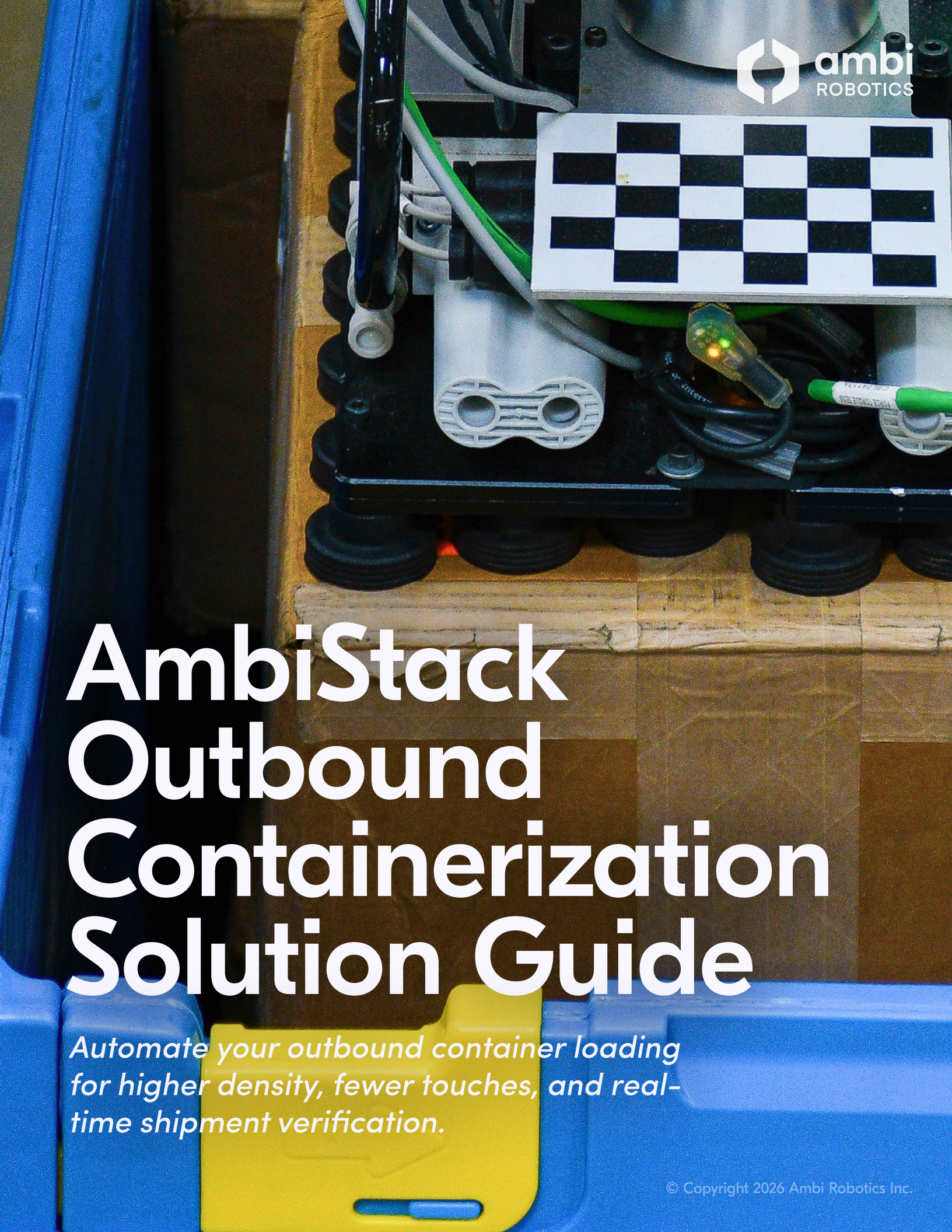


AmbiStack Outbound Containerization Solution Guide

Automate your outbound container loading for higher density, fewer touches, and real-time shipment verification.

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Don't pay to ship air.

AmbiStack is a multi-purpose AI-powered robotic stacking system that automates your outbound container loading for higher density, consistent results, and full shipment visibility. One machine loads to many containers, plans every placement in real time, and verifies what ships.



