

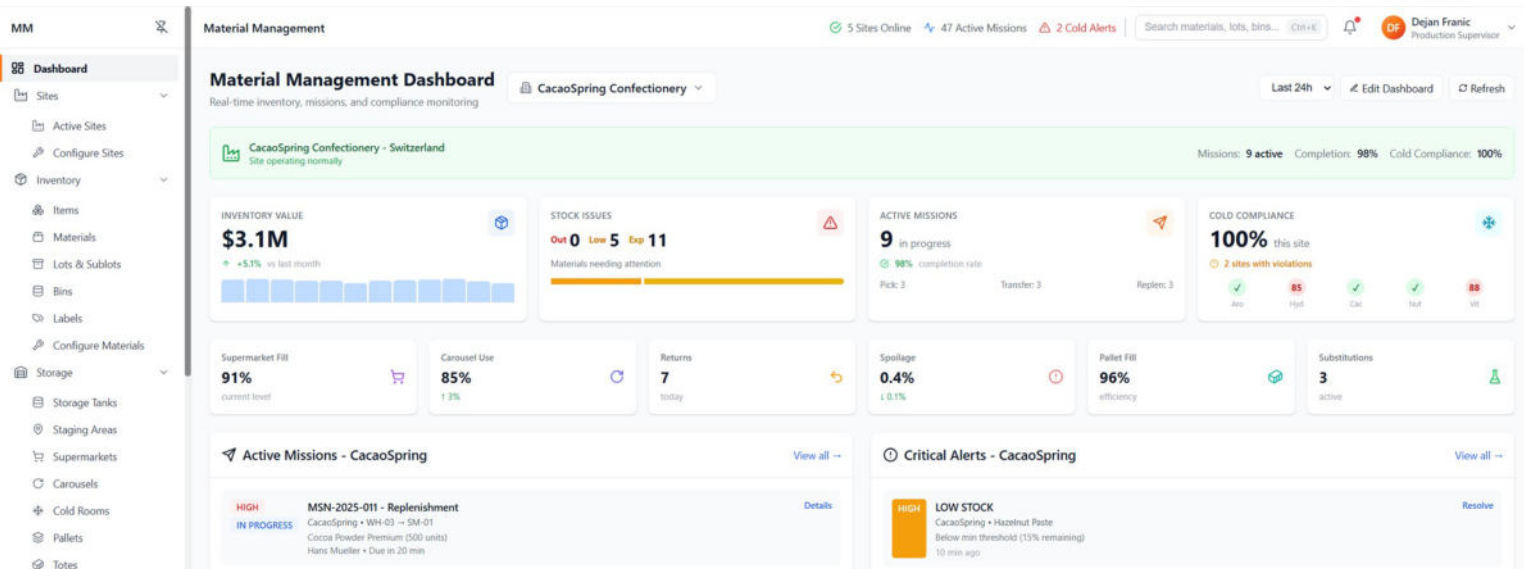


DATASHEET

Material Management

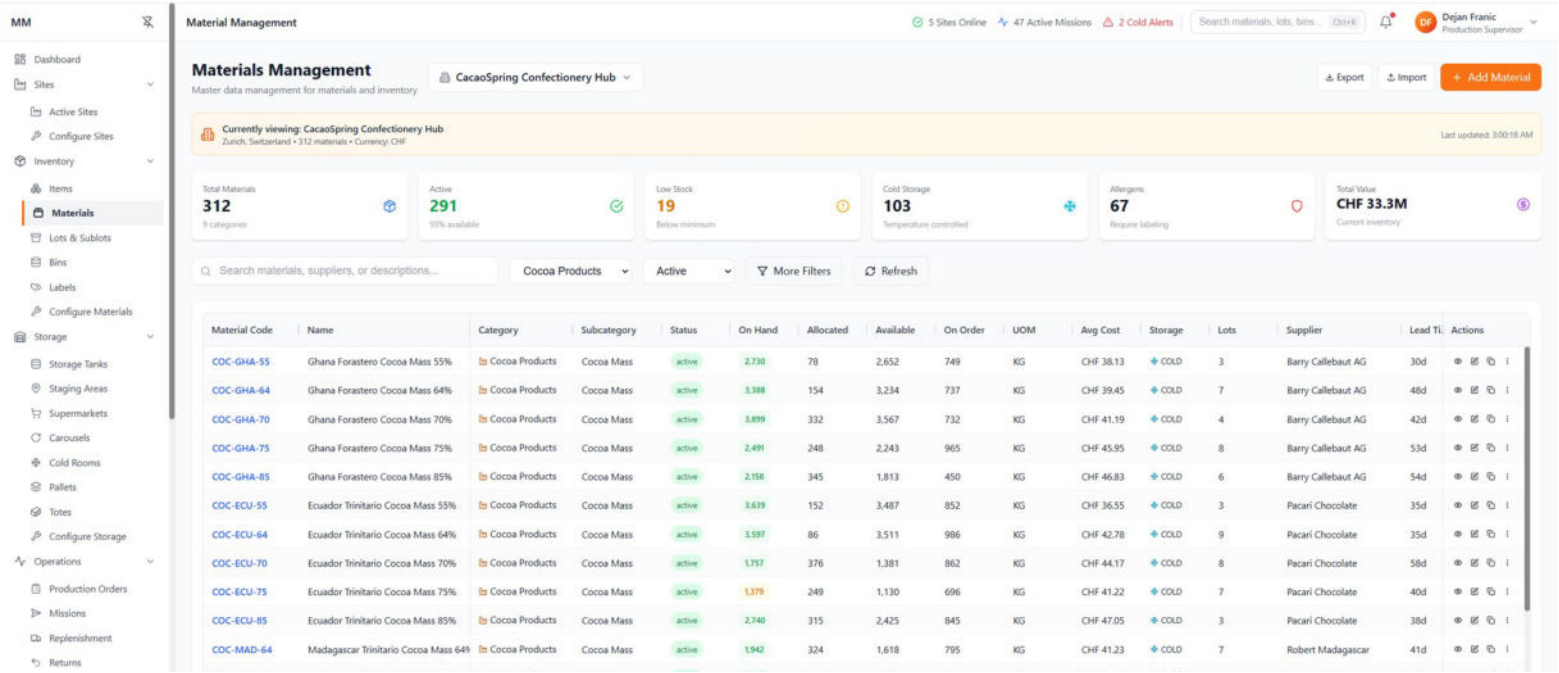
Real-Time Material Control for Regulated, High-Mix Manufacturing.

Manufacturing excellence demands uninterrupted material flow. Line stoppages caused by stockouts, misplaced lots, or uncontrolled environments can cost manufacturers millions in lost productivity, rework, and compliance risk. Traditional spreadsheets, manual calls, and siloed systems leave planners and operators firefighting shortages instead of focusing on value creation. The LOGICAL SYSTEMS Material Management (MM) application transforms material operations from reactive expediting to proactive orchestration. By governing storage, enforcing policies like FIFO/FEFO/LIFO, and continuously planning replenishment, MM ensures the right material is delivered to the right place at the right time predictably, compliantly, and without disruption. Built on the Inductive Automation® Ignition platform, MM integrates seamlessly with production, logistics, and enterprise systems to provide a unified view of material availability and movement.



Unlike conventional WMS or ERP modules that stop at inbound or accounting, MM is designed for in-plant supply chain: supermarkets, carousels, cold rooms, and staging areas. The system orchestrates electronic kanban signals, auto-generates missions for operators or automation, and enforces environmental and withdrawal policies at the point of use. With native connectors, MM exchanges transactions with ERP, WMS, and other systems ensuring cross-functional continuity without data silos. Mobile-first and scanner-driven, MM provides operators with intuitive workflows for receiving, picking, replenishment, and returns either online or offline. Supervisors monitor mission boards and stock levels from dashboards, while executives track KPIs such as Planned vs. Actual (PVA) consumptions, compliance, and spoilage cost. The result is a material management system that not only prevents line starvation but also enforces compliance, reduces waste, and improves responsiveness to change. From electronics and nutrition to specialty chemicals and high-mix assembly, the LOGICAL SYSTEMS MM app delivers the governed material flow that modern, regulated, and just-in-time manufacturers require to compete globally.

