

Cold Chain Tracking and Monitoring Market - Forecast from 2026 to 2031

<https://marketpublishers.com/r/C07CA553A315EN.html>

Date: January 2026

Pages: 144

Price: US\$ 3,950.00 (Single User License)

ID: C07CA553A315EN

Abstracts

Cold Chain Tracking And Monitoring Market, growing at a 9.82% CAGR, is expected to grow to USD 14.119 billion in 2031 from USD 8.050 billion in 2025.

Cold chain tracking and monitoring systems integrate IoT sensors, RFID, cellular/LoRaWAN connectivity, and cloud-based analytics to deliver real-time visibility of temperature, humidity, location, and shock across the entire supply chain for perishable and temperature-sensitive products. These solutions have evolved from simple data loggers to predictive platforms that trigger proactive interventions, ensure GDP/GSP compliance, and generate immutable audit trails for regulators and insurers. The market is experiencing structural growth as pharmaceutical, biologic, and high-value food supply chains demand end-to-end transparency in an increasingly globalized and multi-modal environment.

Core Growth Drivers

1. Explosive growth in temperature-sensitive pharmaceuticals and biologics The rapid expansion of vaccines, insulin, monoclonal antibodies, cell & gene therapies, and oncology drugs—all requiring strict 2–8 °C or cryogenic control—has made cold chain failure financially and clinically unacceptable. Even minor excursions can render multi-million-dollar batches unsalable, driving mandatory adoption of real-time monitoring across clinical-trial, commercial, and last-mile networks.
2. Warehouse automation and multi-zone visibility requirements Modern distribution centers now operate multiple discrete temperature zones (−80 °C to +25 °C) within a single facility. Automated storage & retrieval systems (AS/RS), shuttle robots, and autonomous mobile robots (AMRs) require continuous sensor feedback to validate zone

integrity and prevent product migration errors, while simultaneously optimizing energy and labor costs.

3. Regulatory and quality-standard escalation Stringent GDP guidelines (EU 2013/C 343/01, WHO Annex 9, USP), IATA TCR for time- and temperature-sensitive healthcare products, and FSMA Rule 204(d) traceability mandates are pushing shippers toward validated, calibrated IoT systems capable of lane risk mapping, predictive excursion alerts, and digital CoC (Certificate of Conformance).

4. Convergence of IoT, RFID, and edge analytics Low-cost NB-IoT/LTE-M networks, battery-powered 5–10 year sensors, and edge-enabled gateways now permit cost-effective monitoring of individual pallets and parcels without infrastructure overhauls. Integration with blockchain and AI-driven predictive ETA models further reduces waste and claims.

Key Restraints

High upfront capex and network deployment costs Full-coverage solutions (sensors, gateways, cloud subscriptions, validation) remain prohibitive for SMEs and low-margin commodity segments, often exceeding 3–5 % of annual logistics spend.

Installation and operational complexity in fragmented networks Global, multi-modal supply chains routinely involve dozens of hand-offs (air, ocean, road, last-mile courier). Ensuring sensor compatibility, cellular coverage, and data hand-off across stakeholders continues to challenge seamless visibility.

Regional Dynamics

Asia-Pacific has emerged as the fastest-growing and soon-to-be largest region, driven by:

China's dominant pharmaceutical and biologic export growth coupled with strict NMPA and CFDA temperature-control regulations

India's expanding vaccine and generic drug production under compulsory GDP compliance

Southeast Asia's booming processed-food and seafood export sectors

Rapid refrigerated warehouse expansion (China added >15 million m³ of capacity in 2023–2024 alone)

Government initiatives mandating real-time monitoring for certain high-risk products (e.g., China's 2021 vaccine cold-chain traceability requirements) are accelerating adoption beyond voluntary programs.

The cold chain tracking and monitoring market has transitioned from a cost center to a competitive necessity and risk-mitigation investment. Pharmaceutical shippers now view excursion-related losses in the hundreds of millions annually, while food retailers face mounting ESG and waste-reduction pressure. Solutions offering multi-year sensor life, zero-touch onboarding, and predictive analytics integrated into existing TMS/WMS platforms will capture disproportionate share as global supply chains lengthen and regulatory scrutiny intensifies. Asia-Pacific's combination of volume growth and regulatory momentum positions it as the epicenter of near-term market expansion.

Key Benefits of this Report:

Insightful Analysis: Gain detailed market insights covering major as well as emerging geographical regions, focusing on customer segments, government policies and socio-economic factors, consumer preferences, industry verticals, and other sub-segments.

Competitive Landscape: Understand the strategic maneuvers employed by key players globally to understand possible market penetration with the correct strategy.

Market Drivers & Future Trends: Explore the dynamic factors and pivotal market trends and how they will shape future market developments.

Actionable Recommendations: Utilize the insights to exercise strategic decisions to uncover new business streams and revenues in a dynamic environment.

Caters to a Wide Audience: Beneficial and cost-effective for startups, research institutions, consultants, SMEs, and large enterprises.

What do businesses use our reports for?

Industry and Market Insights, Opportunity Assessment, Product Demand Forecasting, Market Entry Strategy, Geographical Expansion, Capital Investment Decisions, Regulatory Framework & Implications, New Product Development, Competitive Intelligence

Report Coverage:

Historical data from 2021 to 2025 & forecast data from 2026 to 2031

Growth Opportunities, Challenges, Supply Chain Outlook, Regulatory Framework, and Trend Analysis

Competitive Positioning, Strategies, and Market Share Analysis

Revenue Growth and Forecast Assessment of segments and regions including countries

Company Profiling (Strategies, Products, Financial Information, and Key Developments among others.

Global Cold Chain Tracking and Monitoring Market is analyzed into the following segments:

By Component

Hardware

RFID Tags

Sensors & Data Loggers

Networking Device

Telematics Devices

Software

By Connectivity

Wi-Fi

Bluetooth

Cellular

RFID

Others

By Logistics Stage

Transportation

Storage & Warehousing

By Application

Pharmaceuticals

Food & Beverage

Chemicals

Others

By Geography

North America

USA

Canada

Mexico

South America

Brazil

Argentina

Others

Europe

Germany

France

United Kingdom

Spain

Italy

Others

Middle East and Africa

Saudi Arabia

UAE

Israel

Others

Asia Pacific

China

India

Japan

South Korea

Indonesia

Thailand

Others

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