Robotics


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Robotics

*Pick Anything. Place Anywhere.*

# MOBILE MIXED CASE PALLETIZING WHITEPAPER

01

# Random-Sequence Mixed Case Palletizer on the Wheels

Mixed case palletizing (MCP) is an essential process for many industries such as retail, manufacturing, and logistics. It involves arranging variou products with different sizes and shapes on a pallet for storage,transportation, or distribution.

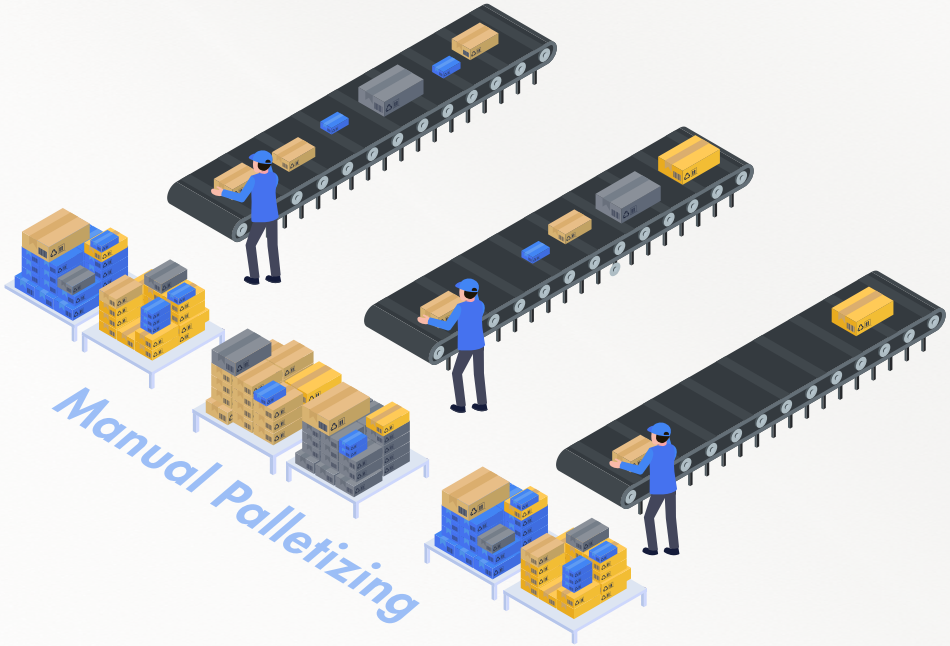
The goal is to create a stable and efficienl load that maximizes space utilization while minimizing damage to products.

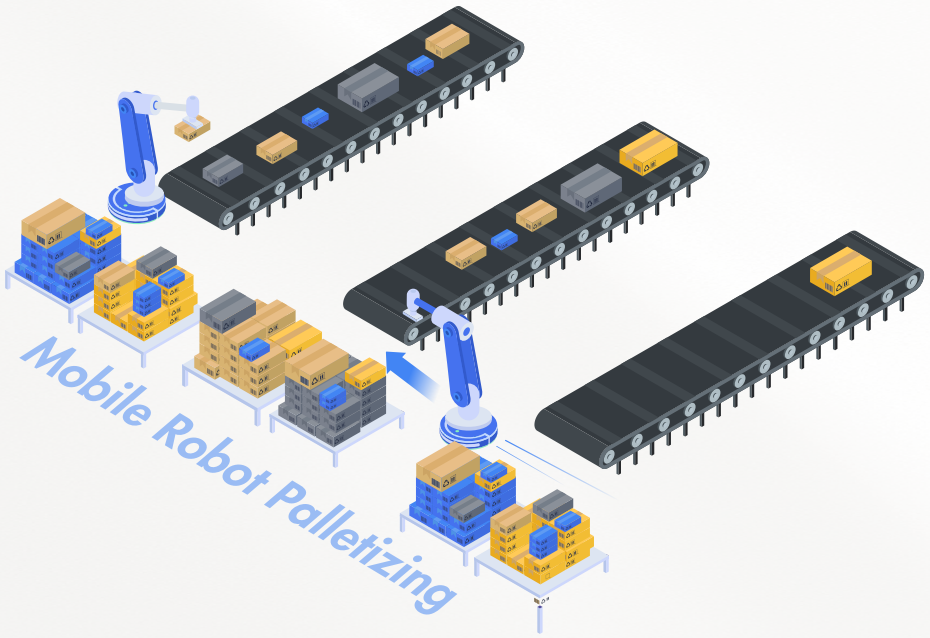
The manual method of arranging mixed case pallets is slow, inefficient, and poses significant safety risks to workers who manually lift and move heavy cases. Therefore, there is a growing need to automate MCP processes. This whitepaper introduces an innovative mobile solution for MCP.

