



# NORBAC

## STORAGE & MATERIAL HANDLING SOLUTIONS

# AGENDA

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**1. WHO WE ARE**

**2. WHAT WE DO**

**3. OUR CUSTOMERS**

**4. WAREHOUSE 4.0 SOLUTIONS**

**5. WHY PARTNER WITH NORBAC**



# WHO WE ARE

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**Norbac is a minority-owned business founded in 1995 and headquartered in Austin, Texas. For 30 years, we have provided innovative, and comprehensive warehousing, material handling, and order fulfillment solutions to customers in every vertical market worldwide.**

## **Vision Statement:**

**Leading with innovative, sustainable material handling solutions, setting the standard for excellence and customer satisfaction.**

## **Mission Statement:**

**Creating shared success for clients, vendors, and employee-owners through exceptional material handling solutions driven by integrity, innovation, and collaboration.**

## **Value Proposition:**

**Norbac customizes solutions that best suit the objectives of our customers. Applying our technical knowledge and expertise we integrate the right technologies in an agnostic manner while keeping costs in check and projects on schedule.**

# WHAT WE DO

## Static Storage & Material Handling Solutions:

Norbac offers the most extensive portfolio of static storage and material handling equipment and accessories to meet the needs of customers from any industry, environment or location.





# WHAT WE DO



## **Automated Storage & Material Handling Solutions:**

Norbac is partnered with leading warehouse & material handling automation OEMs, this synergy enables us to custom-engineer and delivery holistic, turnkey solutions that empower our customers' success.

## OUR CUSTOMERS



TESLA



SPACEX



Mercedes-Benz



HONDA



JOHN DEERE

IBM

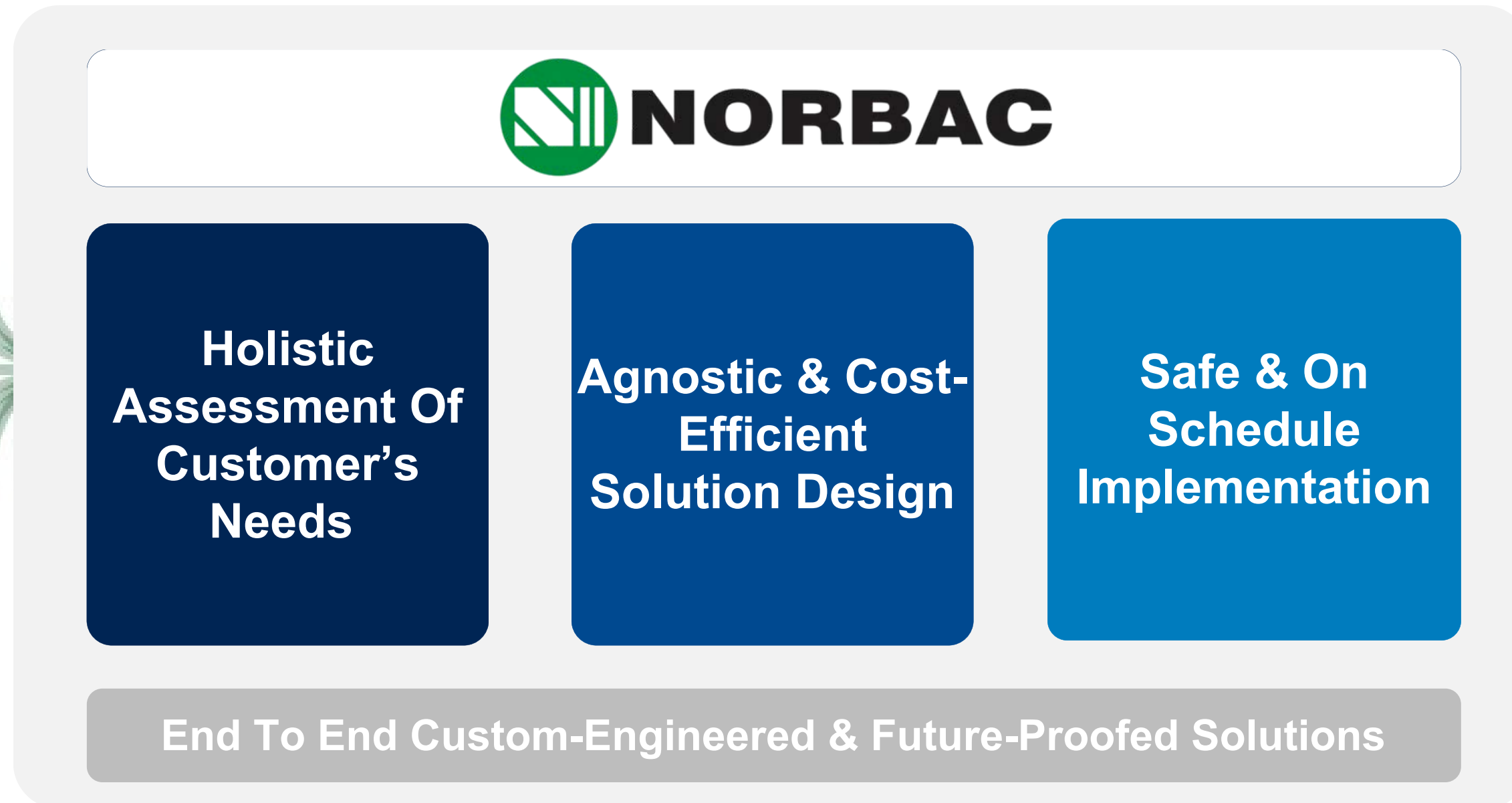


Webasto  
Feel the Drive



# WAREHOUSE 4.0 SOLUTIONS

High Density Automated Storage Systems  
Powered Conveyors & Sorters  
eCommerce/Order Fulfillment Systems  
AMRs / AGVs  
Customer's ERP  
Customer's WMS  
Customer's MRO System  
Customer's Vendor Data



Improved Overall Operational Efficiency  
Reduction of Fixed Costs  
Compliance With Safety Standards  
Leveraging Business Growth  
Meeting Customer Deadlines  
Increased Sustainability



## Improved Floor Space Utilization

- Maximized Storage Capacity
- Reduced Warehouse Footprint



## Enhanced Inventory Management

- Increased Inventory Accuracy
- Reduced Inventory Attrition
- Reduced Stockouts



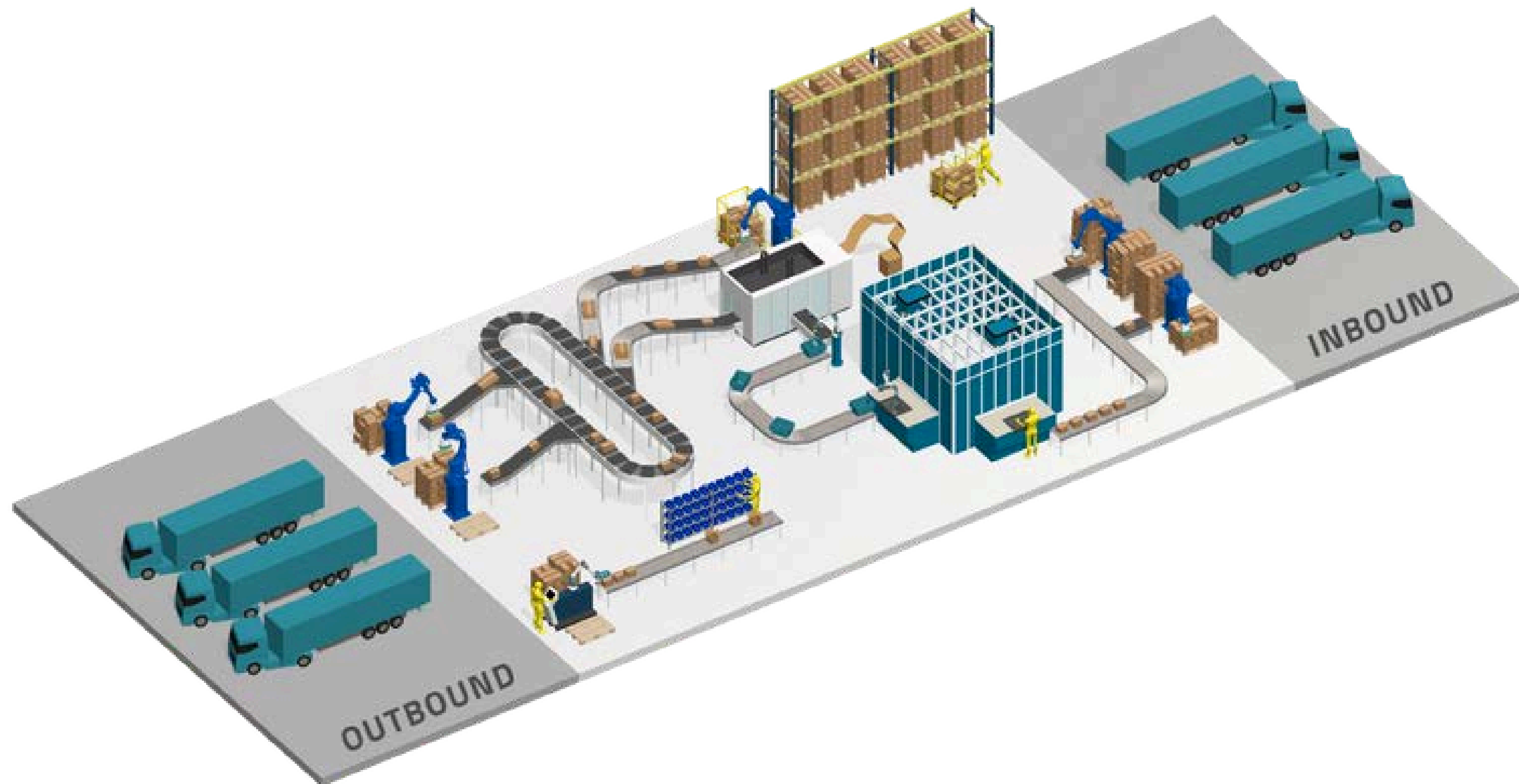
## Optimized KPIs

- Higher Number of Processed Orders
- Lower Labor Dependency
- Higher Order Accuracy



