



# High-Density Warehouse Automation for Smart Manufacturing & Logistics

## Four-Way Shuttle ASRS

A scalable automated storage solution enabling high-density pallet handling, flexible layouts, and efficient warehouse operations.



## Corporate Overview



UB Penang (HQ)



UB Kuala Lumpur



UB Ipoh



UB Shanghai



UB Nantong

UB is a leading provider of Smart Manufacturing and Warehouse Automation solutions with more than 30 years of innovation. Specialising in industry automation, UB empowers organisations to achieve higher efficiency, precision, and sustainability through digital backbone technologies, material flow systems, warehouse automation, and AI-driven solutions.

Through its Smart Manufacturing & Warehouse Ecosystem, UB delivers end-to-end automation across industries such as Automotive, Medical, Semiconductor, Electronics, and Warehousing & Logistics. Recognised as a pioneer in lights-off automation with successful large-scale deployments for global manufacturers, UB continues to advance Industry 4.0 through innovation, engineering excellence, and dedicated R&D.

### 30+ Years of Innovation

Deep domain expertise driving measurable efficiency gains in manufacturing and automation.

### Pioneers in Lights-Off Automation

Among the first with real-world lights-off back-end line deployments.

### Smart Manufacturing & Warehouse Ecosystem

Seamlessly uniting digital backbone, material flow, warehouse automation, and robotics into a powerful, integrated solution.

## Key Accomplishments & Recognitions

ISO 9001:2015 Certified

Malaysia Digital (MD) Status Company

Technology Excellence Award, Malaysia Smart Manufacturing Awards (MSMA) 2025

Tribute 30 Industry Leaders Award Nominee, SEMICON SEA 2025, Singapore

INPenang International Award for Excellence in Industrial Automation

National Technology Solution Provider, recognized by MIDF

CHT Excellence Award for I4.0 Solution Provider

STATSChipPAC Gold Award for Epoxy Tooling Management System (ETMS)

Awarded for Innovation and Support in the Lights-Off Manufacturing Journey with Western Digital

Delivered one of the first lights-off semiconductor backend lines with SanDisk Shanghai

## How the UB Smart Ecosystem works



Connects machines, data, and workflows seamlessly



Automates material movement to enhance productivity and safety



Tracks inventory and optimizes storage with real-time visibility



Seamlessly uniting the digital backbone into a powerful, integrated solution.



