

# Revolutionizing Cold Chain Logistics with ISDN WMS + Cold Chain AGV

Maximize Efficiency and Integrity in Cold Storage Below -25°C with Intelligent Automation

## Addressing the Pain Points in Cold Chain Logistics

Maintaining consistent temperatures is crucial for preventing spoilage and ensuring the integrity and safety of perishable goods like pharmaceuticals and fresh food. Harsh conditions in cold storage environments below 25°C make it difficult to attract and retain workers, while ensuring safety in slippery and cold conditions is a significant challenge. Efficient space utilization is essential to maximize storage capacity and maintain optimal temperature control, but poor organization can lead to inefficiencies and increased handling times. Additionally, the lack of real-time visibility into the supply chain can cause delays and inefficiencies, complicating inventory management and timely deliveries.

 <p><b>TEMPERATURE CONTROL AND MONITORING</b> Maintaining the correct temperature throughout the supply chain is critical for the integrity of perishable goods. Any fluctuation can lead to spoilage, especially for pharmaceuticals and fresh food products.</p>	 <p><b>LABOR SHORTAGES AND SAFETY</b> Cold storage environments are harsh, leading to difficulties in attracting and retaining workers. Ensuring worker safety in these environments, where conditions can be slippery and cold, is also a major concern.</p>	 <p><b>INVENTORY MANAGEMENT AND SPACE UTILIZATION</b> Efficient use of space is crucial in cold storage to maximize capacity while maintaining optimal temperature control. Overcrowded or poorly organized storage can lead to inefficiencies and increased handling times.</p>	 <p><b>REAL-TIME DATA AND VISIBILITY</b> Lack of real-time visibility into the supply chain can lead to delays and inefficiencies. Without accurate data, managing inventory and ensuring timely deliveries become challenging.</p>
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## Your Solution: ISDN WMS + Cold Chain AGV

### Comprehensive Solution

1. Cloud-based system for managing real-time warehouse operations.
2. Includes inventory control, receiving, put away, replenishment, picking, and shipping.
3. Decision automation, barcode system, and voice picking to enhance operational efficiency.
4. Utilizes IoT devices and robotics for seamless data flow and system interoperability.

### Advanced Storage Solution

1. 4-Way Pallet Shuttle designed for high-density cold storage.
2. Operates efficiently in extreme cold conditions, below 25°C
3. Ensures the integrity and safety of temperature-sensitive products.
4. Capable of moving pallets in four directions, optimizing space utilization.
5. Maximizes storage capacity with high-density configurations

## Why Choose ISDN?

### Real-Time Data and Analytics:

- Provides comprehensive visibility into inventory levels and storage conditions.
- Supports quick, informed decision-making with real-time data analytics.

### Enhanced Operational Efficiency

- Automates pallet handling, reducing labor costs and minimizing human error.
- Streamlines warehouse operations for increased productivity



# Use Case: The Smart Upgrade of Japanese Cold Storage Facilities

## Background

As the cold chain logistics market grows, the demand for specialized storage for fresh food and agricultural products is increasing. The pandemic accelerated this trend, with fresh food platforms seeing explosive growth and driving a surge in cold chain warehousing. Major food companies now require more advanced informatization of cold chain logistics. Consequently, the industry faces an urgent need for intelligent and digitized transformation.

## Challenges

- Low space utilization.
- Low efficiency of manual operations.
- High requirements for warehouse stability and cleanliness.
- Adverse working conditions affecting health and difficulty in hiring workers.

## Solution with ISDN

- Construction of a 325 square meter cold storage facility with 4 levels and 296 storage positions.
- Deployment of three cold chain automated guided vehicles (AGVs) and a comprehensive software system including Warehouse Management System (WMS), Warehouse Execution System (WES), Warehouse Control System (WCS), and Robotic Control System (RCS).
- Use of pallets with dimensions of 1100mm x 1100mm x 130mm.

## Results

- Establishment of a multi-deep cold storage dense automated facility, resulting in a 50% increase in space utilization.
- Operation at temperatures as low as -25°C with a speed of 1.4m/s, doubling efficiency and providing robust support for food preservation.
- Fully automated and unmanned operation, reducing personnel access and ensuring a stable temperature and humidity environment within the cold storage.
- Battery life of 6-8 hours on a full charge, effectively replacing manual labor and addressing the labor shortage issue in cold storage.

