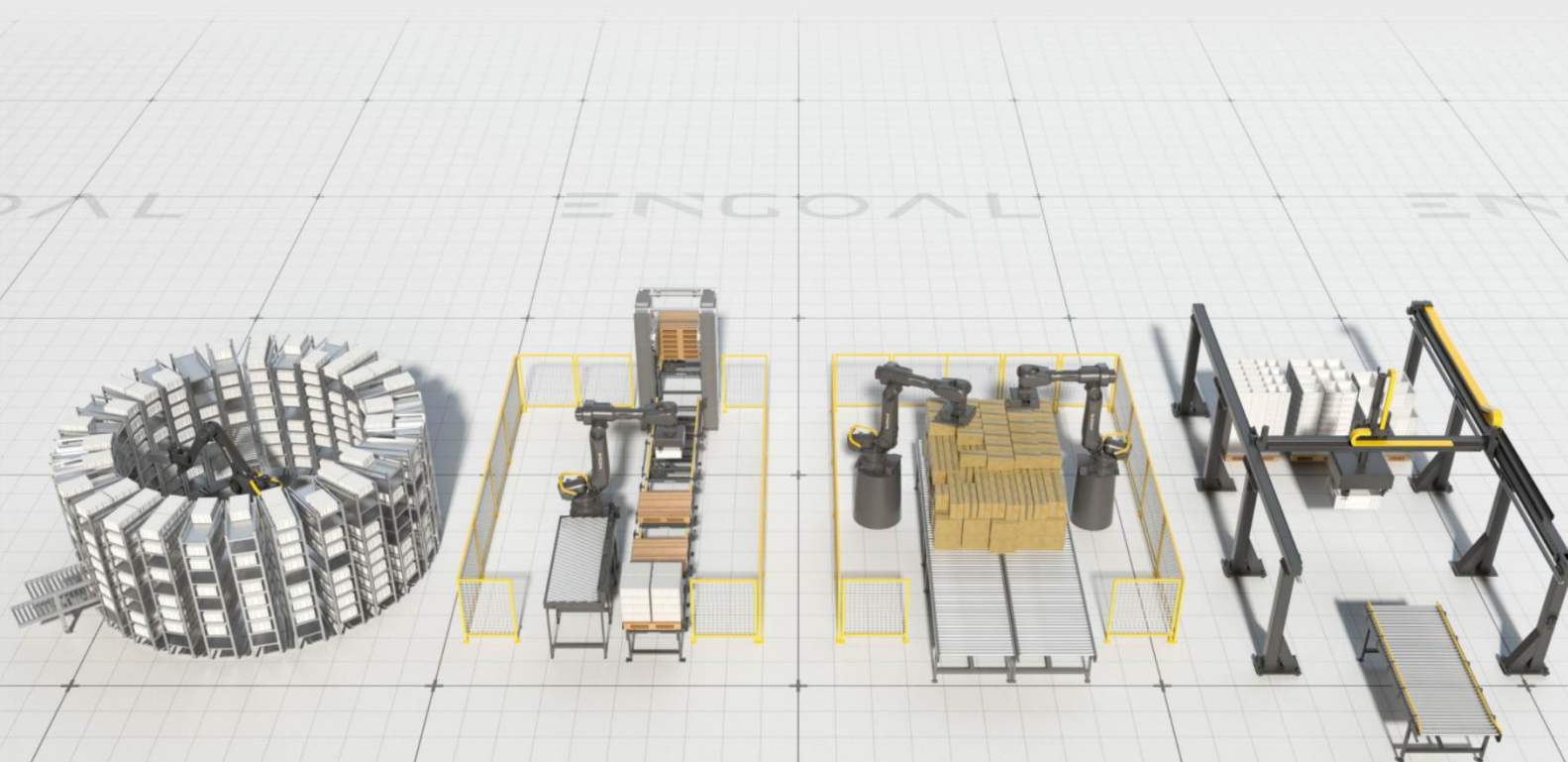
## Increase Storage Density by 80-500%

Covers 0.35m-12m of three-dimensional storage space

# Picking Workstation Series



Composed of robotic arms, vision algorithms and intelligent end effectors for automated sorting and palletizing scenarios



## Labor Cost Advantage

Traditional manual picking requires 4-6 people for order splitting, picking and verification. Intelligent picking requires only 1 operator. Labor cost is 25% of the traditional approach, saving 75%.