## Our Solution: Flexible and Scalable

One of the main challenges associated with traditional controlled sequence mixed case palletizers is that they require significant investments in infrastructure, especially sequencers, which ensure items come in the correct order. Our random sequence with buffer mixed case palletizer does not require prior knowledge of the order of items and still it can produce stable and dense pallets. This makes it more flexible and cost-effective than traditional controlled sequence palletizers.

Our mobile solution addresses the challenge of high robot installation costs and variable sorter line traffic. Robots can be relocated as needed to improve flexibility, and our solution requires no additional infrastructure investment beyond the robots themselves, making it highly scalable and customizable to meet different business needs.



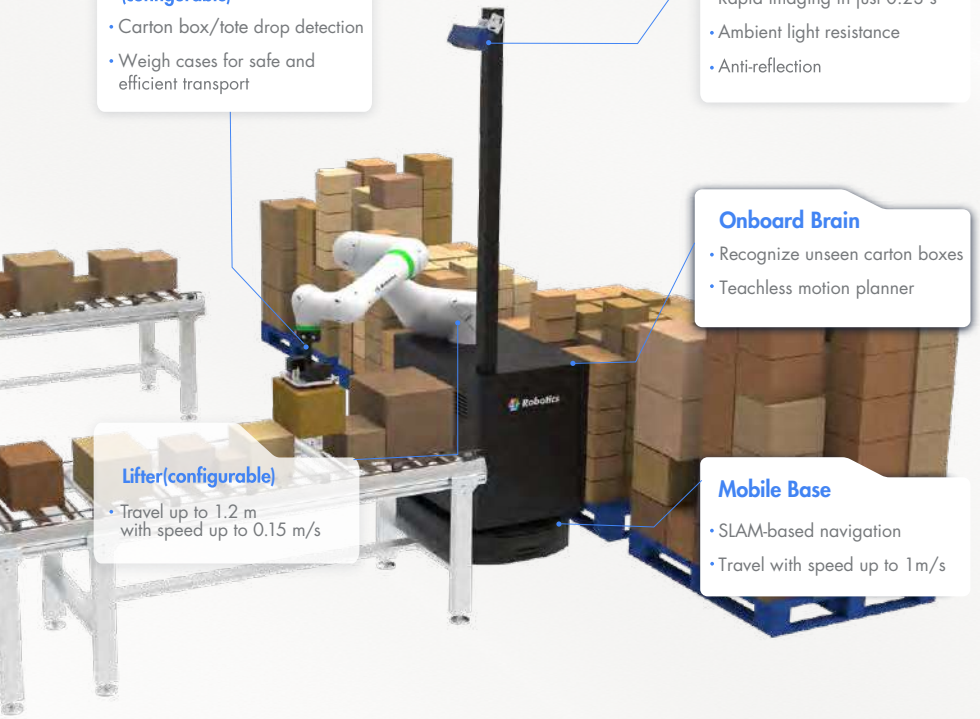
02

# System Components and Specifications

CE Certified

**Smart Gripper (configurable)**
- Carton box/tote drop detection
- Weigh cases for safe and efficient transport

**XYZ ST 3D Camera**
- Rapid imaging in just 0.23 s
- Ambient light resistance
- Anti-reflection



**Onboard Brain**
- Recognize unseen carton boxes
- Teachless motion planner

**Lifter(configurable)**
- Travel up to 1.2 m with speed up to 0.15 m/s

**Mobile Base**
- SLAM-based navigation
- Travel with speed up to 1m/s

## System Specifications

- Maximum payload: Up to 25 kg (the robot is configurable)
- Throughput: 360 cases/hr for 180° source-destination layout
- Max height of pallet: Up to 2 meters