Continuous Material Flow Execution Governance, and Analysis on One Platform



Material Intelligence & Storage Governance

- Unique identification of units and carriers (reels, pallets, totes) with expiry, potency, hazard, and substitution rules
- Hierarchical storage model: warehouses, zones, supermarkets, carousels, cold rooms, and line-side buffers
- Policy enforcement at pick time (FIFO, FEFO, LIFO, LEFO, bin priority, environment gates)
- Environmental governance: cold-room monitoring, SMT baking cycles, issue blocks when limits exceeded

Mobile Execution & Integration

- Scanner-first handheld workflows for receiving, putaway, picks, counts, and returns (online/offline)
- Photos, signatures, and operator notes captured at every critical step with audit-ready records
- Seamless integration via LSA Suite of apps including EAI for ERP, WIP, WMS, WD, TMS, OEE, and CMMS
- Executive dashboards for storage zone health metrics, mission cycle times, compliance, and costs

Consumption, Returns & Optimization

- Manual, scanned, or API-driven consumption with potency adjustment for variable-strength materials
- Managed returns (partial packs, opened reels), quarantining, and disposition to scrap or re-issue
- Spoilage capture with cost attribution and audit trail
- Pallet/container optimization with split, merge, and cannibalization rules under approval workflows

Missions, Supermarkets & Carousels

- Electronic kanban signals generate replenishment and transfer missions automatically
- Mission board with priorities, SLAs, progress tracking, and escalation to TMS
- Supermarket min/max thresholds with governed withdrawals and rebalancing rules
- Carousel slot mapping, pick/put sequences, utilization tracking, and controller adapters (with Ignition IO drivers and Integration)

Continuous Material Flow

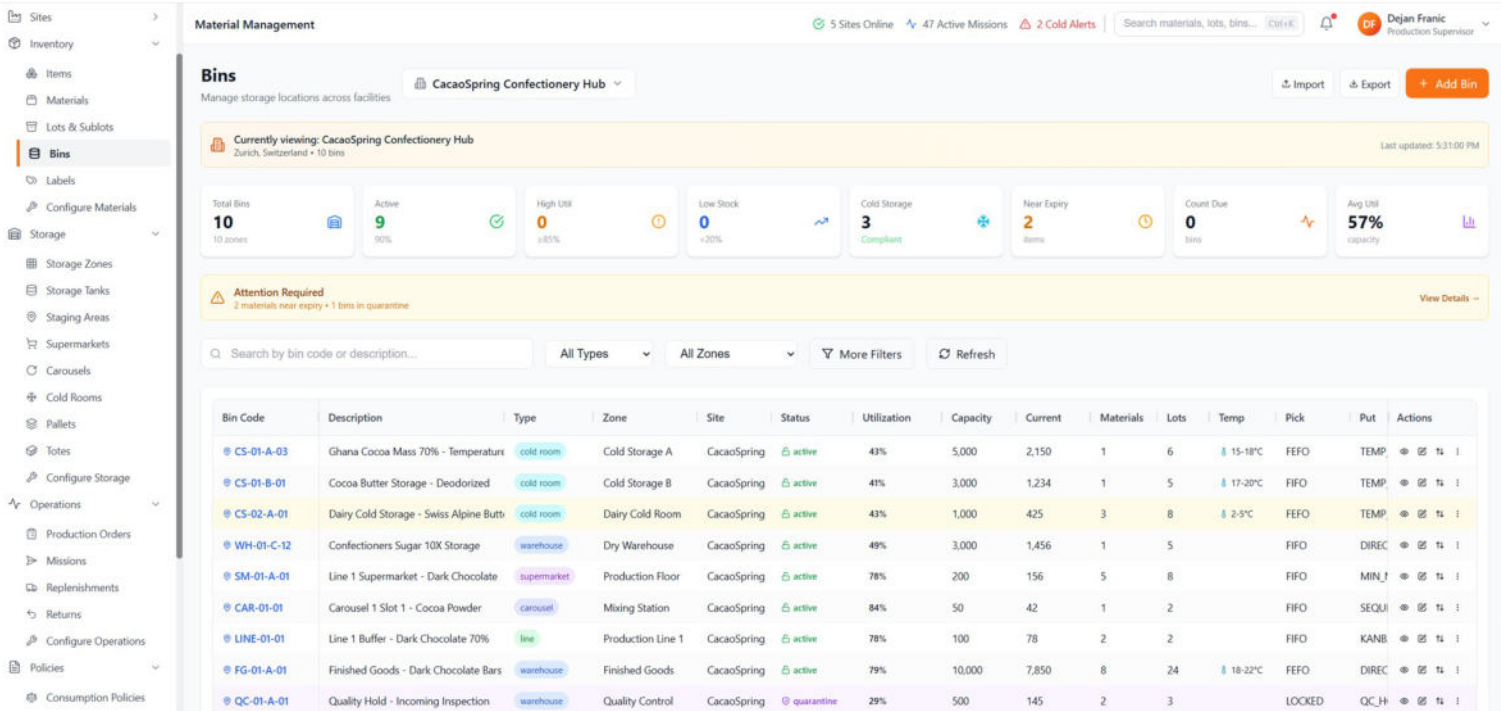
Intelligent material management that maximizes supply continuity.