## Efficiency Advantage

Manual picking is time-consuming and labor-intensive. Intelligent workstations simplify workflows, shorten cycle time per item, improve overall efficiency by 60% and reduce labor intensity by 65%.



## Picking Accuracy

Manual picking error rates are about 0.3%-0.5%. Intelligent workstations achieve 99.99% accuracy, significantly reducing mis-shipments and missed items.



## Break the Efficiency Bottleneck

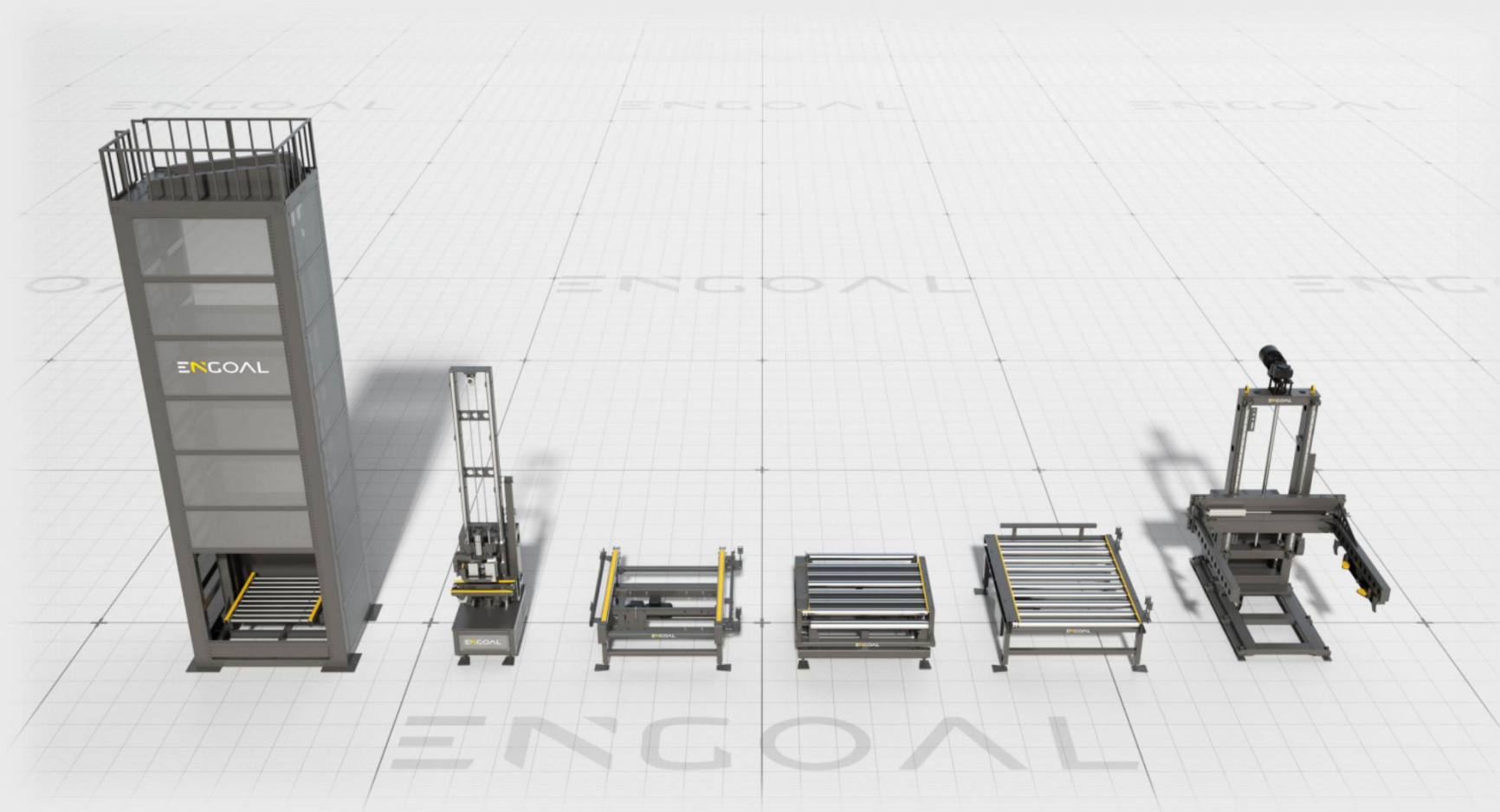
Supports parallel processing of multiple orders, lifting overall picking efficiency by 60% and order fulfillment efficiency to 92%, effectively resolving the bottlenecks of manual picking.