Synchronizes control across production and warehouse systems



Scales easily to maximize operational efficiency

# Four-Way Shuttle ASRS

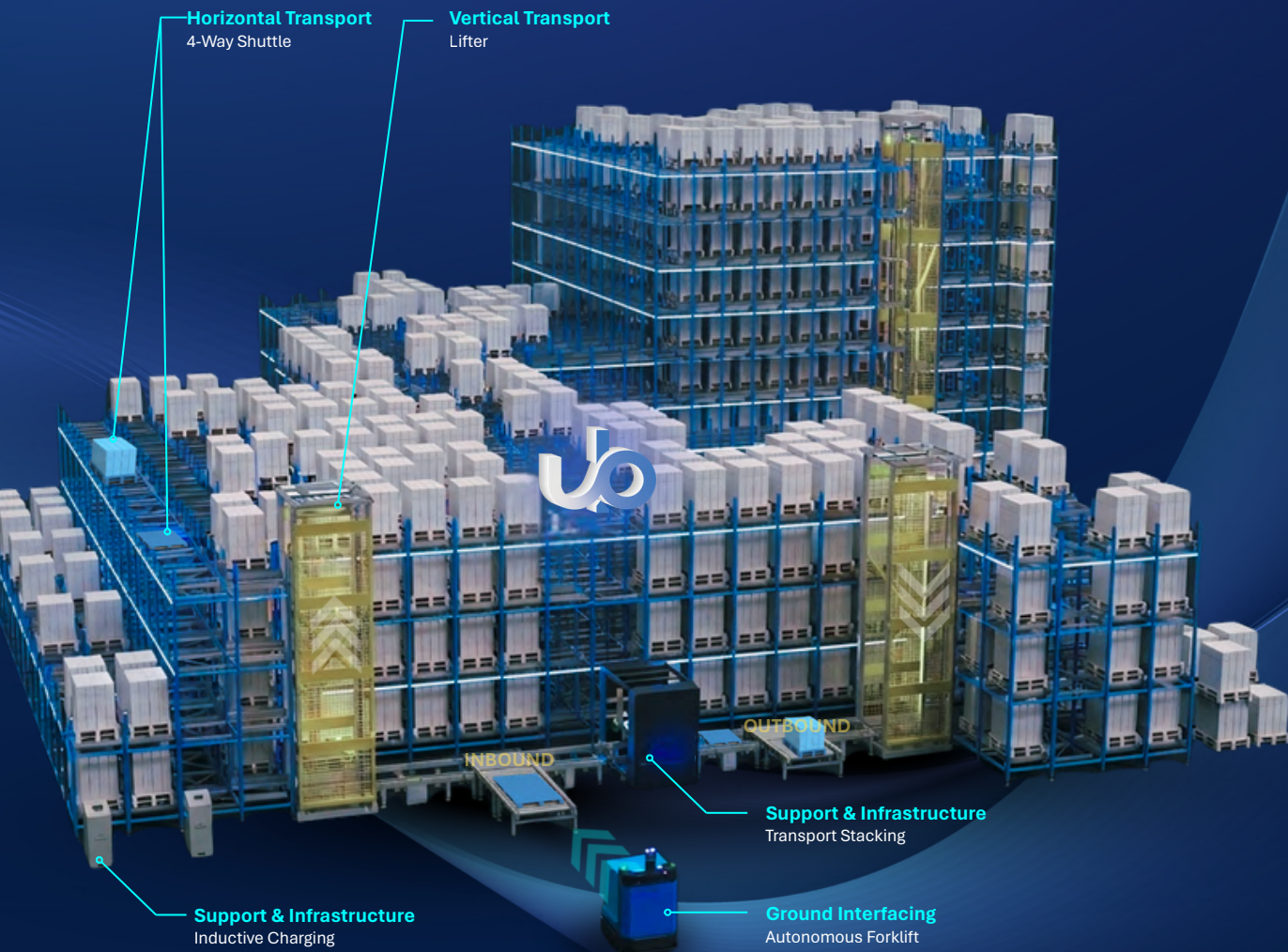
## Accelerating High-Throughput Warehouse Operations

A high-density storage solution that utilizes autonomous robotic carts to transport pallets within a specialized racking structure. By enabling shuttles to travel in four directions, the system provides superior routing flexibility and efficiency.