Analytics & Reporting: The MM app provides real-time dashboards that track critical KPIs including Planned vs. Actual (PVA) consumption, mission cycle time, FEFO compliance, supermarket health, and spoilage or return costs. Inventory accuracy, rebalancing effectiveness, and substitution frequency are visible at site, line, and enterprise levels, enabling managers to identify material risks and improvement opportunities across the organization. Supermarket and carousel utilization reports highlight bottlenecks, while mission performance metrics reveal lead times, fill rates, and exception handling patterns. Advanced analytics surface trends such as repeated shortages or environmental violations, transforming reactive firefighting into continuous improvement. Scheduled report distribution ensures planners, supervisors, and executives receive timely updates on supply performance and compliance without manual intervention.

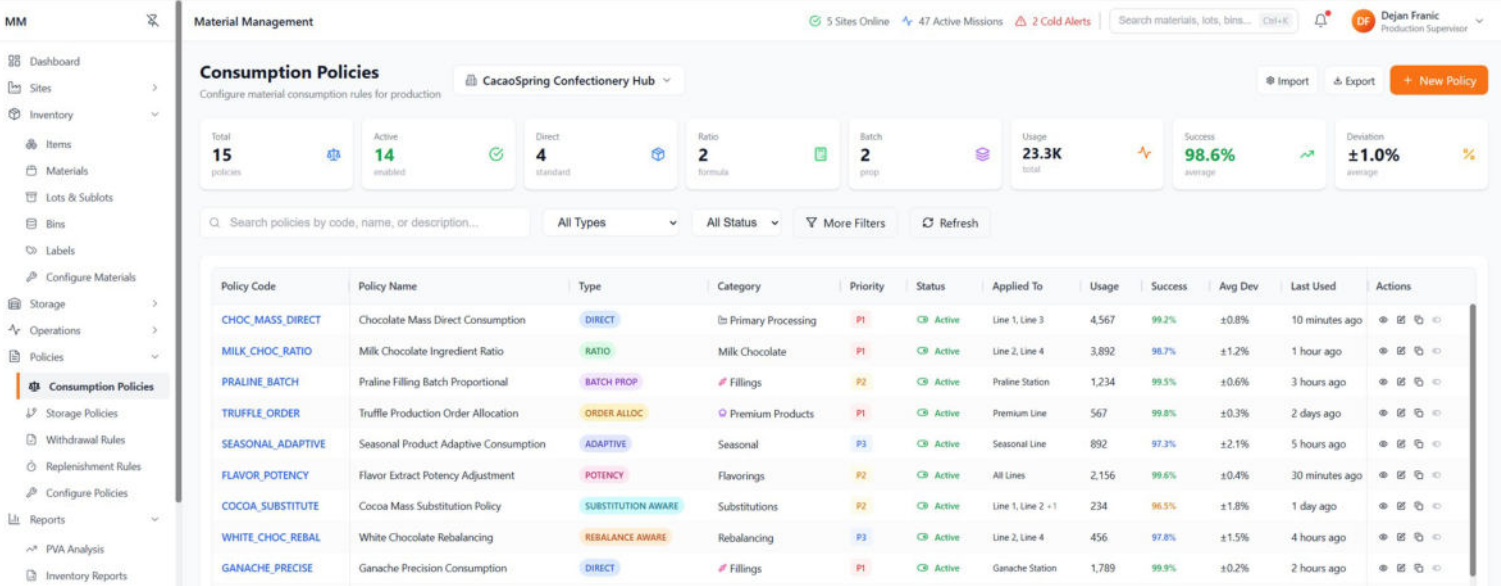
Mobile Capabilities: The system features scanner-first, handheld workflows optimized for operators at docks, supermarkets, and lines. Barcode/QR/Rfid scanning with offline tolerance enables uninterrupted execution even in low-connectivity areas, automatically syncing when reconnected. Photos, signatures, and operator notes are captured directly in replenishment, returns, or spoilage workflows, creating audit-ready records without additional paperwork. Cold-room badges and SMT bake timers are enforced on handhelds, ensuring compliance before material issue. Missions appear in operator queues with priority and SLA indicators, while supervisors monitor progress in real time. Seamless mobile integration reduces errors, accelerates replenishment, and empowers operators to execute governed material policies confidently and efficiently.