# Automated Conveyor Systems



Customized conveying equipment including high-speed lifts, conveyors, transfer units, RGVs and more



## Operating Efficiency Advantage

Manual transfer is slow and poorly synchronized. These conveyor systems support continuous, uninterrupted operation, increasing overall flow efficiency by 70% and ensuring smoother material handoffs.



## Space Adaptability Advantage

Compact structure and flexible layouts support complex scenarios with height differences and multi-path turns. Space utilization increases by 35% versus traditional conveying.



## Flexible Customization Advantage

Compact structure and flexible layouts support complex scenarios with height differences and multi-path turns; space utilization increases by 35% versus traditional conveying.



## O&M and Cost Advantage

Stable operation and low failure rates reduce manual transfer positions; combined labor and O&M costs decrease by 55%, enabling long-term stable operation.

04

# Case Studies

CUSTOMER SUCCESS STORIES

ENGOAL has delivered intelligent logistics solutions across automotive, new energy, electronics, 3PL, FMCG, chemical and other industrial sectors. Through proven project execution and continuous scenario validation, we turn advanced technologies into scalable solutions that create measurable operational value for customers.

THREE



# Clients Are Building the Future With Our "New Tools"

ENGOAL

## Unilever's Automated Truck Loading Breakthrough

Making Best seller  
Fulfillment Even Faster

Unloading time < 5 min

ATLS UNLOADING  
FROM TRUCK  
ATLS卸货

UNLOADING TIME < 5 MIN

卸货时间 < 5分钟



# Clients Are Building the Future With Our "New Tools"

ENGOAL

## Mengniu Logistics Park's "Minute-Level" Revolution

Daily loading/unloading efficiency increased by

5-6x



High Automation

Automated loading/unloading + AS/RS



Ultra-High Efficiency

40min→6min

20%

Annual Energy Consumption

¥173K/Year

Loading/Unloading Opex



# Clients Are Building the Future With Our "New Tools"

ENGOAL

## Luzhou Laojiao's "10-Minute Miracle" Revolutionizing Logistics Speed in the Alcohol Industry

### High Flexibility

Dual-mode operation: Fully automatic production line + human-machine collaboration, ensuring uninterrupted supply chain with "smart backup".

↓ 80%

Product Damage Rate



**Clients Are Building the Future With Our "New Tools"**

**ENGOAL**

**CATL-Automating the **Final Mile** of Inbound/Outbound Logistics for "Extreme Manufacturing"**

**High Compatibility**

Supports multiple truck types

**Ultra-High Efficiency**

Full truck loading completed in 15 minutes





# Clients Are Building the Future With Our "New Tools"

ENGOAL

## Hithium Energy Storage: Automated Unloading for Safe, Efficient U.S. Operations

Building a secure and efficient supply chain foundation for its U.S. base



Multi-Equipment Integration



Safety Certified

Labor Savings

**5** FTEs

Annual Cost Reduction

**¥2.5M**

# Los Angeles Digital Air Cargo Terminal Processing Center



## ■ Customer Type

- 3PL - Air Cargo Logistics Hub

## ■ Project Location

- North America - Los Angeles

## ■ Project Scope

- AGV goods-to-person and buffer-sorting lights-out warehouse
- 700 AMR buffer storage locations
- 4 Gaylord unpacking stations
- 3 PMC depalletizing stations

## ■ Key Components

- RCS / AMR / P3 barcode scanning & dimensioning workstation / Gaylord unpacking workstation / PMC buffer

## ■ Project Highlights

- End-to-end AI vision tracking
- Throughput of 300 tons/day, 3x the capacity of a manual warehouse
- Gaylord unpacking at 170 cartons/hour, doubling efficiency