# WAREHOUSE 4.0 SOLUTIONS

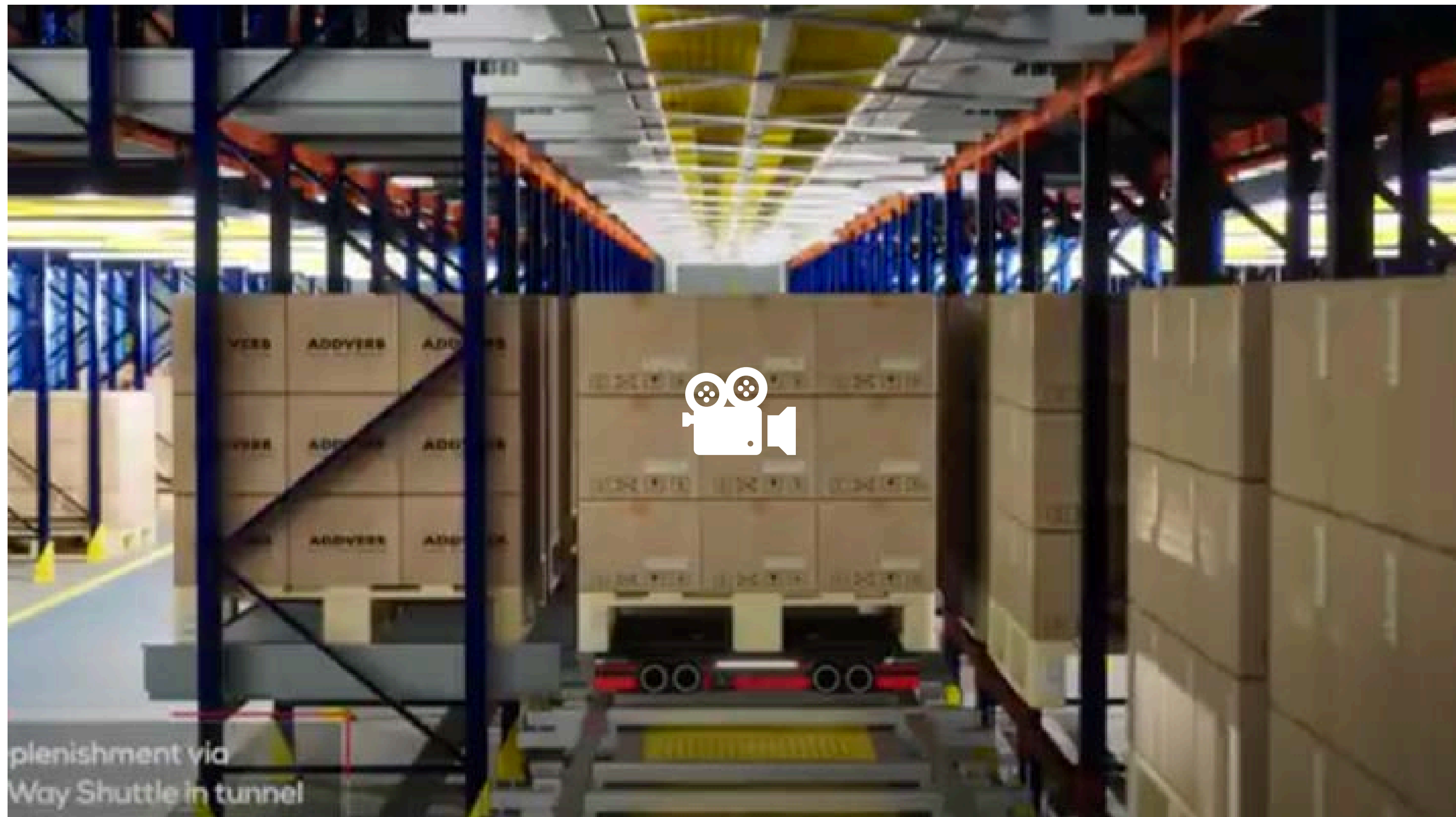
Agnostic integration of automated technologies to deliver holistic solutions





# WAREHOUSE 4.0 SOLUTIONS

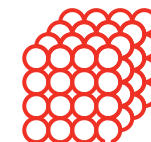
## HIGH DENSITY PALLET STORAGE & RETRIEVAL SYSTEM





# WAREHOUSE 4.0 SOLUTIONS

## HIGH DENSITY PALLET STORAGE & RETRIEVAL SYSTEM



High-Density  
Storage



Speed up to  
1.1 m/s



Energy  
Efficiency

### Advanced Battery

Equipped with replaceable Li-Ion-Phosphate battery for 8 hrs. operating time, longer lifespan and lower discharge rate

### Versatile

Can be customized for varied weights and sizes and operate between -13°F to 113°F

### Integration

Wi-Fi enabled and Seamless Integration interface with any ERP/WMS/WCS

### Cruiser 360

Pallet shuttle that enables vertical and horizontal space utilization and facilitates FIFO and LIFO operations for safe and fast load movements.

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Payload: Up to 1,500 kg / 3,307 lbs.



# WAREHOUSE 4.0 SOLUTIONS

## HIGH DENSITY / HIGH SPEED UNIT LOAD STORAGE SYSTEM

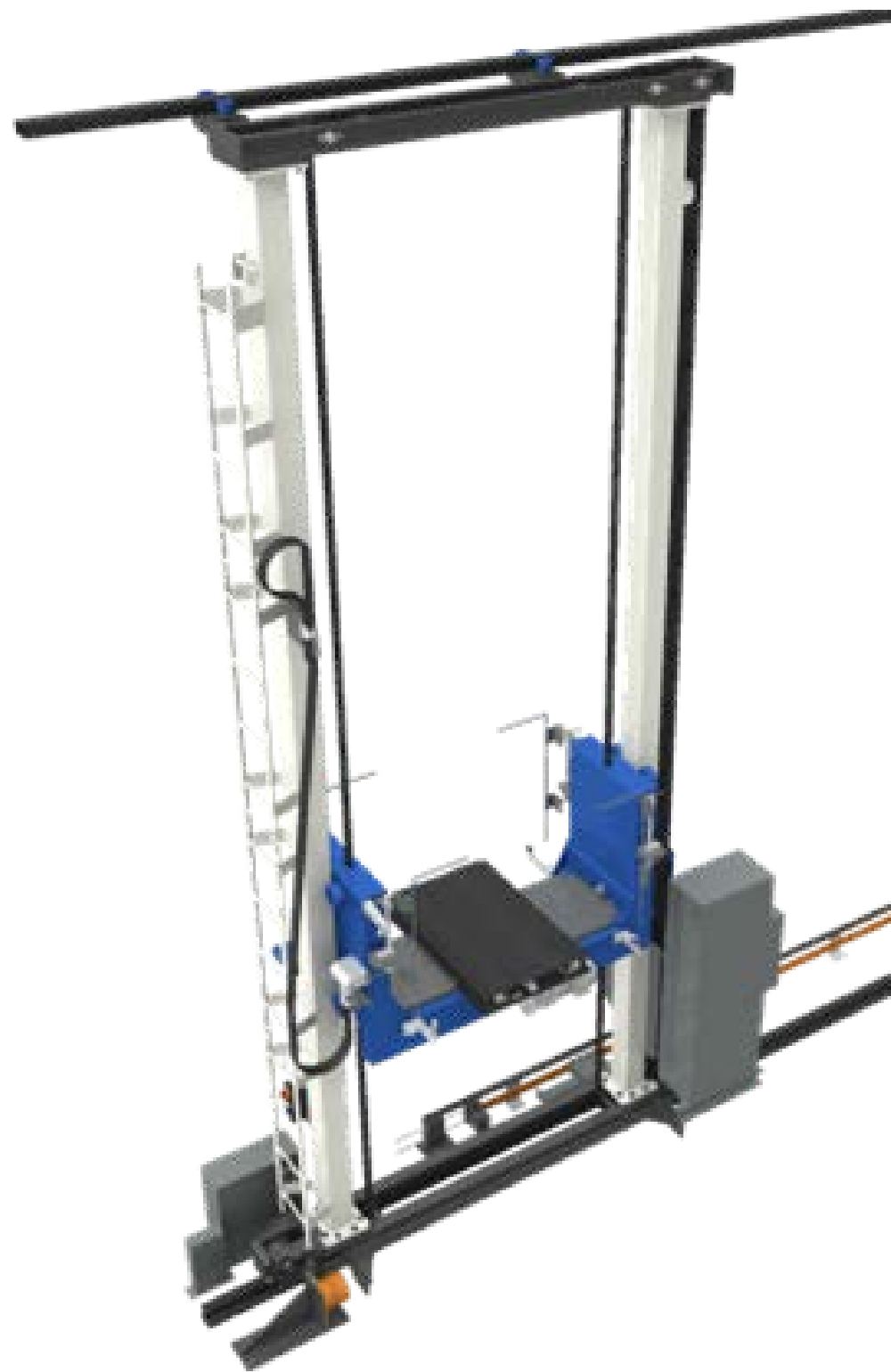






# WAREHOUSE 4.0 SOLUTIONS

## HIGH DENSITY / HIGH SPEED UNIT LOAD STORAGE SYSTEM



### Types

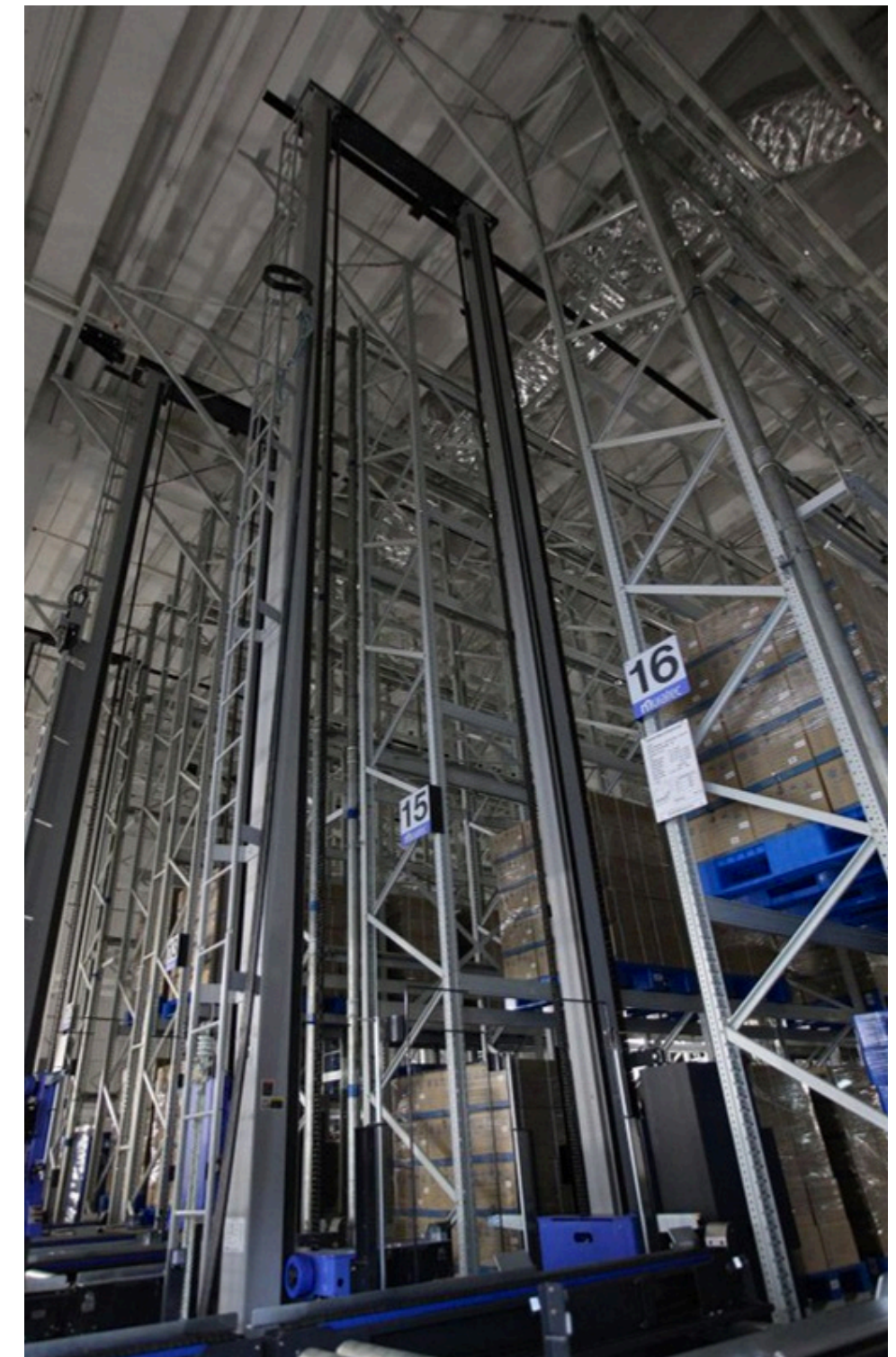
- Single & double-deep
- Multiple Carriage Configurations
- Free standing & rack supported
- -22°F to 104°F environment