Complete, Configurable Engine for Reliable Policy Execution

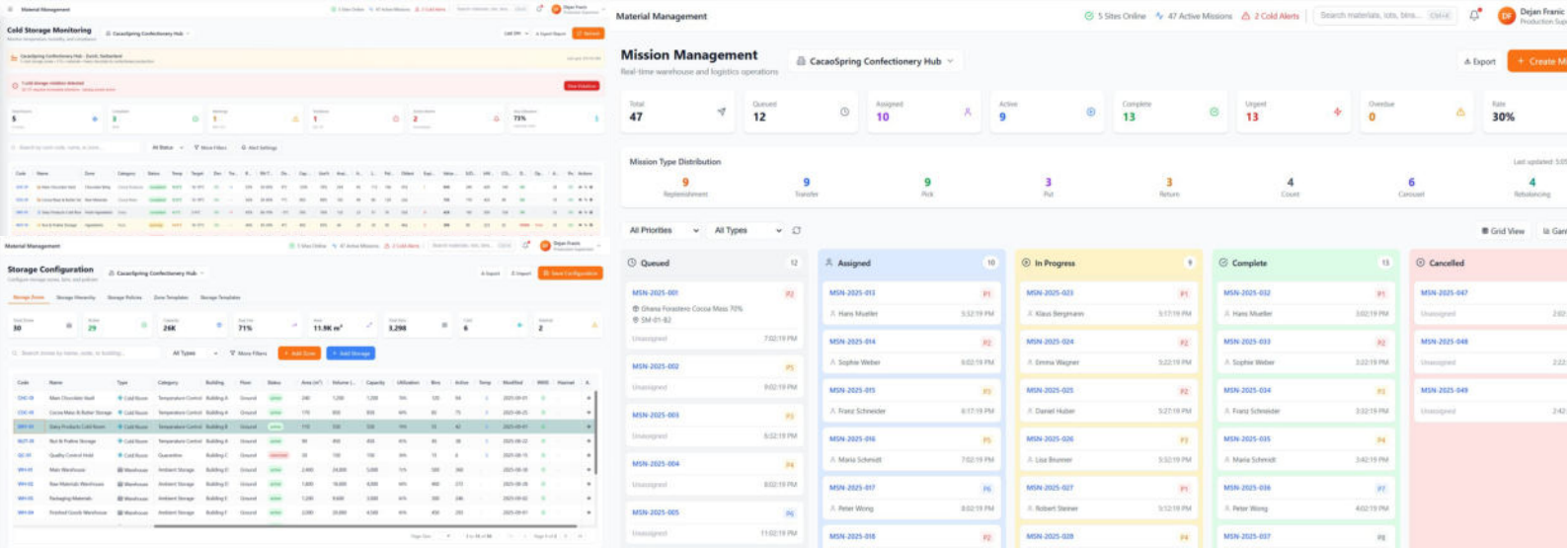
The LOGICAL SYSTEMS MM application acts as the execution hub for in-plant material flow, transforming replenishment and withdrawal policies into governed actions on the shop floor. Bins, Supermarkets, carousels, cold rooms, and line-side buffers are configured with min/max thresholds, FEFO/FIFO rules, and environmental limits, ensuring material is released only under compliant conditions. Missions are generated automatically from consumption pace, work orders, or policy triggers, and dispatched to operators or automation. This closed-loop execution ensures supply continuity without excess buffers or manual intervention, while supervisors maintain a single, real-time view of mission queues, supermarket health, and policy compliance.