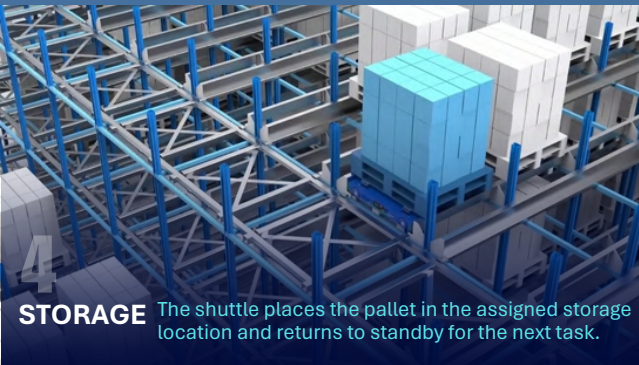
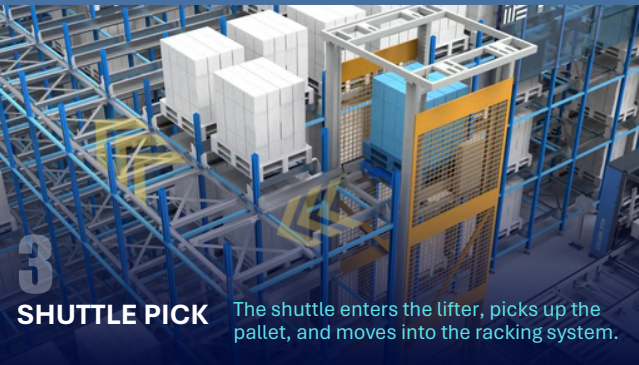
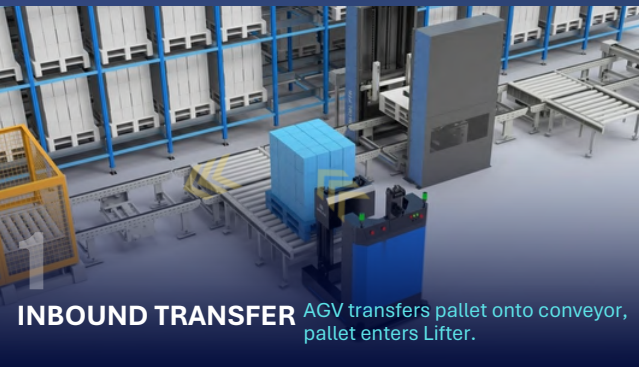
- **Multi-depth Flexible Layouts** supporting adaptable warehouse design and optimized storage capacity.
- **High-density Space Utilization** with scalable throughput by adding more shuttle units.
- **Minimal Operational Downtime** with quick shuttle replacement to maintain continuous operations.
- **Strong Seismic Performance** with reduced ground and racking requirements.

## The Evolutionary Leap in Storage Density

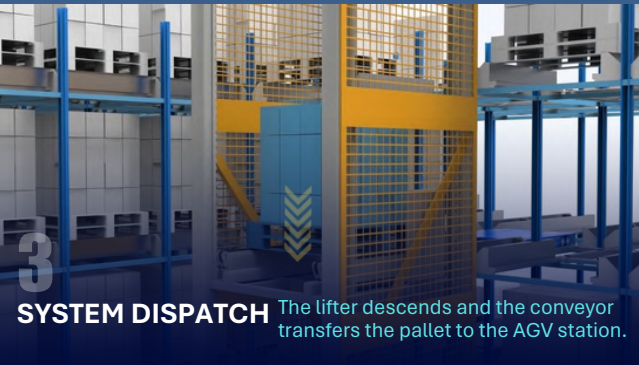
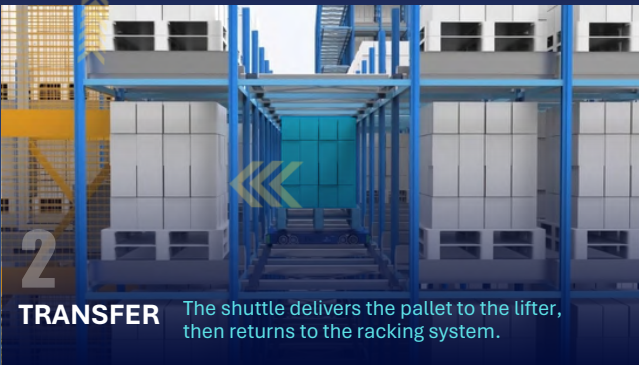
Higher Storage Capacity Within a Fixed Facility Footprint



### STORAGE MODE



### RETRIEVAL MODE



# Four-Way Shuttle

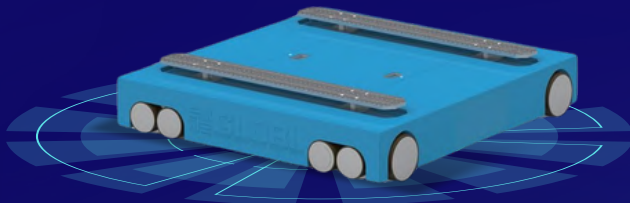
## Autonomous pallet handling in multi-depth racking

The four-way shuttle enables fast horizontal pallet transport with wireless charging capability. Pallet storage and retrieval rates can be increased by adding additional shuttle units.