### Capacity

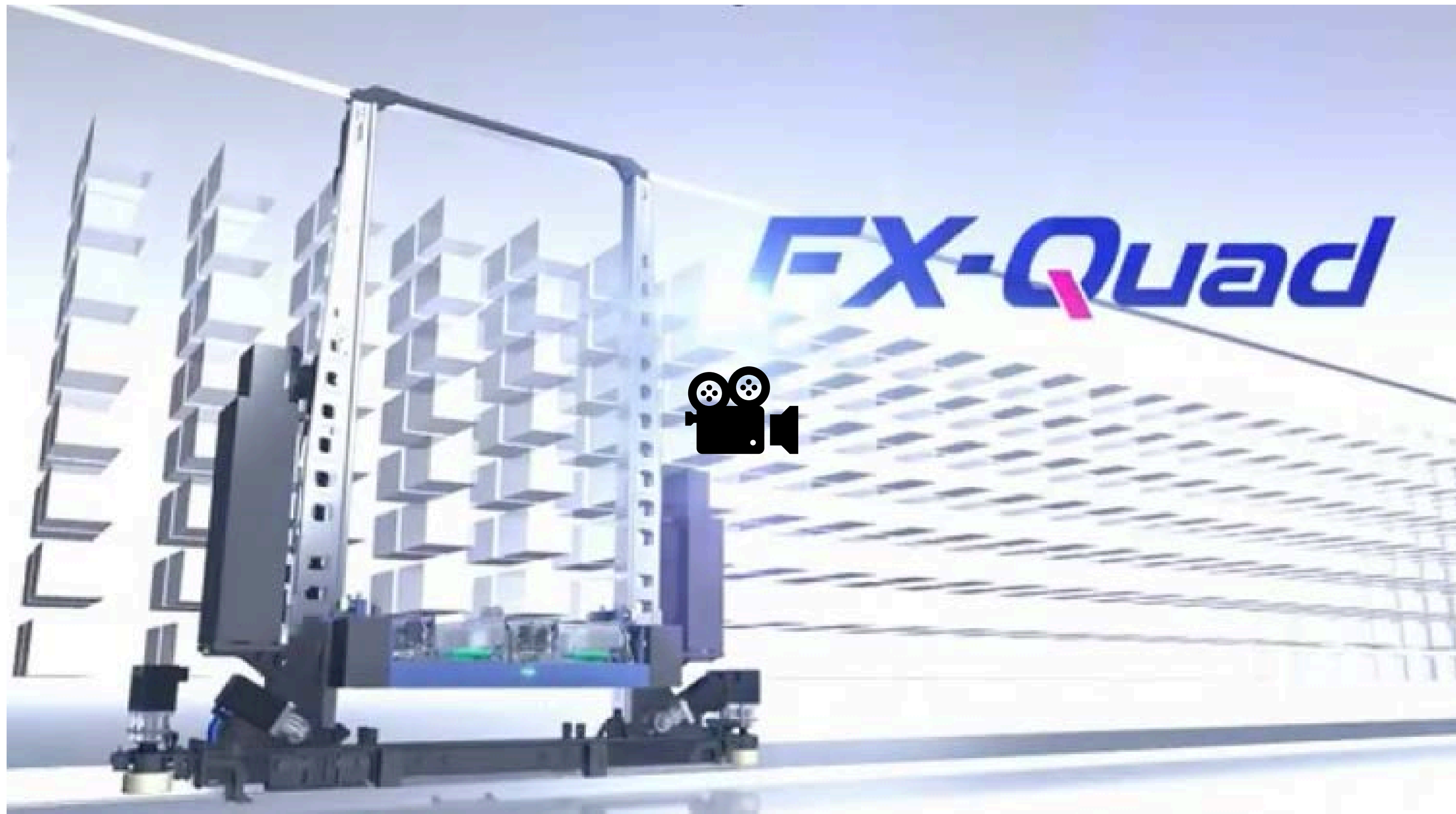
- 1,000kg to 3,300kg / 2,205 – 7,275 lbs.
- 19 ft to 131 ft+ heights
- Oversize up to 8,000kg / 17,637 lbs.

### Rates

- 40 - 70 dual cycles per hour
- Specification dependent





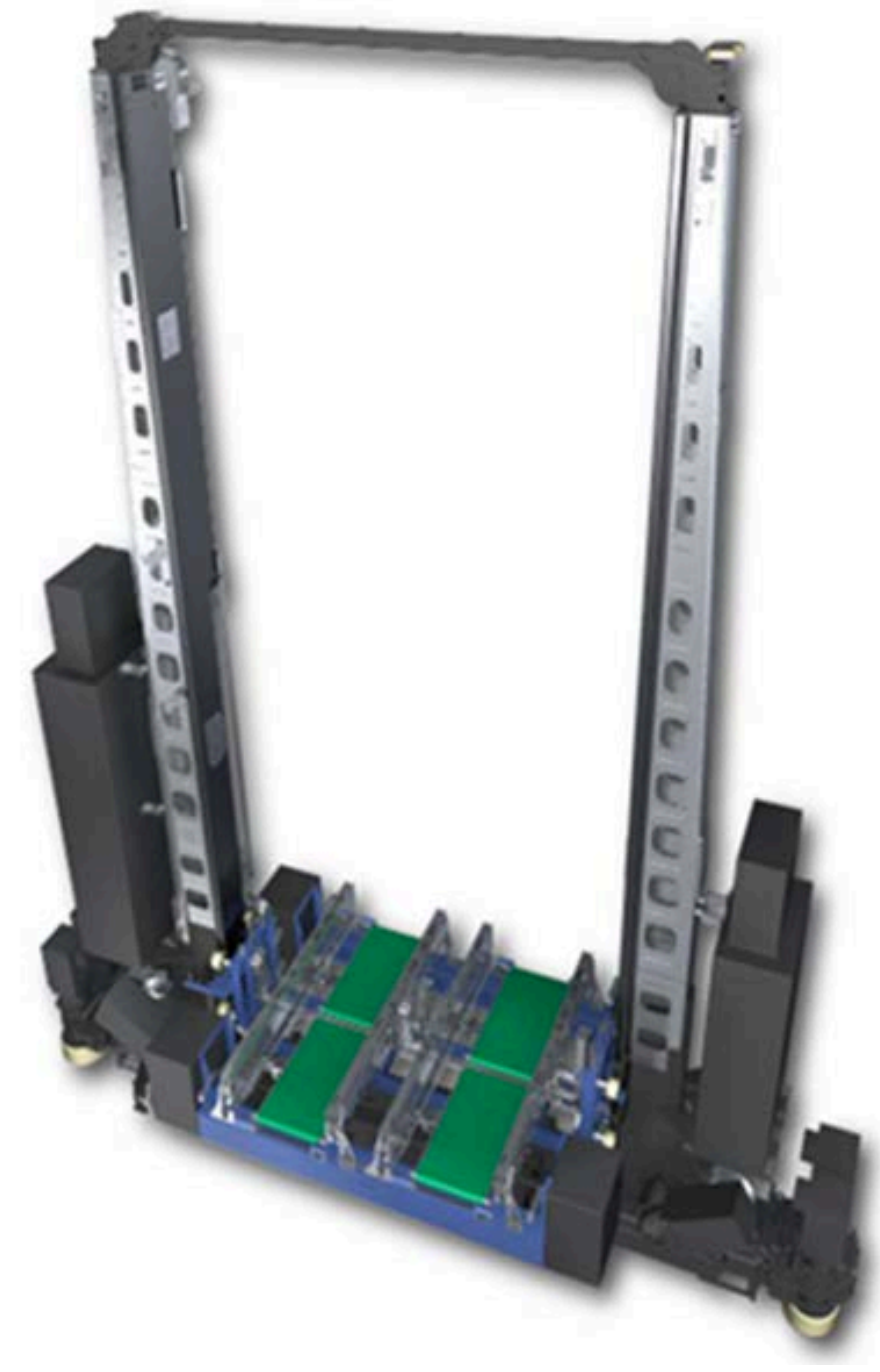






# WAREHOUSE 4.0 SOLUTIONS

## HIGH THROUGHPUT MULTI-SIZE CASE & TOTE STORAGE



### Types

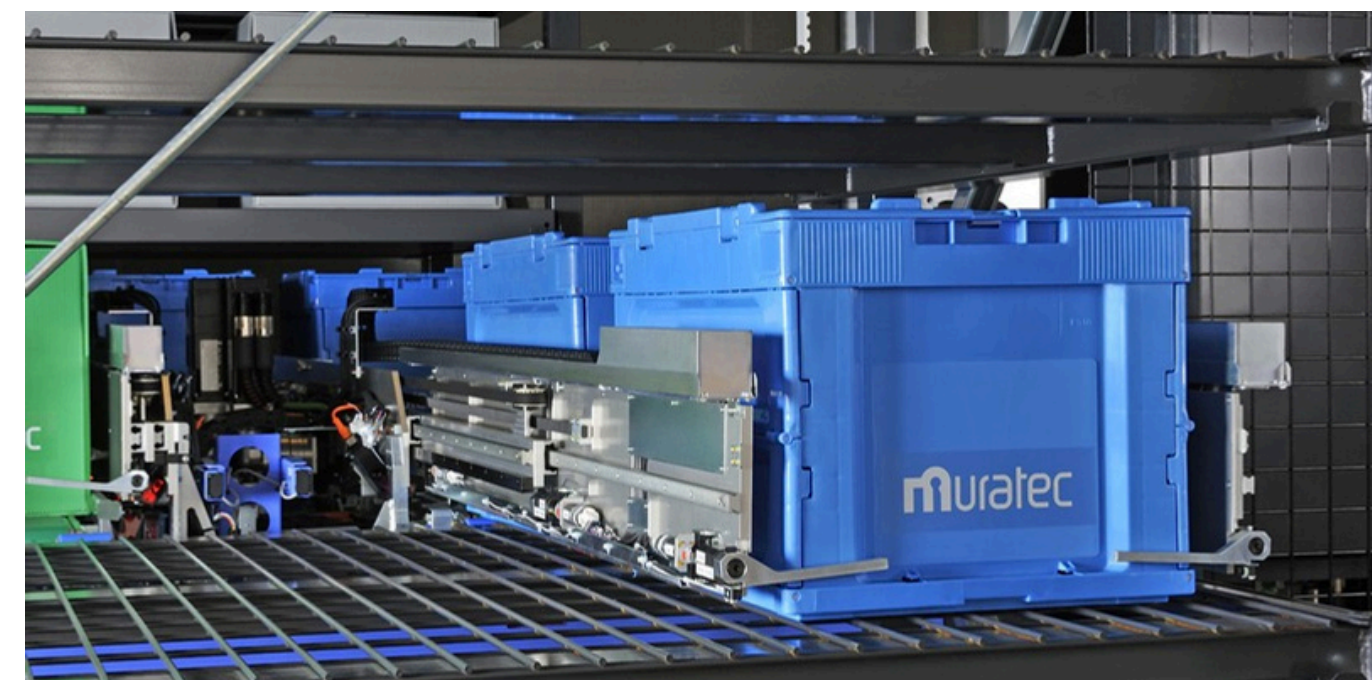
- Single & twin mast configurations
- Single & multi-shuttles
- Fixed load & free-size handling
- Free standing rack structure
- -13°F to 104°F environment
- Configurations from 19 ft. to 59 ft.