One flexible solution. For every container you load.

Load to many

Each gantry services a large sorting area, supporting up to 12 pallet-sized containers or six double-pallet-sized containers within a single system.

No prior knowledge required

The model optimizes from the items inside the machine. No advance data and no item ordering.

Flexible containers

Load roller carts, cages, wire containers, gaylords, foldable cages, totes, pallet boxes, and more.

High-density loading

Powered by CARGO, a physical AI reasoning model trained with Sim2Real reinforcement learning to reach container density above 70%.

Built to verify

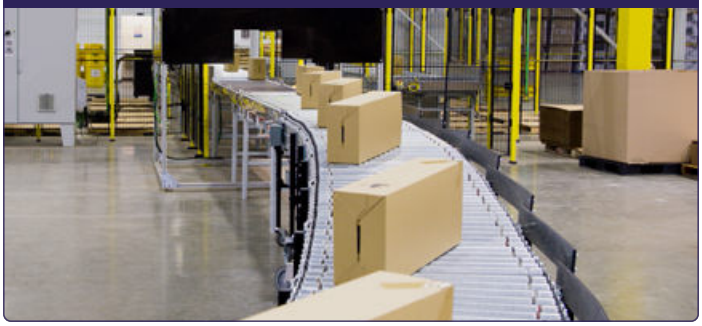
Scan items or integrate with your sorter to confirm every unit. Know exactly what shipped, in real time.

Continuous operation

Independent safety zones let operators swap full containers while the gantry keeps loading.

How it works.

1. Convey items



Existing conveyance, chutes from a primary sorter, or manual induction brings items to AmbiStack.

2. Singulate and scan



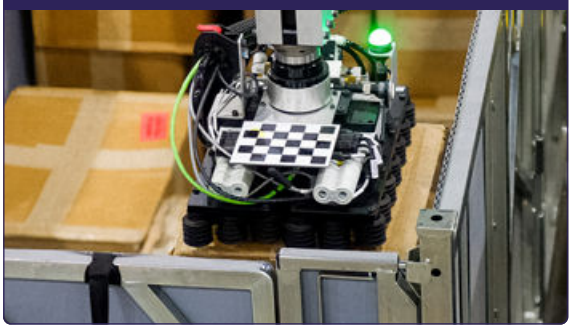
Items are separated, then scanned and dimensioned in the scan tunnel. Alternatively, AmbiStack can receive scan information directly from the upstream sorter.

3. Transfer via central conveyor



AmbiStack's multi-zone conveyor enables denser container stacking by closing gaps between packages and increasing the number of items available for the algorithm to evaluate for each placement.

4. Pick and load



A suction-based gripper places each item into the correct container, optimizing for density, stability, and placeability.