- *Planned capacity: 400 tons/day; buffer capacity: 300 tons*



# DFW Digital Air Cargo Terminal Processing Center

ENGOAL



- **Planned capacity: 150 tons/day; buffer capacity: 100 tons**

## ■ Customer Type

- 3PL - Air Cargo Logistics Hub

## ■ Project Location

- North America - Dallas

## ■ Project Scope

- Intelligent depalletizing + AGV goods-to-person and buffer-sorting lights-out warehouse
- 300 AMR buffer storage locations
- 2 Gaylord unpacking stations
- 2 PMC depalletizing stations
- 3 robotic mixed-palletizing workstations

## ■ Key Components

- RCS / AMR / P3 barcode scanning & dimensioning workstation / Gaylord unpacking workstation / PMC buffer / conveyor sortation / robotic mixed-palletizing workstation

## ■ Project Highlights

- End-to-end AI vision tracking
- Throughput of 150 tons/day, 3x the capacity of a manual warehouse; headcount reduced by 12
- Gaylord unpacking at 170 cartons/hour, doubling efficiency



# New York Digital Air Cargo Terminal Processing Center

ENGOAL



- *Daily throughput: 300 tons; 3x the capacity of a manual warehouse*

## ■ Customer Type

- 3PL - Air Cargo Logistics Hub

## ■ Project Location

- North America - New York

## ■ Project Scope

- AGV goods-to-person and buffer-sorting lights-out warehouse
- 600 AMR buffer storage locations
- 4 Gaylord unpacking stations
- 3 PMC depalletizing stations

## ■ Key Components

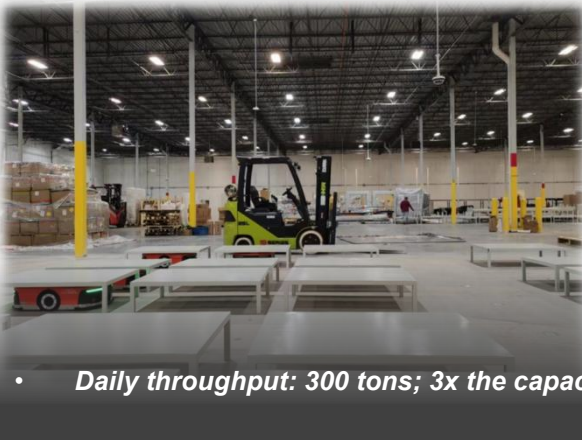
- RCS / AMR / P3 barcode scanning & dimensioning workstation / Gaylord unpacking workstation / PMC buffer

## ■ Project Highlights

- End-to-end AI vision tracking
- Throughput of 300 tons/day, 3x the capacity of a manual warehouse
- Gaylord unpacking at 170 cartons/hour, doubling efficiency



# ORDI Digital Air Cargo Terminal Processing Center



- *Daily throughput: 300 tons; 3x the capacity of a manual warehouse*



## ■ Customer Type

- 3PL - Air Cargo Logistics Hub

## ■ Project Location

- North America - Chicago

## ■ Project Scope

- Intelligent depalletizing + AGV goods-to-person and buffer-sorting lights-out warehouse
- 430 AMR buffer storage locations
- 5 Gaylord unpacking stations
- 2 PMC depalletizing stations
- 6 robotic mixed-palletizing workstations

## ■ Key Components

- RCS / AMR / P3 barcode scanning & dimensioning workstation / Gaylord unpacking workstation / PMC buffer / conveyor sortation / robotic mixed-palletizing workstation

## ■ Project Highlights

- End-to-end AI vision tracking
- Throughput of 300 tons/day, 3x the capacity of a manual warehouse; headcount reduced by 12
- Gaylord unpacking at 170 cartons/hour, doubling efficiency

# ORDII Digital Air Cargo Terminal Processing Center



• *Daily Throughput: 400 tons/day; 3x the capacity of a manual warehouse*



## ■ Customer Type

- 3PL - Air Cargo Logistics Hub

## ■ Project Location

- North America - Chicago

## ■ Project Scope

- AGV goods-to-person and buffer-sorting lights-out warehouse
- 2,000 AMR buffer storage locations
- 5 Gaylord unpacking stations
- 3 PMC depalletizing stations

## ■ Key Components

- RCS / AMR / P3 barcode scanning & dimensioning workstation / Gaylord unpacking workstation / PMC buffer