### Capacity

- Standard totes, cases, boxes
- Standard up to 220 lbs. (100kg) load weight

### Rates

- 70 - 250 dual cycles per hour
- Specification dependent





# WAREHOUSE 4.0 SOLUTIONS

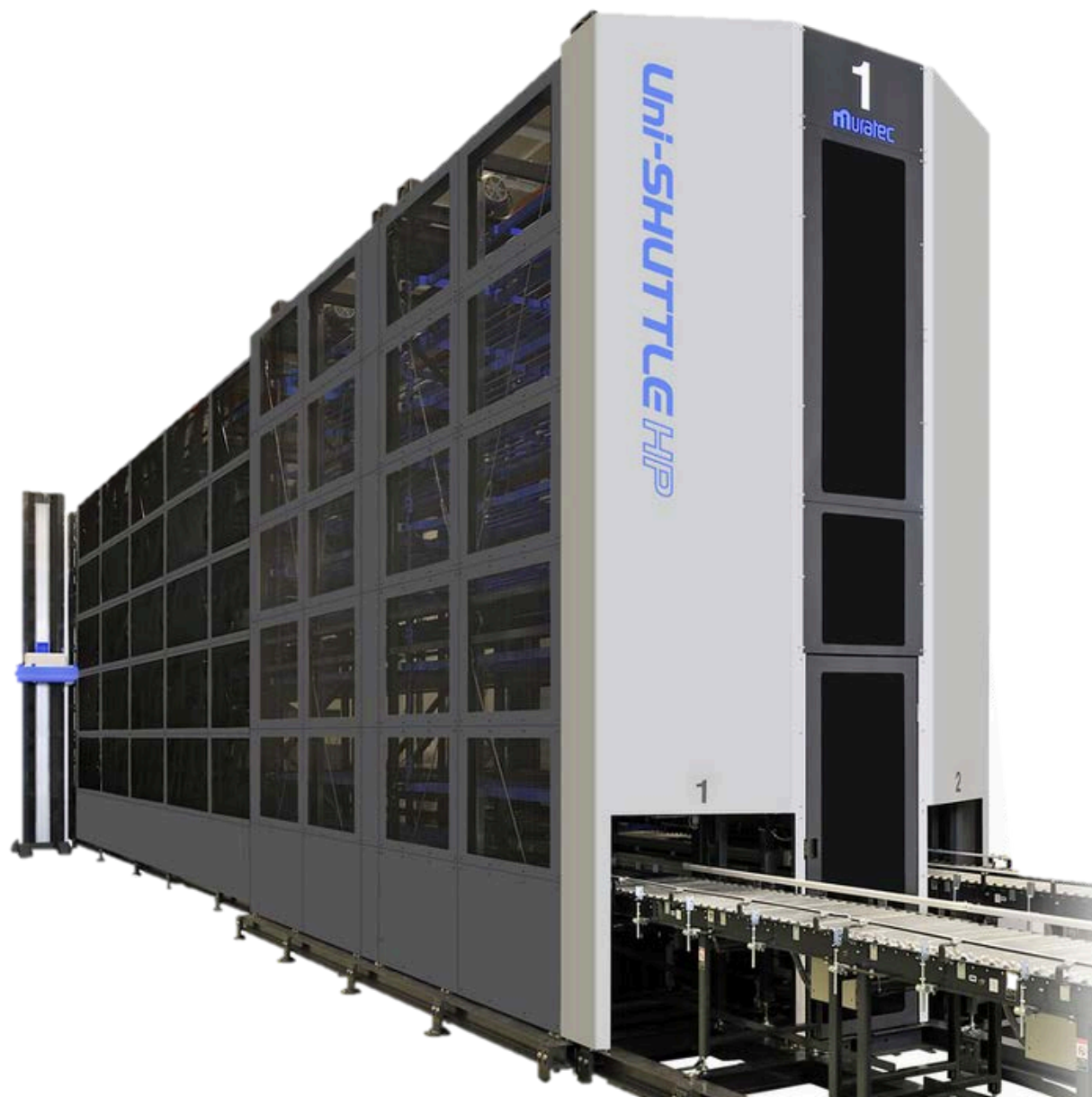
## HIGH SPEED MULTI-SIZE CASE & TOTE SEQUENCING - SORTING





# WAREHOUSE 4.0 SOLUTIONS

## HIGH SPEED MULTI-SIZE CASE & TOTE SEQUENCING - SORTING



- High speed sequencing and sorting shuttles
- Vertical lift modules
- Shuttle travel Speed up to 1,312 ft/min
- Shuttle lift speed up to 393 ft/min
- Single, double and triple deep racking.
- Max load capacity 77 lbs.
- Height between 7 ft and 30 ft
- Single or twin lifters
- 32°F to 104°F environment
- Up to 3,000 combined loads/hr.



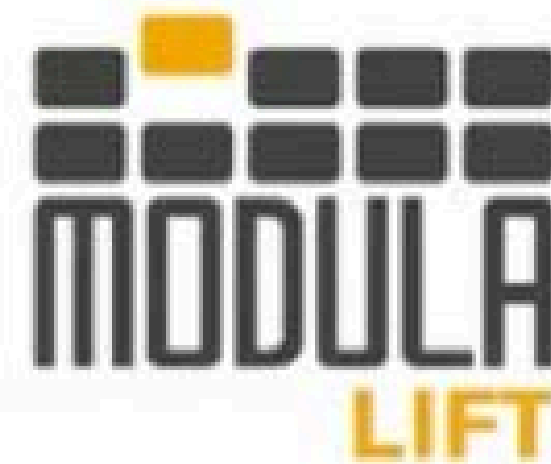
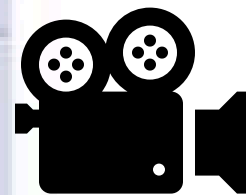


# WAREHOUSE 4.0 SOLUTIONS

## BROKEN CASE / SMALL PARTS STORAGE & RETRIEVAL



TAKE YOUR MATERIAL HANDLING  
TO THE NEXT LEVEL



# WAREHOUSE 4.0 SOLUTIONS

## BROKEN CASE / SMALL PARTS STORAGE & RETRIEVAL



### IMPROVES EFFICIENCY

Fulfill orders efficiently without picking errors



### MANAGES INVENTORY

Monitor stock levels and inventory transactions with just one click



### RECOVERS SPACE

Saves up to 90% of valuable floor space compared to traditional storage methods



### SAVES TIME

Retrieve the parts and products you need instantly



### INCREASES SECURITY

Enclosed storage that keeps your spare parts secure



### REDUCES RISKS

No more climbing stairs or mezzanines to retrieve your goods



Think it's a big investment?

**100% ROI**  
12-18 months on average

# WAREHOUSE 4.0 SOLUTIONS

## FULLY AUTOMATED ACCUMULATION CONVEYING



# WAREHOUSE 4.0 SOLUTIONS

## FULLY AUTOMATED ACCUMULATION CONVEYING

### END DRIVE



- 12' bed – factory assembled
- Full skew bed available
- Pneumatic tensioner with maintenance monitoring
- Controller power supply included

### INTERMEDIATE



- 3', 6', 9', or 12' beds
- Rollers and modules factory installed
- Touch up skew compatible

### END IDLER



- 12' bed – factory assembled
- Pneumatic brake option
- End pulley tracking features
- Dual 24V & 120V interface module ships standard

### BENEFITS

- Handles totes, cartons, parcels and more
- 3' zones maximize accumulation density
- Universal Photo eye, same as used with Series 1500 MDR
- Pneumatically controlled zone brakes available
- Modular design, factory readied quick connect installation
- Release efficiency up to:
  - 50% Singulation, 75% Auto-Slug, 95% Slug Release
- Across-The-Line Start, Soft Start, or VFD compatible
- Easy installation & maintenance

### FEATURES

- Belt Pull: 500 lbs.
- Speeds: Up to 300 FPM\*
- BFs: 15", 21", 27", 33" & 36"
- Intermediates: 3', 6', 9', or 12'
- Zone Length: 3'
- Horsepower: Up to 5 HP
- Operating Temp: 32° to 104°F
- Bottom Guard/Dust cover compatible

\* Typical accumulation is 180 FPM or less





# WAREHOUSE 4.0 SOLUTIONS

## HIGH SPEED LINEAR SORTATION





# WAREHOUSE 4.0 SOLUTIONS

## HIGH SPEED LINEAR SORTATION

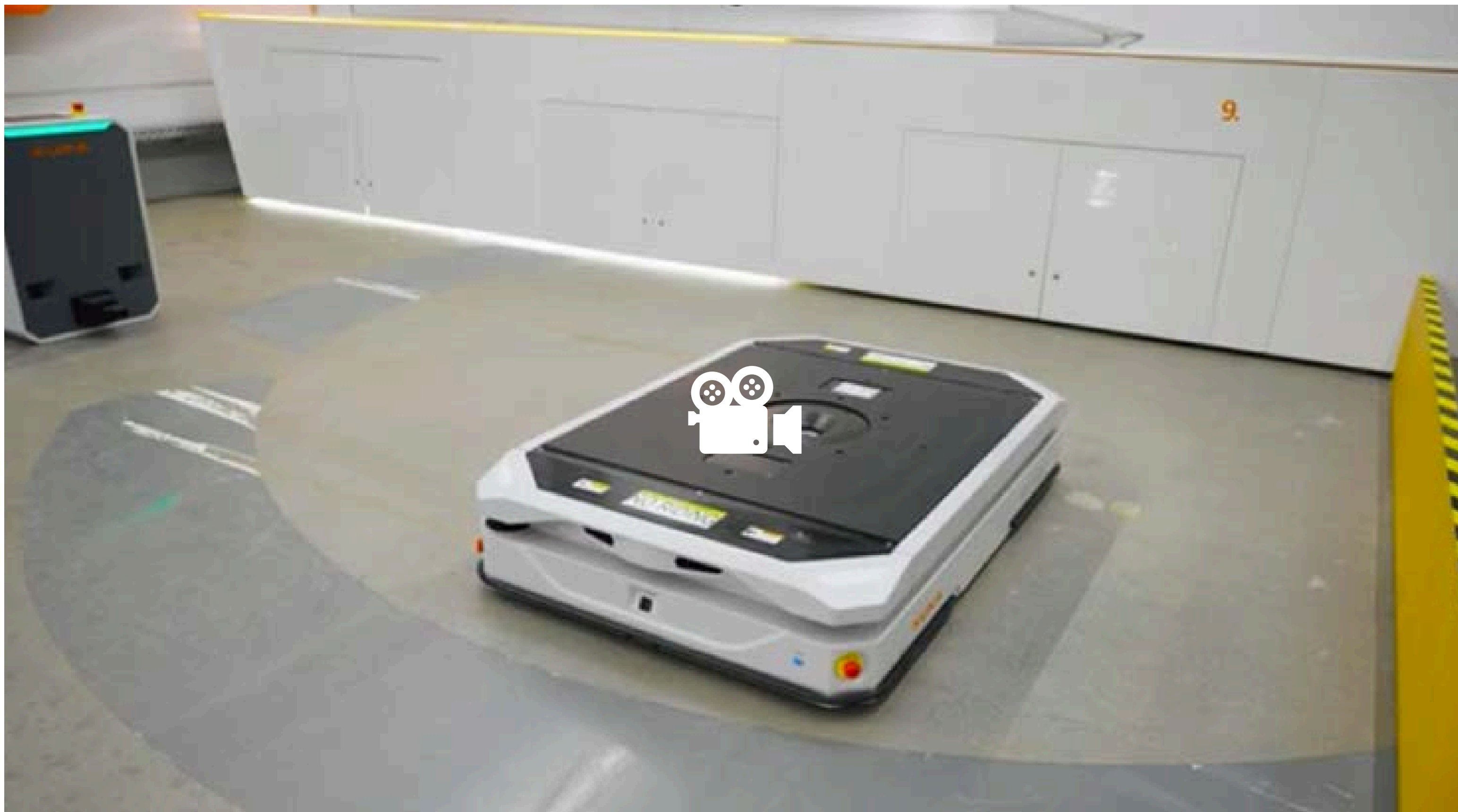
Rates 300 CPM  
Speeds 700 FPM  
Divert Angles 20°, 30°  
MTBH Cartons, Totes, Polybags, Jiffy Mailers  
Min. Product (LxWxH) 6" x 2" x 0.2"  
Max. Product (LxWxH) 78" x 34" x After sort Dependent  
Min Weight 0.4 lbs.  
Max Weight 100 lbs. / ft  
Sided Single / Dual  
Switch Type Electric  
Switch Location Moveable Infinite Adjustability  
Min Divert Centers 4'  
Shoe Pitch 5"  
Slat Gap Closed Deck  
Effective Widths 27", 36"  
Top of Sorter Elevation 32"  
Divert Control 24v Non-Proprietary Control Module  
Chain Oiling Yes  
Max Length 750'  
Temperature 20° - 120°F  
Noise Levels <77dB @600fpm