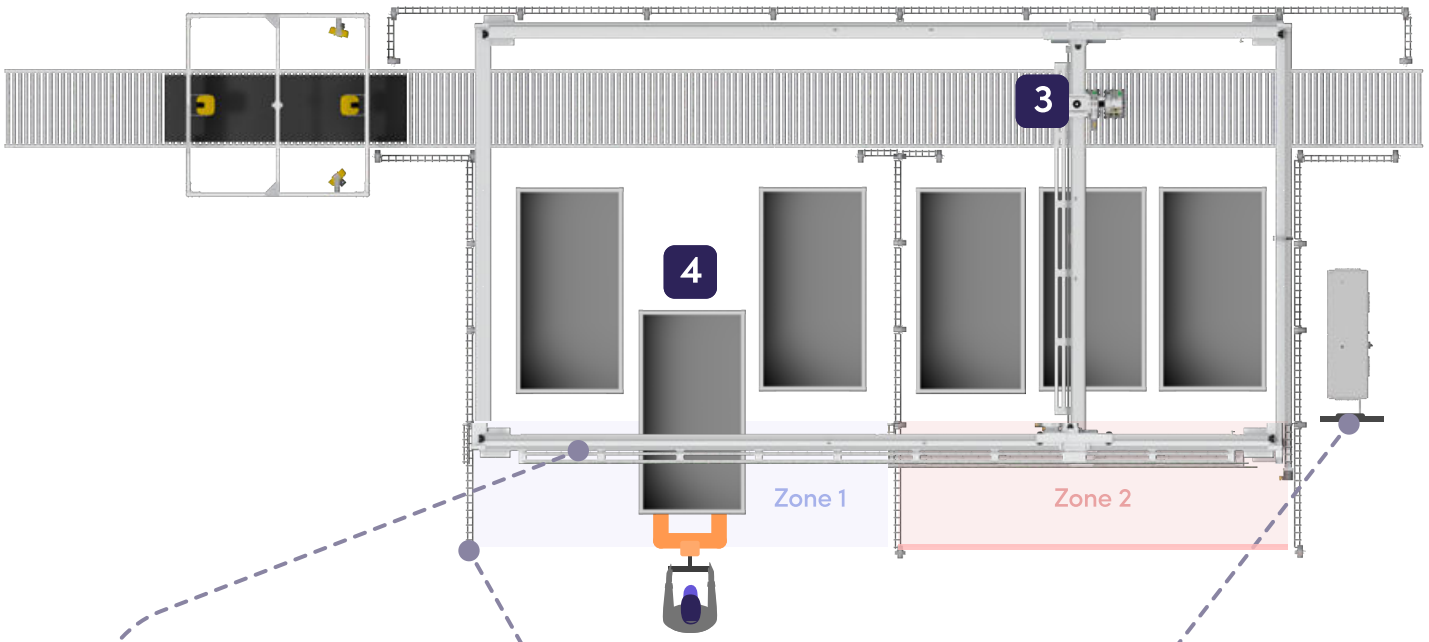
5. Verify and re-plan

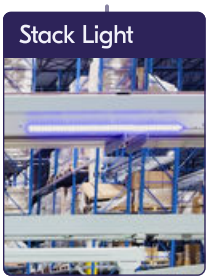




After every placement, AmbiStack images the container to plan the next placement based on the actual position of each item, while simultaneously planning the placement that follows to keep the system in continuous motion.

Operator Interaction







1 HMI and stack light indicate a full container.



2 The operator goes to zone 1 and presses the button to request entry.



3 The gantry moves to zone 2 and continues sorting.



4 The operator walks through the light curtain, removes the full container, and places an empty one.

5 The operator resets the safety system for zone 1, then presses the button to resume full operation.

All-in-one solution

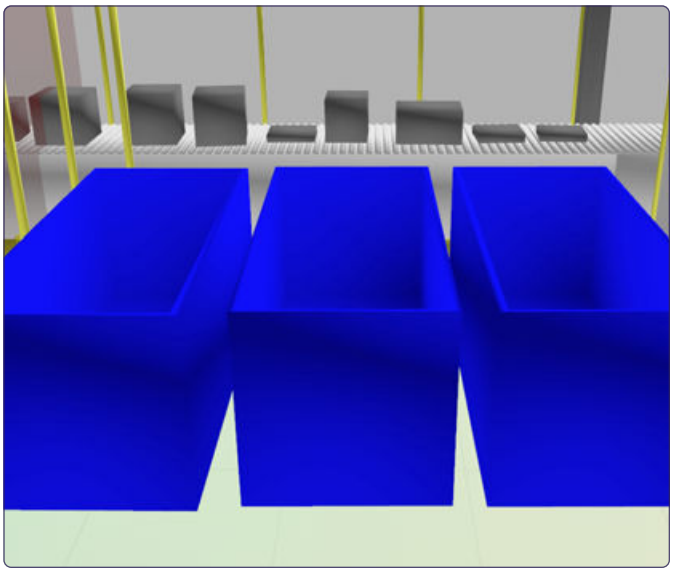
1 Flexible configurations and stacks to various container types



AmbiStack's gantry architecture enables one system to sort and stack across a wide range of container types and locations, including carts with tall side walls, pallets, and directly on the floor. This flexibility helps AmbiStack fit into existing facilities and adapt to different outbound workflows as needs change.