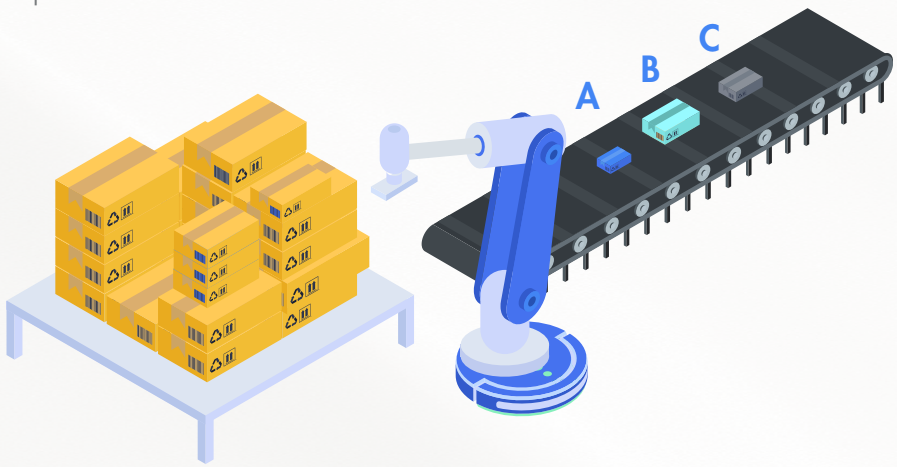
03

# No Sequencer, No Fear!

## How does random sequence with buffer MCP work?

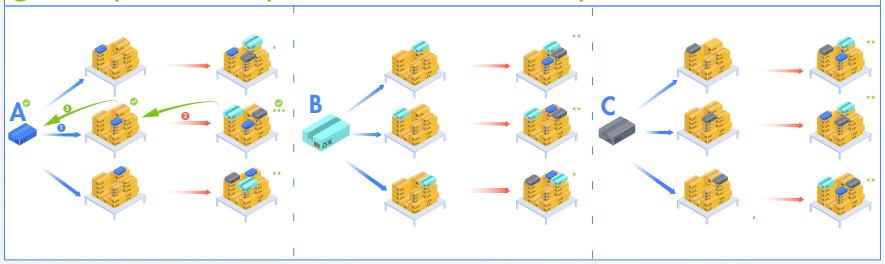
In contrast to the traditional controlled sequence MCP, the XYZ random sequence with buffer MC Psystem does not require prior knowledge of the order in which cases are received. Instead, it only requires knowledge of a few cases ahead of time, typically three buffers. The frontline of a sorter naturally creates a buffering space for this purpose.

Within the buffer, the XYZ MCP algorithm selects the optimal case and placement, ensuring a stably dense pallet both immediately and in the foreseeable future. Furthermore, if provided with complete batch or order information, our MCP algorithm can further improve case stacking by leveraging knowledge of case composition and distribution.




## How does MCP algorithm work?

1. "Try out" promising placement options
2. Rollout unplanned cases
3. Select optimal case and placement for the best forseeable pallet