# WAREHOUSE 4.0 SOLUTIONS

## FULLY AUTONOMOUS MATERIAL HANDLING SOLUTIONS



# WAREHOUSE 4.0 SOLUTIONS

## FULLY AUTONOMOUS MATERIAL HANDLING SOLUTIONS



**600kg**

**KMP 600P**

*Differential drive*

**[+] 3D Camera Detection**

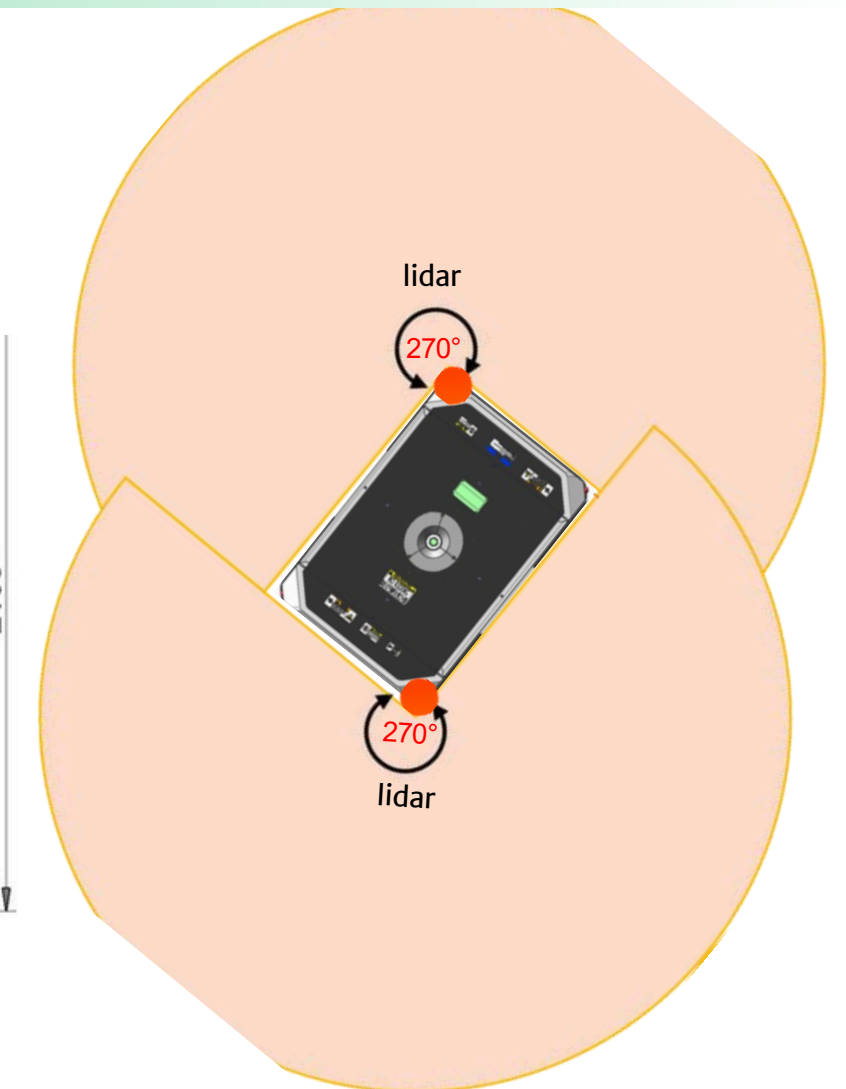
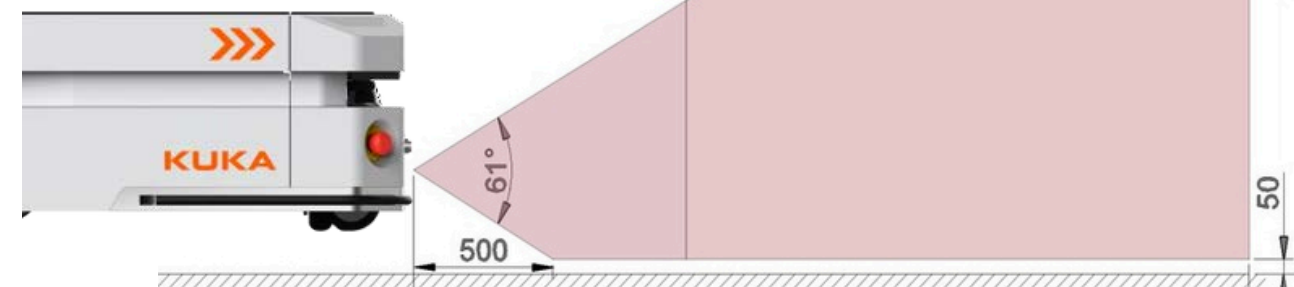
- Detects objects from 50mm to 2000mm
- Detects object size from 80x80x80mm
- 3D Cameras on Front and Rear.



**1500kg**

**KMP 1500P**

*Differential drive*



**3000kg**

**KMP 3000P**

*Omni-Directional*

**[+] Safety Bumper**

- Physical E-stop safety bumper
- Coverage on all sides



**[+] Safety Lidar Detection**

- 360-degree safety field
- Multiple scan fields(Speed defined)
- 3000mm scan radius

**[+] E-stop Circuit**

- Located on all 4 corners
- Physical E-stop circuit

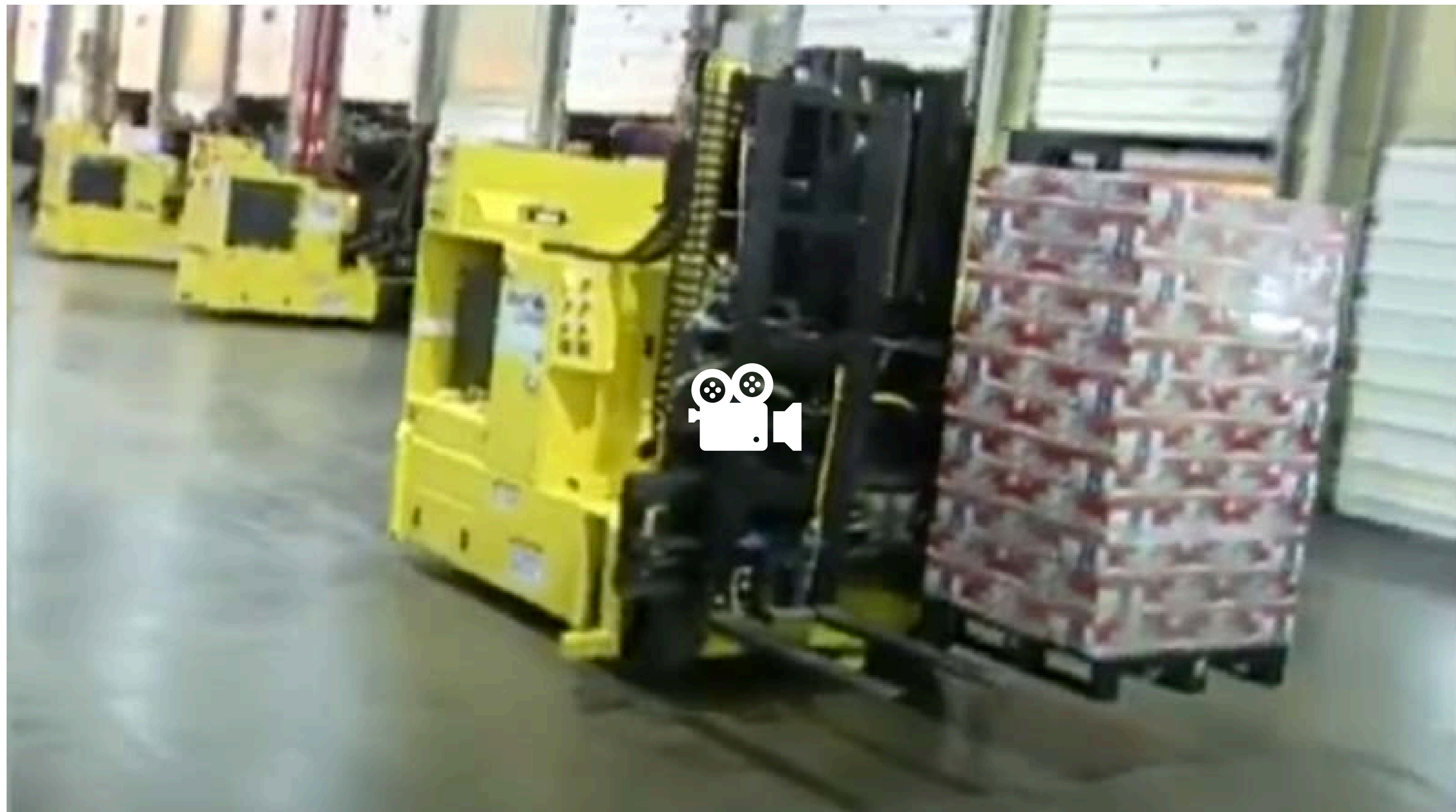






# WAREHOUSE 4.0 SOLUTIONS

CUSTOM-BUILT AUTONOMOUS GUIDED VEHICLES (AGVs)