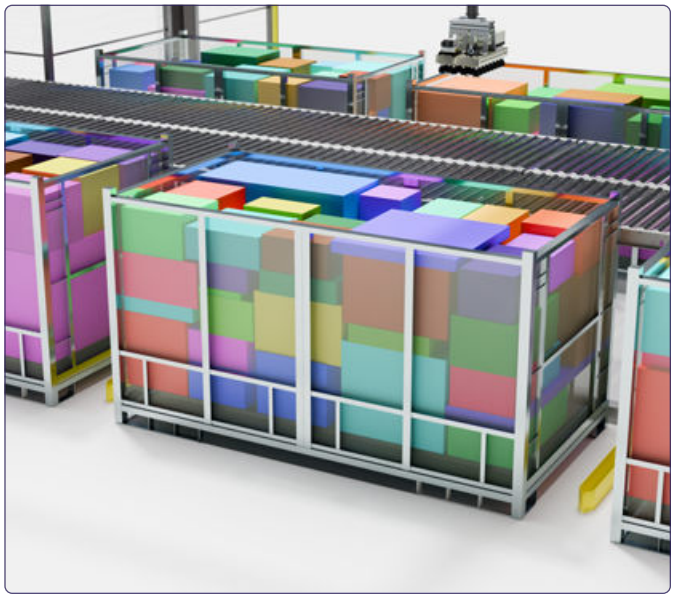
2 Vision-based container registration

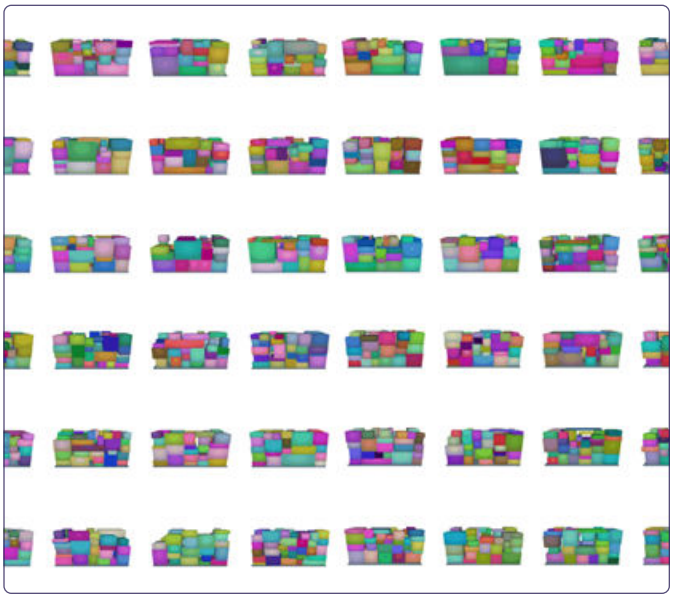




Place carts inside the corner markings. The vision system finds each container and determines its exact position and rotation. Different container types are identified on the fly.

3 AI container loading for maximum density

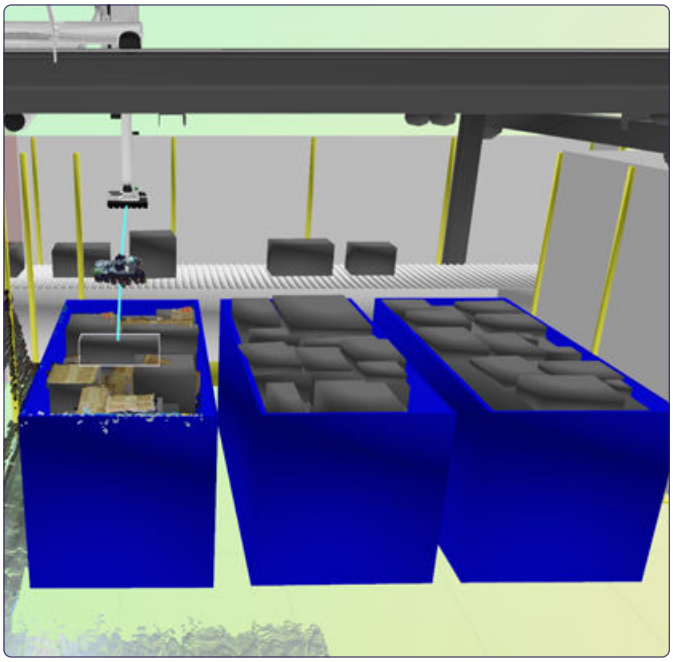




AmbiStack leverages CARGO, an agentic physical AI model, to autonomously pack mixed-SKU containers using Sim2Real reinforcement learning. It optimizes for density, stability, and placeability with no prior item sequencing. Production systems load above 70% density.