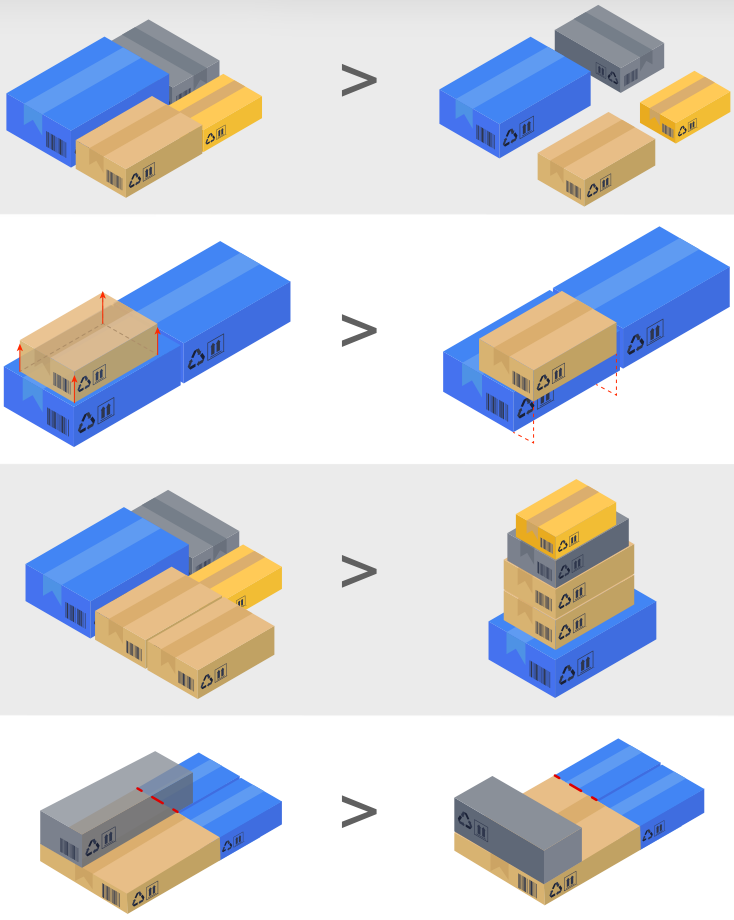
04

# No Sequencer, No Fear!

In the selection process, we consider two important metrics. The first is a local metric that measures the suitability of each placement options by evaluating a set of weighted rules or preferences. The second is a global metric that assesses overall pallet quality, taking into account stability and loading density.

Evaluating both metrics is critical to selecting the best placement options and optimizing the final pallet configuration. By considering both local and global metrics together, our algorithm aims to achieve the most optimal final outcome, balancing immediate stability needs with long-term goals.

Below are some illustrations of local placement preferences.



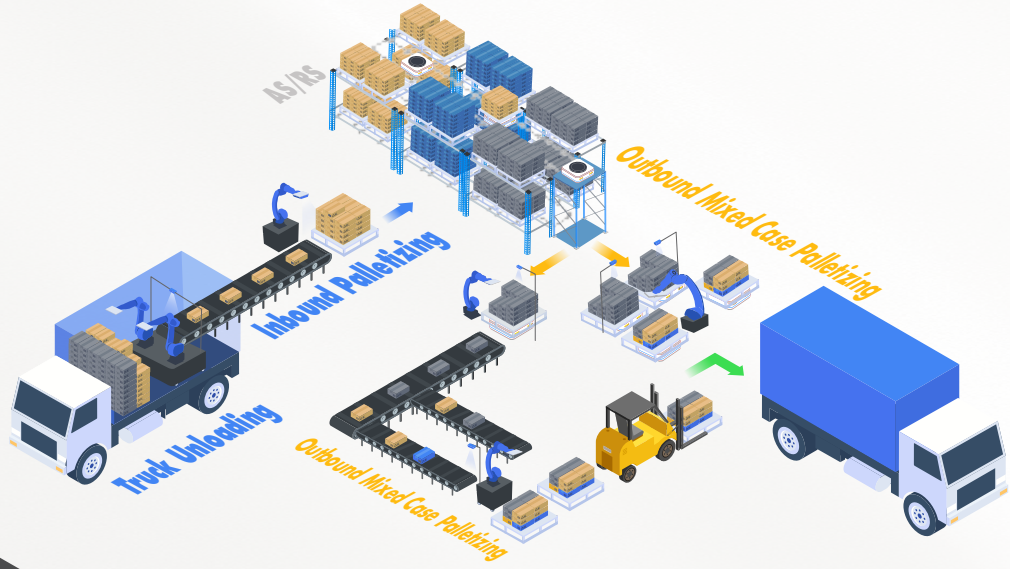
05

# Unleash Your Imagination of what can be possible

Our innovative mobile solution offers several key benefits, including reduced costs, improved safety, scalability, and flexibility. By eliminating the need for sequencers and fixed-based robots, our solution significantly lowers the overall cost of MCP. Moreover, automation reduces the risk of worker injuries associated with manual lifting and moving of heavy boxes.

In addition, our highly scalable and flexible solution enables businesses to add or remove robots as necessary to meet demand and handle diverse product mixes. Our solution is not limited to end-of-line palletizing but can also be applied to other scenarios such as truck loading and full-case picking using robots-to-goods technology.

Our Random-Sequence Mixed Case Palletizer on the Wheels technology is going to revolutionize the way your warehouse operates! We can't wait to unveil this game-changing solution that will accelerate your operations and take your warehouse to new heights of efficiency and productivity. Get ready for a whole new level of innovation and excitement in material handling!




To learn more about Random-Sequence Mixed Case Palletizer on the Wheels, please contact us at https://www.xyzrobotics.com/contact