## CUSTOM-BUILT AUTONOMOUS GUIDED VEHICLES (AGVs)



### M100-ST – Tunnel/Tugger

#### 885 kg Max Towing Capacity

Weight / with batteries: 122 kg / 147 kg  
 Dimensions: W: 511 mm L: 991 mm H: 292 mm  
 Traction Power: 18 kg constant, 36+ kg starting  
 Safety – Front/rear: CE/UKCA rated safety bumper  
 Speed – Laser Bumper: 4.6 to 48.8 MPM - 6 speeds, 0.3 MPM increments  
 Maximum 9.1 MPM (if equipped)

Rated Trailer: 885 kg @ 30.5 MPM  
 476 kg @ 48.8 MPM  
 With 2% friction factor trailer wheels  
 Capacity reduced by 10% when reversing  
 1% Incline/Decline 499 kg @ 30.5 MPM

Battery : AGM/TPPL 45AH 24VDC battery pack  
 Automatic Charge 48-amp charge rate (if equipped)  
 Manual Charge Up to 25-amp charge rate, via manual plug



### M300-CF – Counterbalance Fork

#### 635 kg at 508 mm l.c.

#### 558 kg at 610 mm l.c.

Weight / with batteries: 1173 kg  
 Dimensions: W: 1041 mm L: 2819 mm H: 2134 mm  
 Maximum Load: 635 kg at 508 mm load center / 558 kg at 610 mm load center  
 Lift Range: Floor to 1219 mm  
 Safety: Front/Rear Laser Bumper CE/UKCA rated safety bumper (16 Pattern)  
 Speed: 4.6 to 73.2 MPM, (48.8 MPM with laser guidance)  
 6 speeds, 0.3 MPM increments

Battery Options: AGM 210 AH 24 VDC Battery Pack  
 AGM/TPPL 204 AH 24 VDC Battery Pack  
 Lithium 180AH 24VDC battery Pack

Automatic Charge: 80-amp charge rate  
 Fast Automatic Charge: 140-amp charge rate  
 Manual Charge: Up to 25-amp charge rate



### M300-SC – Single Conveyor

#### 1,451 kg Capacity

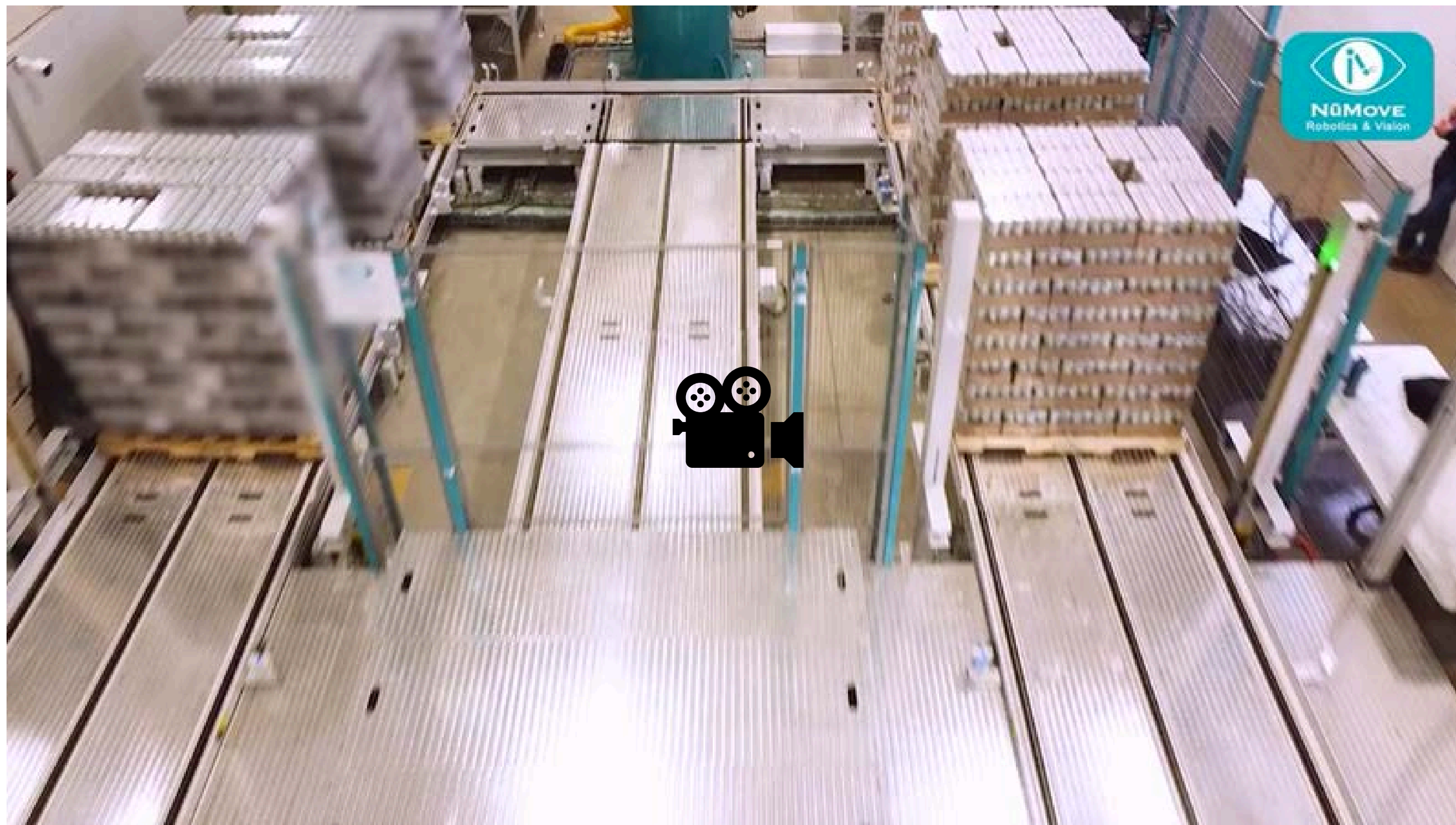
Weight / with batteries 1070 kg / 1179 kg  
 Dimensions: W: 1448 mm L: 2311 mm H: 1295 mm  
 Maximum Load: 1451 kg Minimum 1016 mm x 1016 mm distributed load  
 Maximum Pallet: 1200 mm x 1200 mm  
 Roller Conveyor: 64 mm dia., 11 GA wall 83 mm on center  
 Effective Widths: 1041/1092/1168/1245 mm- width of pallet in direction of transfer  
 Top of Roll: 457 mm to 813 mm in 25.4 mm increments  
 Transfer Speed: 13.7 to 3.1 MPM, soft start  
 Load Sensing: Yes, using cross conveyor optic  
 Transfer: Left and Right side  
 Transfer: Interface Optical with emitter and receiver pair on each side  
 Safety – Front: CE/UKCA rated safety bumper  
 Speed – Laser Bumper: 4.6 to 73.2 MPM, (73.2 MPM with laser guidance)  
 6 speeds, 0.3 MPM increments

Battery Options: AGM 210 AH 24VDC battery pack  
 AGM/TPPL 204 AH 24VDC battery pack Lithium 180AH 24VDC battery pack  
 Automatic Charge: 80-amp charge rate (if equipped)  
 Fast Automatic Charge: 140-amp charge rate (if equipped)  
 Manual Charge: Up to 25-amp charge rate