### PTR-HS

1.2T Rated Load  
140mm profile



### PTR-HW

2.0T Rated Load  
180mm profile



1.2m/s driving speed



6-8 hours Endurance



The four-way shuttle moves pallets within high-density racking, maximizing storage capacity while improving safety by eliminating forklift movement in storage aisles.



# Lifter

## Optimized pallet transfer for high-speed lifter operations

### PTR-VS

The lifter enables efficient vertical movement of pallets between different rack levels, coordinating seamlessly with shuttle operations to support inbound and outbound material flow.



#### Precise Vertical Movement

Servo motor drive maintains accurate lifting and lowering operations.



#### Stable High-Load Performance

Rack and pinion drive improves safety and sharply reduces structural subsidence.



#### Versatile Configuration

Supports multiple system layouts including one-way, two-way, or multi-elevator configurations.



0.6m/s lifting speed



2.5T Rated Load



## Specification

|             |                                |                                                                                    |                        |                                                                                     |                        |                                                                                     |                                       |
|-------------|--------------------------------|------------------------------------------------------------------------------------|------------------------|-------------------------------------------------------------------------------------|------------------------|-------------------------------------------------------------------------------------|---------------------------------------|
|             |                                | Normal Room Temp. Equipment                                                        |                        | Cold Room Temp. Equipment                                                           |                        |                                                                                     |                                       |
|             |                                |  |                        |  |                        |  |                                       |
| MODEL       |                                | PTR-HS                                                                             | PTR-HW                 | PTR-HCS                                                                             | PTR-HCW                | MODEL                                                                               | PTR-VS                                |
| BASIC SPEC  | Net Weight                     | 300KG                                                                              | 450KG                  | 310KG                                                                               | 450KG                  | Net Weight                                                                          | ≥ 4.5 T                               |
|             | Rated Load                     | 1.2 T                                                                              | 2 T                    | 1.2 T                                                                               | 1.5 T                  | Rated Load                                                                          | ≤ 2.5 T                               |
|             | Overall Dimension (L×W×H)      | 1135×980×146mm                                                                     | 1135×980×180mm         | 1135×980×146mm                                                                      | 1135×980×180mm         | Overall Dimension (L×W×H)                                                           | 2223×1720mm<br>Customized per project |
| PERFORMANCE | Driving Speed                  | 1.2 m/s                                                                            | 1.2 m/s                | 1.2 m/s                                                                             | 1.2 m/s                | Driving Speed                                                                       | 0.6 m/s                               |
|             | Acceleration                   | 0.3 m/s <sup>2</sup>                                                               | 0.2 m/s <sup>2</sup>   | 0.3 m/s <sup>2</sup>                                                                | 0.2 m/s <sup>2</sup>   | Lifting Time                                                                        | N/A                                   |
|             | Lifting Time                   | 3 s                                                                                | 4 s                    | 3 s                                                                                 | 4 s                    | Reversing Time                                                                      | N/A                                   |
|             | Reversing Time                 | 3 s                                                                                | 4 s                    | 3 s                                                                                 | 4 s                    | Accuracy of Positioning                                                             | ± 2 mm                                |
|             | Accuracy of Positioning        | ± 2 mm                                                                             | ± 2 mm                 | ± 2 mm                                                                              | ± 2 mm                 |                                                                                     |                                       |
| BATTERY     | Battery Type                   | Lithium Iron Phosphate                                                             | Lithium Iron Phosphate | Lithium Iron Phosphate                                                              | Lithium Iron Phosphate | Voltage                                                                             | AC 380 + AC 220                       |
|             | Battery Performance            | ≥ 2.8 kwh                                                                          | ≥ 2.3 kWh              | ≥ 2.8 kWh                                                                           | ≥ 2.3 kWh              | Noise Value                                                                         | ≤ 75 dB                               |
|             | Endurance Time                 | 8 h                                                                                | 6~8 h                  | 6 h                                                                                 | 5~7 h                  | Acceleration                                                                        | 0.3 m/s <sup>2</sup>                  |
|             | Charging Time                  | ≤ 2 h                                                                              | ≤ 3 h                  | ≤ 2 h                                                                               | ≤ 3 h                  | Capacity                                                                            | 12 kW                                 |
|             | Cycle Charge & Discharge Times | 2000 times                                                                         | 2000 times             | 2000 times                                                                          | 2000 times             | Control Mode                                                                        | Servo                                 |
|             | Charging Mode                  | Inductive Charging                                                                 | Inductive Charging     | Inductive Charging                                                                  | Inductive Charging     | Operating Temperature                                                               | -25 ~ 45 °C                           |
|             | Applicable Temperature         | -10 ~ 45 °C                                                                        | -10 ~ 45 °C            | -25~ 0 °C                                                                           | -25~ 0 °C              |                                                                                     |                                       |
|             | Battery Display                | ✓                                                                                  | ✓                      | ✓                                                                                   | ✓                      |                                                                                     |                                       |
| SAFETY      | Laser Obstacle Avoidance       | ✓                                                                                  | ✓                      | ✓                                                                                   | ✓                      | Laser Obstacle Avoidance                                                            | N/A                                   |
|             | Smoke Detection                | Optional                                                                           | Optional               | Optional                                                                            | Optional               | Smoke Detection                                                                     | N/A                                   |
|             | Temperature Detection          | Optional                                                                           | Optional               | Optional                                                                            | Optional               | Temperature Detection                                                               | N/A                                   |
|             | Emergency Stop Button          | ✓                                                                                  | ✓                      | ✓                                                                                   | ✓                      | Emergency Stop Button                                                               | ✓                                     |
|             | Pallet Detection               | ✓                                                                                  | ✓                      | ✓                                                                                   | ✓                      | Pallet Detection                                                                    | ✓                                     |
|             | Audible Alarm                  | ✓                                                                                  | ✓                      | ✓                                                                                   | ✓                      | Audible Alarm                                                                       | ✓                                     |