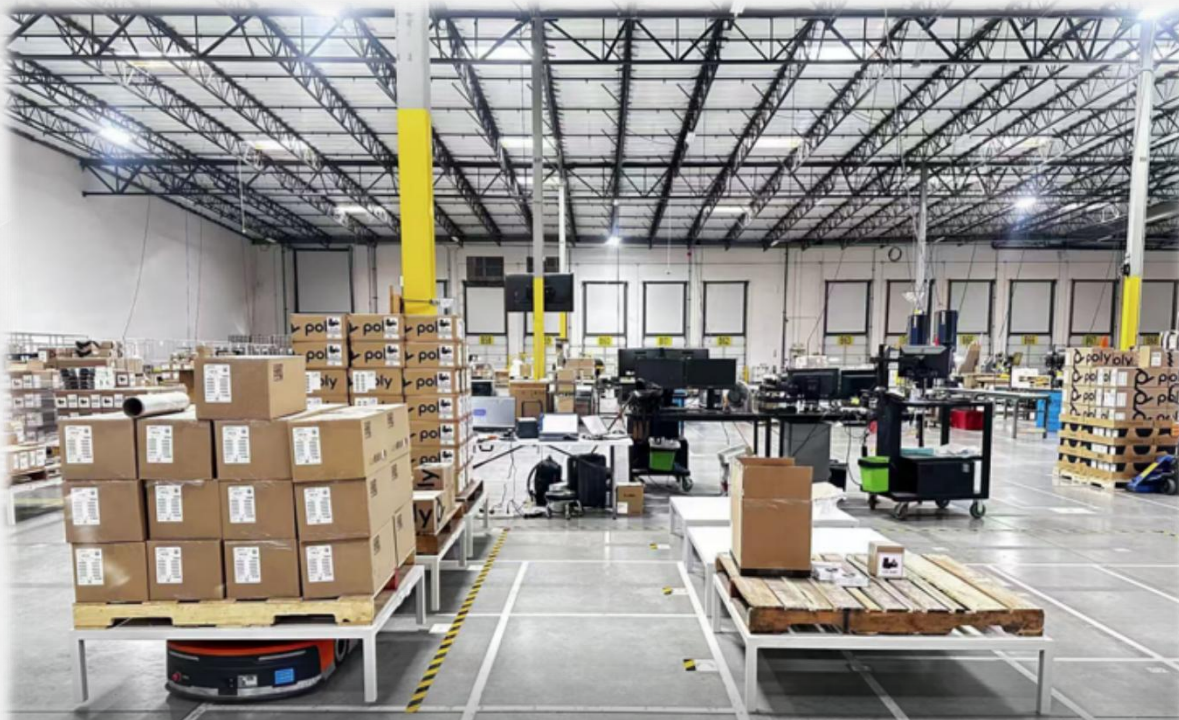
## ■ Project Highlights

- End-to-end AI vision tracking
- Throughput of 400 tons/day, 3x the capacity of a manual warehouse
- Gaylord unpacking at 170 cartons/hour, doubling efficiency



# GXO Goods-to-Person Picking & Handling Project

ENGOAL



*GXO Logistics is a leading global contract logistics provider, delivering B2B warehousing, picking, distribution and integrated supply chain outsourcing for world-class enterprises including HP and Poly. Through goods-to-person AGVs, voice picking, pick-to-light and intelligent sortation, GXO builds benchmark automation pilots that continuously improve order fulfillment, inventory accuracy and overall supply chain performance through digital operations and intelligent equipment.*

## ■ Customer Type

- 3PL - B2B

## ■ Project Location

- North America - Los Angeles

## ■ Project Scope

- Goods-to-person picking lights-out warehouse
- Pick-location replenishment based on inventory and production; replenishment completed at the inbound workstation
- Order-driven pallet delivery to the picking workstation; supports simultaneous picking and sortation for 3 B2B/B2C orders
- Picked order pallets move through QC and packing, then to the outbound station and forklift buffer
- AMR returns empty pallets to the buffer area; daily SKU inventory counting is completed at the workstation

## ■ Key Components

- RMS / RCS / AMR / Picking Racks / PTL Pick-to-Light Racks

## ■ Project Highlights

- Manages the piece-picking area independently of GXO's order system
- Supports multiple B2B orders in parallel; 2x manual picking efficiency
- Inventory accuracy improves by 30%, reaching 99.9%





# **“AI Vision + Adaptive Control”**

## **Redefining Intelligent Handling Ecosystems**

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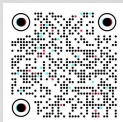
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