# WAREHOUSE 4.0 SOLUTIONS

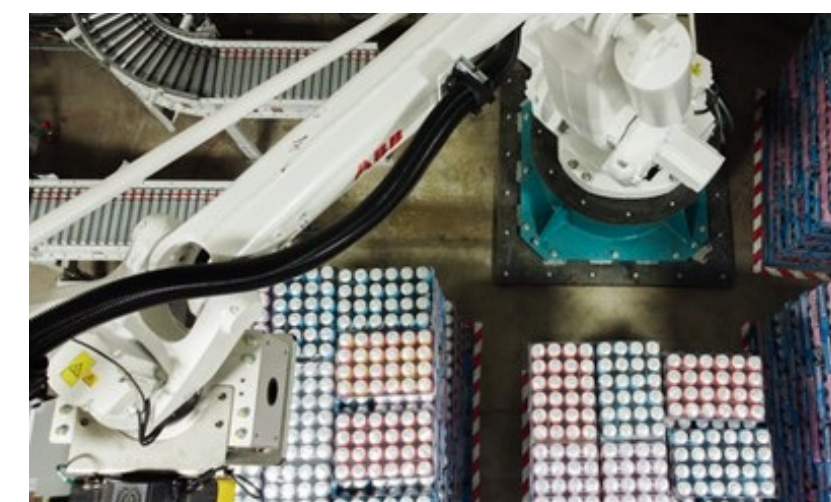
## ROBOTIC DEPALLETIZING SYSTEM



**Layer Depalletizing**



**Row Depalletizing**



**Assorted SKU Depalletizing**





# WAREHOUSE 4.0 SOLUTIONS

## ROBOTIC PALLETIZING SYSTEM



Layer Palletizing



Row Palletizing



Assorted SKU Palletizing



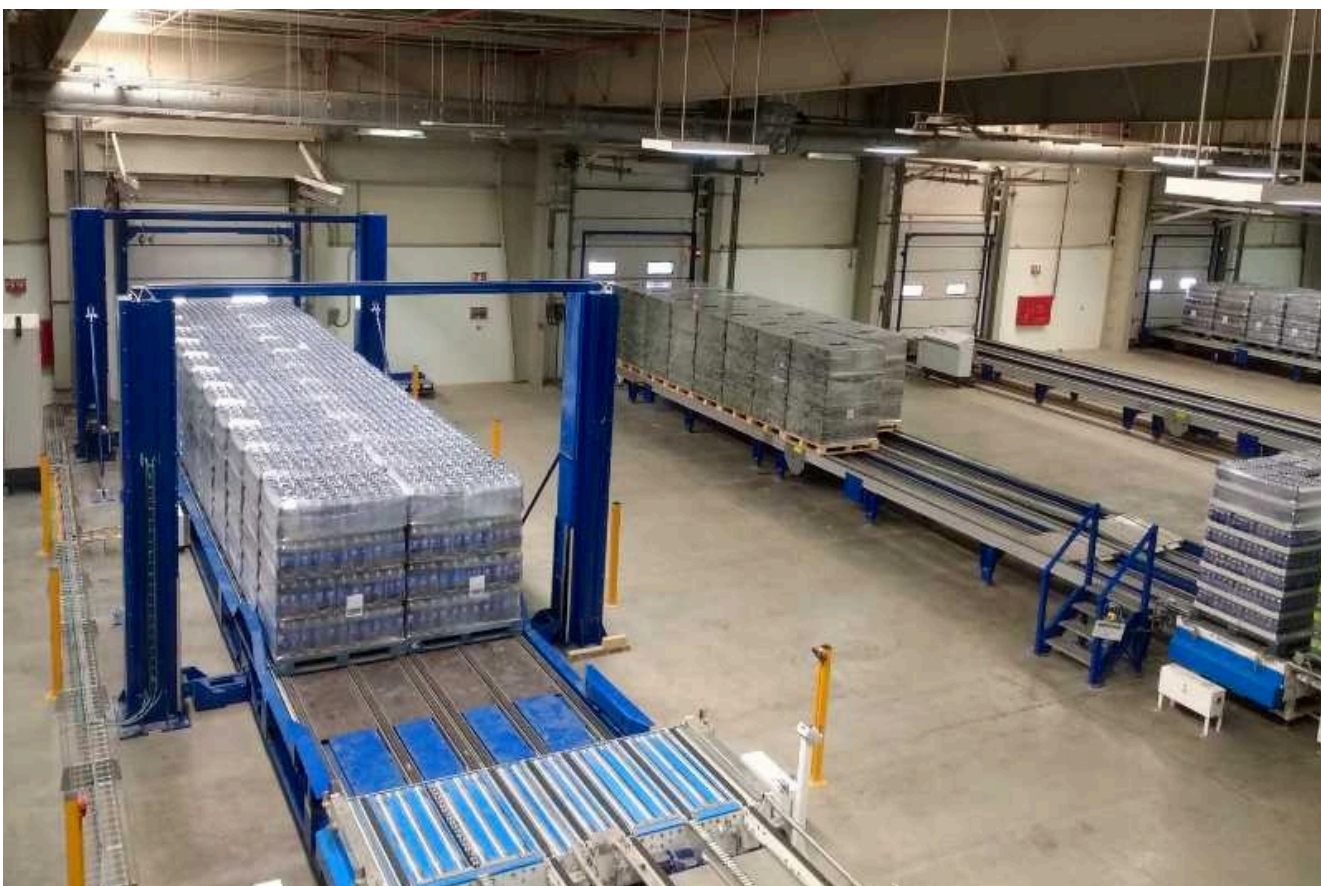
# WAREHOUSE 4.0 SOLUTIONS

## AUTOMATIC TRAILER PALLET LOADING



# WAREHOUSE 4.0 SOLUTIONS

## AUTOMATIC TRAILER PALLET LOADING



The Skateloader has been developed and engineered for the automated loading of non-modified trailers. This means that no trailer modifications are required making the Skateloader the ultimate solution for one-shot loading of standard pallets for outbound transport. The loading process takes approximately 6-8 minutes (depending on the required height adjustment and alignment).

### Advantages of the Skateloader system:

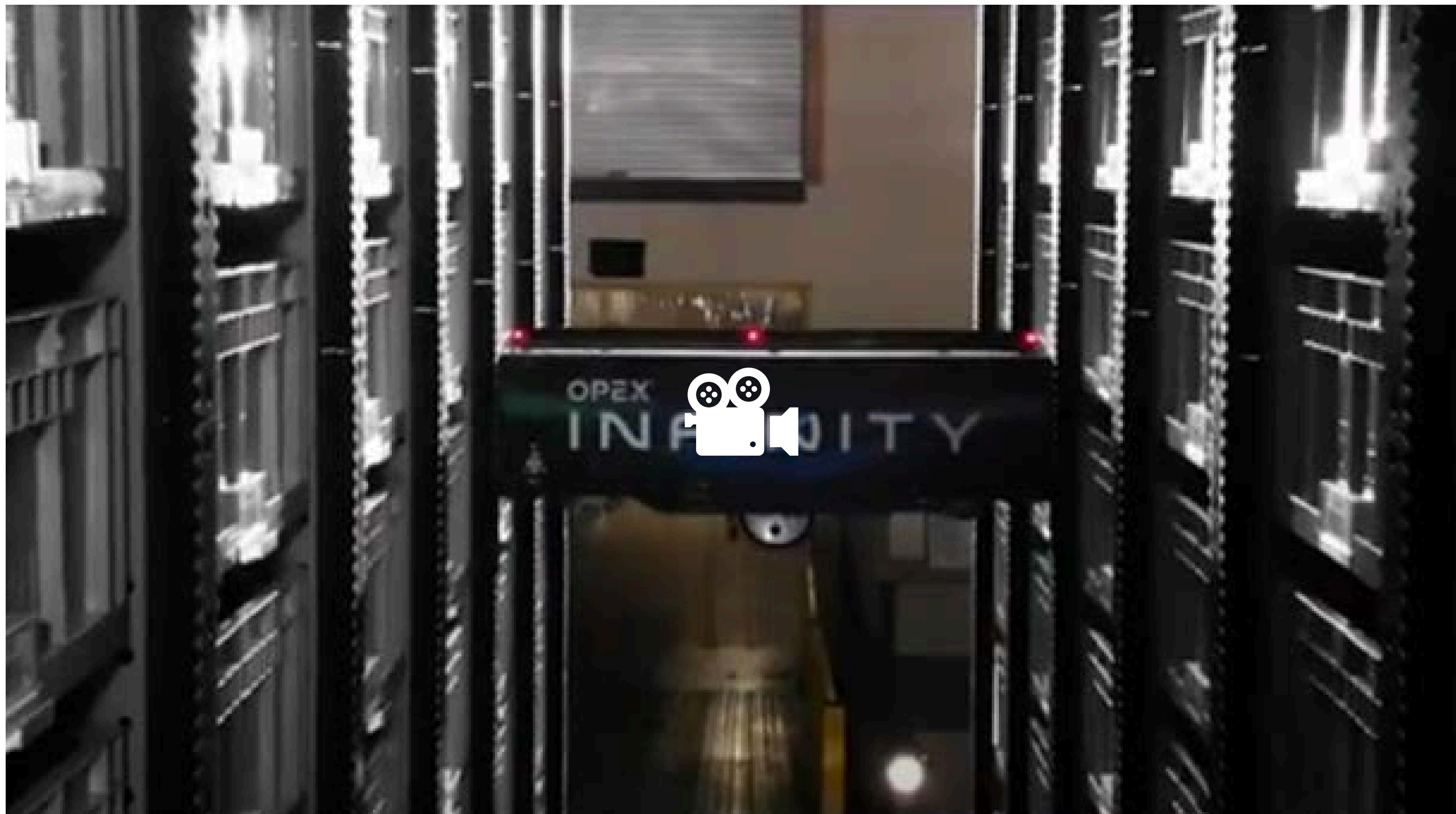
- 400% efficiency increase compared to traditional forklift truck loading
- Automated loading of regular, non-modified trailers or containers; no alterations required
- Short loading cycle (< 8 min.)
- Shorter truck time at the dock
- Improve employee working conditions
- Protect the integrity of your products





# WAREHOUSE 4.0 SOLUTIONS

HIGH SKU VOLUME / MID-THROUGHPUT STORAGE & RETRIVAL







# WAREHOUSE 4.0 SOLUTIONS

## HIGH SKU VOLUME / MID-THROUGHPUT STORAGE & RETRIVAL

### // SIMPLICITY

- Limited moving parts on the Infinity iBOT mean less mechanical breakdown
- Operators can be up and running in minutes
- Ergonomic, self-tilting bot at presentation station creates ease of use for operator

### // EFFICIENCY

- Single bot can access the entire array of storage, as well as each presentation station
- Fewer operators are required for operation since two Infinity iBOTs can shuttle simultaneously rather than having separate aisles

### // PRODUCTIVITY

- High storage density with 3 tote deep storage design
- Configurable tote height from 8", 10", 12" and 14" height
- Up to 325 tote deliveries per hour per workstation







# WAREHOUSE 4.0 SOLUTIONS

## MID SKU VOLUME / HIGH THROUGHPUT STORAGE & RETRIVAL



### //SCALABLE

- System is scalable and customizable
- As volume grows, more iBOTs can be added to increase throughput

### //EFFICIENCY

- iBOTs are not required to leave the system to dock and charge, they continually recharge as they travel through the system
- Traffic control software to monitor the position of all iBOTs to ensure full resource optimization and operational efficiency

### //PRODUCTIVITY

- Up to 450 tote deliveries per hour per workstation
- Can hold up to 12,228 totes securely storing thousands of items
- Perfect Pick: 15,019 ft<sup>3</sup> (425.29 m<sup>3</sup>) of storage within 1,968 ft<sup>2</sup> (182.83 m<sup>2</sup>) of space
- Perfect Pick HD: 30,038 ft<sup>3</sup> (850.58 m<sup>3</sup>) storage 2,869 ft<sup>2</sup> (266.54 m<sup>2</sup>)



**ROBOTIC  
SORTER**





# WAREHOUSE 4.0 SOLUTIONS

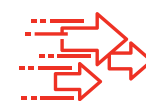
## HIGH ORDER VOLUME ROBOTIC SORTING FOR E-COMMERCE



### Zippy

Our ultra-fast robotic sorter, that performs SKU-wise intelligent sortation through grid-based ground markers.

Payload: 6, 10, 30, 40 kg



Speed up to  
2m/s



Obstacle  
Detection &  
Avoidance



Run-Time up to  
4 hours

### Scalable

Can be scaled on one platform from 50 to 1000 with easy addition and removal of Zippy robots

### High Throughput

Performs up to 30,000 sorts/hour with 100% positional accuracy

### Safety

Proprietary safety control board enables critical hardware monitoring, wireless emergency stop, and Plc level safety

# WAREHOUSE 4.0 SOLUTIONS

## BARCODE/DATA & CUBIC SCANNING SYSTEMS

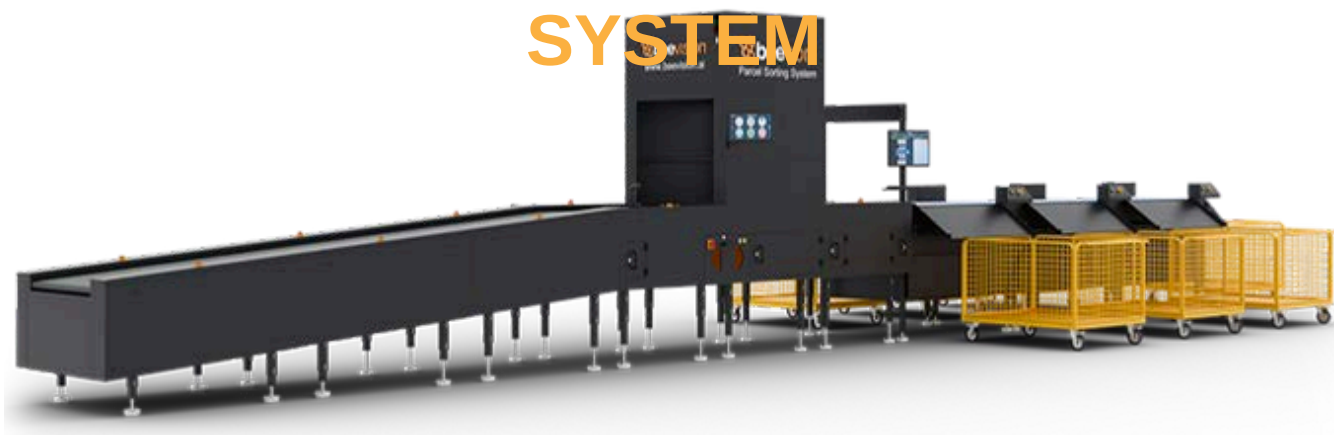




# WAREHOUSE 4.0 SOLUTIONS

## BARCODE/DATA & CUBIC SCANNING SYSTEMS

### PARCEL SORTING SYSTEM



- Up to 5K boxes sorted per hour
- OCR address extraction from labels
- Dynamic programmable sorting functions
- Software integration

### MASTER DATA ANALYSER



- 3D light curtain image processing
- 0.5cm accuracy dimensioning
- 1K objects per hour
- Software integration
- Integrated scale
- Touchscreen user interface