4 Post-placement vision and continuous motion

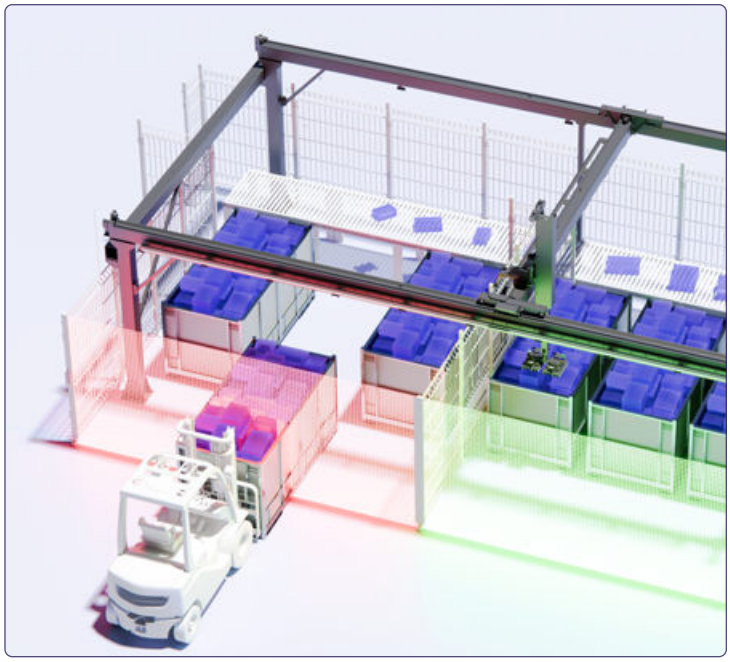




After each placement, AmbiStack images the container for quality control. Simultaneously, the gantry continues moving to singulate and grasp the next package to be stacked.

5 Load continuously with independent safety zones





Light-curtain-guarded zones let operators remove and replace full containers in one half of the machine while the gantry keeps loading in the other.







Agentic Physical AI powering high-density, real-time package stacking.

CARGO (Contact-Aware Reinforcement-learned Generalized Object-stacking) is Ambi Robotics' core reasoning model for automated item stacking. Deployed directly within AmbiStack systems, CARGO brings Sim2Real reinforcement learning out of the lab and into live production environments.

Key Capabilities

- **On-the-Fly 3D Stacking:** Plans placements in real time without requiring advance item sequencing, pre-sorting, or prior SKU knowledge.
- **Sim2Real Reinforcement Learning:** Pre-trained on over 40 million simulated stacking actions to reason over item geometry, contact physics, dynamic stability, and hardware feasibility.
- **Generalizes Across Item Types:** Instantly adapts to diverse box sizes, weights, and distributions without needing site-specific tuning or code adjustments.

Customer Impact

- **1.5-2x Throughput** over manual stacking processes.
- **Human-Level Density** achieved safely in 24/7 continuous warehouse operations.
- **Continuous System Improvement** as real-world production data flows directly back into model re-training.

Production Performance

Metric	CARGO Benchmark
Operational Container Density	>72.5% in live production (>75% in simulation)
Throughput Speed	340+ sorts per hour per robot
Baseline Improvement	Outperforms standard heuristic algorithms by 10-15% in density

Now That You Know AmbiStack Get To Know Ambi Robotics

Ambi Robotics combines hardware and software for automated sorting and stacking solutions. Powered by AmbiOS and Sim2Real AI, solutions seamlessly integrate modular components to power unique configurations. Optimize warehouse efficiency and safety in high-speed supply chain operations and start unlocking new levels of robotic dexterity.





Are you ready to handle more?

sales@ambirobotics.com →

