Case Study: Warehouse Pallet Dimension Verification (Pakistan)

GIBES INOV – Automation and Quality Control for Logistics

Industry Overview

In the logistics and warehousing sector, compliance with carrier dimension standards is critical. Oversized pallets not only incur fines but can cause:

- Delays in distribution
- Increased transportation costs
- Damage to goods or handling equipment

Traditional manual verification methods are prone to errors and slow processing speeds, increasing operational risk.

Client Background

A major distribution center in Pakistan was manually measuring pallet dimensions before shipment. The process had several limitations:

- High incidence of missed oversized pallets
- Carrier fines exceeding $50,000 annually
- Slow verification (1 minute per pallet)
- No audit trail for compliance or quality reporting

Key Metrics

Metric	Before GIBES INOV	After GIBES INOV	Res
Annual Pallet Rejection Fines	$50,000+	$0	100% F
Verification Speed	Manual (1 min/pallet)	Automated (3 sec/pallet)	1900%
Quality Audit Trail	None	Full log (Pass/Fail, Dimensions)	Comple

Challenges & Constraints

The primary challenges included:

- Manual measurement prone to human error.
- High throughput of pallets requiring fast verification.
- Need for real-time rejection mechanism for oversized pallets.
- Requirement to maintain complete audit trail for compliance reporting.

GIBES INOV Solution Architecture

Hardware Setup

The automation system deployed:

- Industrial-grade laser distance sensors (LIDAR) mounted above the conveyor line.
- Compact PLC (Siemens S7-1200) for high-speed data processing.
- Mechanical diversion arm to automatically reject oversized pallets.

Control Logic

The PLC executes real-time dimension verification:

- Captures pallet length, width, and height using LIDAR sensors.
- Compares dimensions against predefined thresholds.
- Triggers mechanical arm to divert non-compliant pallets automatically.

Data Visualization & Audit

- Local HMI displays real-time Pass/Fail status.
- All pallet measurements logged for monthly compliance reports.
- Enables management to identify trends in pallet size issues.

Deliverables

- Laser sensor and mounting installation.
- PLC program for automated dimension verification.
- Integrated mechanical rejection mechanism.
- HMI dashboard and monthly audit logging system.

Implementation Timeline

- **Week 1–2:** Site survey, requirement definition, electrical design.
- **Week 3–4:** Hardware installation and PLC programming.
- **Week 5:** HMI setup and system integration.
- **Week 6:** Commissioning, testing, and final validation.

Results & Impact

- Eliminated annual carrier fines ($50,000+).
- Increased verification speed by 1900%.
- Automated audit trail enabled complete regulatory compliance.
- Reduced human error and improved warehouse throughput.

About GIBES INOV

GIBES INOV specializes in industrial automation, IoT integration, and quality control systems for logistics, manufacturing, and R&D sectors across Pakistan and Europe. Our solutions emphasize reliability, cost-effectiveness, and measurable ROI.