### STATIC PALLET DIMENSIONING SYSTEM

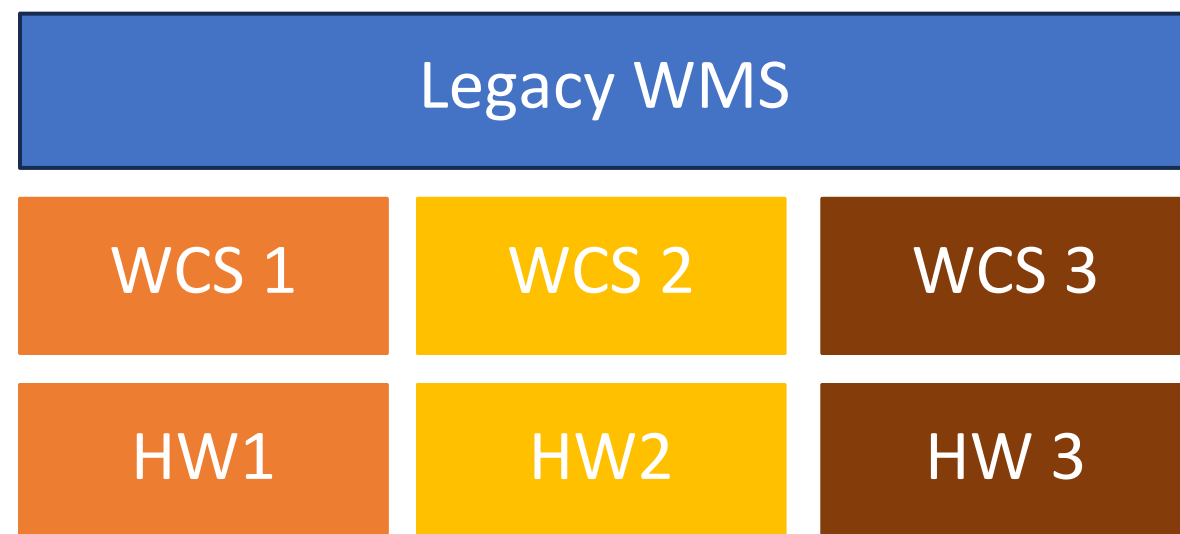


- 2 second measuring process
- 2cm accuracy dimensioning
- 3 3D camera system
- Touchscreen & scale monitoring
- Integrated scale
- Seamless integration

# WAREHOUSE 4.0 SOLUTIONS

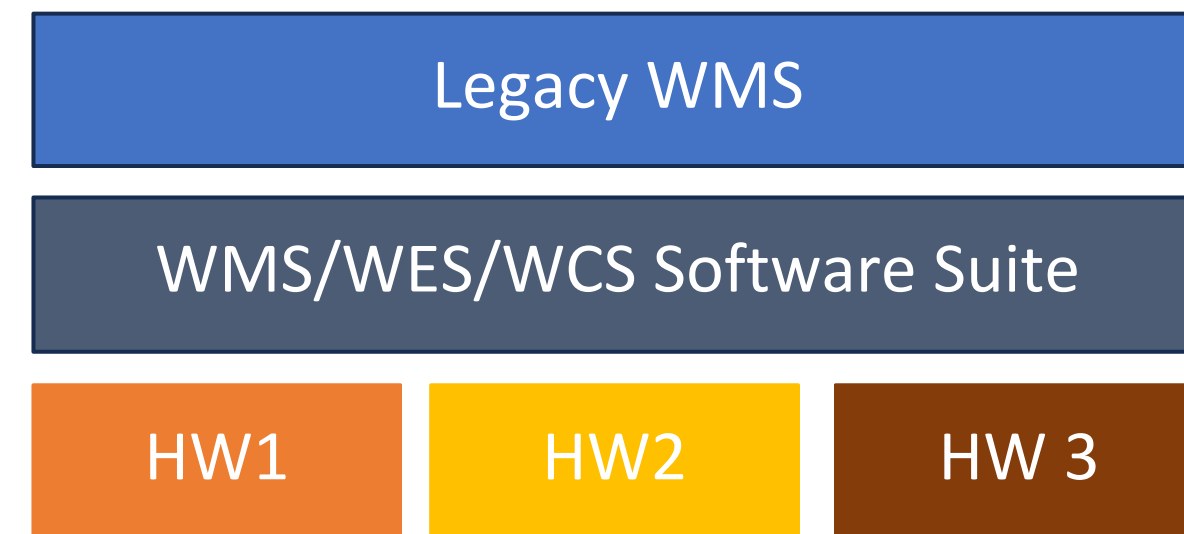
## AGNOSTIC TECHNOLOGY ORCHESTRATION

### Traditional Model



- X Multi-OEM Hardware and Software, leads to upgrade and integration challenges**
- X Multiple Silos, redundant operations and lack of accountability**
- X No useful data collection**
- X Scattered inventory & minimal operational visibility**

### Norbac's Approach



- **Multi-OEM Hardware & Single Core Software Platform**
- **Fully flexible and functional WMS, WES and WCS – All in One.**
- **Reconfigurable, modular and scalable**
- **Single vendor responsibility, across Process, Optimization and Hardware**
- **Real-time visibility and management of entire operation**
- **Data collection and analytics**
- **Future-proofed technology investment**

# WAREHOUSE 4.0 SOLUTIONS

## AGNOSTIC TECHNOLOGY ORCHESTRATION

**Microservices Based Architecture**  
**Cutting Edge**  
*Kubernetes and Jenkins backend*

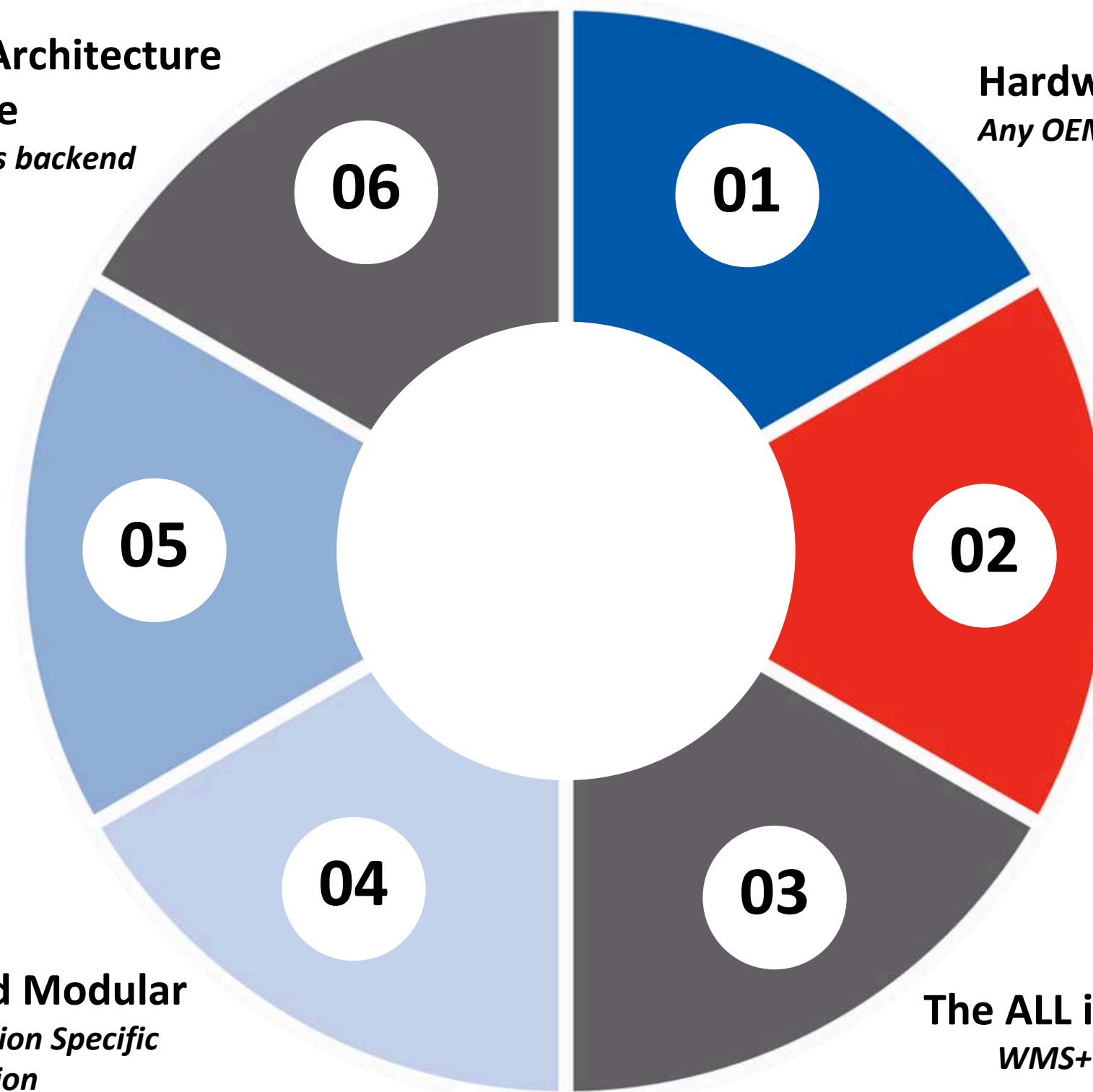
**Hardware Agnostic Software**  
*Any OEM, Any Configuration or Setting*

**Proven Across Industries**  
*Fashion, Food, Retail and Manufacturing*

**The ALL in ONE Platform**  
*WMS+WCS+WES+FMS*

**Configurable and Modular**  
*Workflow and Solution Specific*  
*Customization*

**Hybrid Architecture**  
**Cloud + On Prem**





# WAREHOUSE 4.0 SOLUTIONS

## AGNOSTIC TECHNOLOGY ORCHESTRATION

### Warehouse Execution System

Executes, monitors, and reports every task performed by all fixed and mobile automated hardware

### Warehouse Management System

Manages all inventory at every stage of the intralogistics operation

## Hardware Agnostic, Robust & Scalable Software Platform



### Warehouse Control System

Controls, coordinates, and monitors the operation of all automated hardware

### Fleet Management System

Creates, executes, and monitors all tasks for every automated mobile hardware

Orchestrating all automated hardware independent of manufacturer to create intelligent intralogistics ecosystems with decision-making capabilities.



# WHY PARTNER WITH US?



## Dedicated Support

- Qualified Professionals
- Documentation
- Ramp Up Support
- PM Monitoring



## Discover

- Product
- Process
- People
- Challenges
- Objectives



## Deliver

- Project Management
- Configurable Software
- Digital Twin
- World-Class OEM Partners



## Design

- Technology Selection
- Layout Engineering
- Simulation
- Process Re-engineering



# WHY PARTNER WITH US?



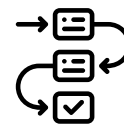
## Inception

- Scope management
- I-KOM/E-KOM
- DAP (Design Acceptance Package)



## Plan

- Cost and SOW visibility
- Dynamic project schedule
- Risk identification and mitigation



## Implement

- Resource deployment
- Daily, monthly, weekly reporting with S-curve
- Virtual commissioning
- FAT
- Effective conflict and crisis management



## Adapt

- Change management and knowledge management



## Closure

- Sign-off and handover
- Unit & Integrated testing
- Documentation



**Customer-centric approach**



**Advanced scheduling tools and platforms**



**Agile team**



**Safety Compliance**





# **NORBAC**

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