AUTOMATED RECIPROCATING LIFT & CONVEYOR SYSTEM

Premium Engineering Case Study

Zhejiang Libang Hexin Intelligent Brake Systems Co., Ltd.

Customer & Industry Background

The customer is a leading automotive brake system manufacturer. Production lines require continuous movement of pallets, components, and finished products between floors while maintaining traceability, safety, and production efficiency.

Industry Pain Points

• Forklift traffic creates congestion and safety risks.
• Manual floor-to-floor transfer reduces throughput.
• Limited installation space restricts logistics layouts.
• Different pallet sizes complicate automation.
• Production downtime directly impacts manufacturing output.

Project Challenges

No pit available, 7 m vertical travel, Z-shaped loading/unloading path, high-speed operation, automated conveyor integration, and compatibility with both 1150×1150 mm and 1200×800 mm pallets.

Technical Configuration

Capacity: 1000 kg
Travel Height: 7000 mm
Lift Speed: 0–60 m/min VFD Control
SEW Geared Motor with Brake
Siemens PLC + HMI
PVC High-Speed Doors
Dual Safety Gear System
Automatic Conveyor Transfer

Workflow Analysis

Second-Floor Infeed → Height Adjustment Conveyor → Bridge Conveyors → 90° Transfer → Transition Conveyor → 90° Transfer → Vertical Lift → Ground-Floor Conveyor → Forklift Collection.

Working Principle

Sensors detect pallet arrival and dimensions. The PLC coordinates conveyors and transfer units. The pallet enters the lift cabin automatically. The reciprocating lift transports the load vertically. Upon arrival, the cabin conveyor automatically transfers the pallet to the discharge conveyor without operator intervention.

Why Reciprocating Lift?

Compared with conventional freight elevators, reciprocating lifts offer higher cycle frequency, easier conveyor integration, lower civil construction requirements, and better suitability for automated intralogistics systems.

Safety Design

Safety gears, light curtains, interlocked rapid doors, emergency stop circuits, overload protection, anti-fall mechanisms, and PLC monitoring ensure reliable operation.

Customer Benefits

Higher throughput, reduced labor cost, improved safety, continuous production flow, lower maintenance requirements, and future-ready automation architecture.

Project Value

The project transformed a conventional material transfer process into a smart logistics solution capable of supporting modern manufacturing and future factory expansion.