Specifications may vary depending on project configuration and application requirements.

Success Story

# High-Density Warehouse Automation with Autonomous Forklifts



Summary

UB deployed a Four-Way Shuttle Cart Solution to automate warehouse storage operations, enabling high-density pallet storage, flexible pallet movement, and efficient material transfer within the manufacturing facility.

Business Challenges

- Narrow warehouse aisles limiting safe and efficient forklift operations
- High-density racking requiring precise pallet handling
- Continuous production requiring reliable and consistent material flow
- Safety risks and congestion from forklift traffic in storage aisles

Solutions

- A semi-automated storage system utilizing four-way shuttle carts within a high-density racking structure
- Cost-effective design maximizing storage capacity within the available warehouse footprint
- Eliminates the need for forklifts to enter storage aisles, improving safety and operational efficiency

Results

- Maximized storage capacity by utilizing the full warehouse floor space
- Improved operational accuracy, productivity, and overall supply chain efficiency
- Full traceability and audit trail capability
- Real-time inventory visibility

Industry

Electrical & Electronics

Client Overview

A premier manufacturer of advanced conductive materials. Combining Japanese engineering excellence with global distribution, the company delivers high-precision solutions for the world’s most demanding electronics and automotive industries.

“

Where Storage Density Redefines Warehouse Performance.

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#### **About UB Group**

UB is a leading Smart Manufacturing and Warehouse Automation solutions provider with more than 30 years of innovation. Specialising in industry automation, UB empowers organisations to achieve higher efficiency, precision, and sustainability through digital backbone technologies, material flow systems, warehouse automation, and AI-driven solutions.

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