Policy configuration aligns material flow with business rules while remaining flexible for high-mix and regulated environments. Consumption can be adjusted for potency, substitutions require justification and approval, and cannibalization rules govern pallet-to-case or unit breakdowns. Cold-room enforcement and SMT baking cycles are embedded at the point of issue, not left to after-the-fact reporting. Mobile and scanner-first workflows guarantee that operators follow the right sequence every time, with photos, signatures, and offline capability providing audit-ready assurance. Together, configuration and execution in MM deliver a governed, predictable, and responsive supply system that adapts to production dynamics while maintaining compliance.



At its core, MM applies Lean principles to material flow. Electronic kanban signals via Ignition tags ensure that replenishment is triggered by actual consumption pace, not static schedules, keeping inventory lean without risking stockouts. Supermarkets buffer materials with min/max thresholds, while carousels orchestrate precise pick/put sequences to minimize motion and errors. The mission board provides a single queue of replenishment, transfer, and return tasks prioritized by urgency and SLA so operators and automation execute only what is needed, when it is needed. This closed-loop, Just-in-Time (JIT) approach eliminates firefighting, reduces WIP buffers, and accelerates changeovers, delivering the stability and responsiveness required for demanding high-mix, regulated manufacturing.



Features

- Unique identification of materials and carriers with expiry, potency, hazards, and substitutions
- Configurable consumption and withdrawal policies (FIFO, FEFO, LIFO, LEFO, bin priority, environment gates)
- Mission board with priorities, SLAs, escalation workflows, and operator/automation assignments
- Pallet/container optimization with split, merge, and cannibalization rules under approvals
- Mobile/offline execution with barcode/QR/RFID scanning, photos, and e-signatures
- Multi-site support with centralized dashboards and reporting
- Seamless integration with ERP, WMS, WD, TMS, OEE, CMMS via LSA EAI
- Role-based access control with audit-ready logs
- Configurable replenishment and rebalancing logic (min/max, rate-based, demand-driven)

Benefits

- 99%+ inventory accuracy across sites and lines
- 20-30% higher workforce productivity through governed, mobile workflows
- 15-25% lower material waste from spoilage, overfills, and rework
- Faster changeovers and replenishment cycles, reducing downtime risk
- Fewer stockouts and line stoppages through electronic kanban and JIT missions
- Improved regulatory compliance via environmental governance and audit trails
- Enhanced operator confidence with scanner-first, guided workflows
- Optimized pallet/container utilization reduces storage and logistics costs
- Better schedule adherence with PVA tracking and substitution oversight
- Stronger cross-departmental coordination

Technical Requirements

System Requirements

Ignition® (8.1.+) Core Modules, Quad core processor, 16 GB RAM, 10 GB free disk space

Supported Operating Systems

Windows Server 2019/2022/2025, Windows 10/11, macOS (X, 10.16+), Linux (Ubuntu, CentOS, RHEL)

Supported Protocols

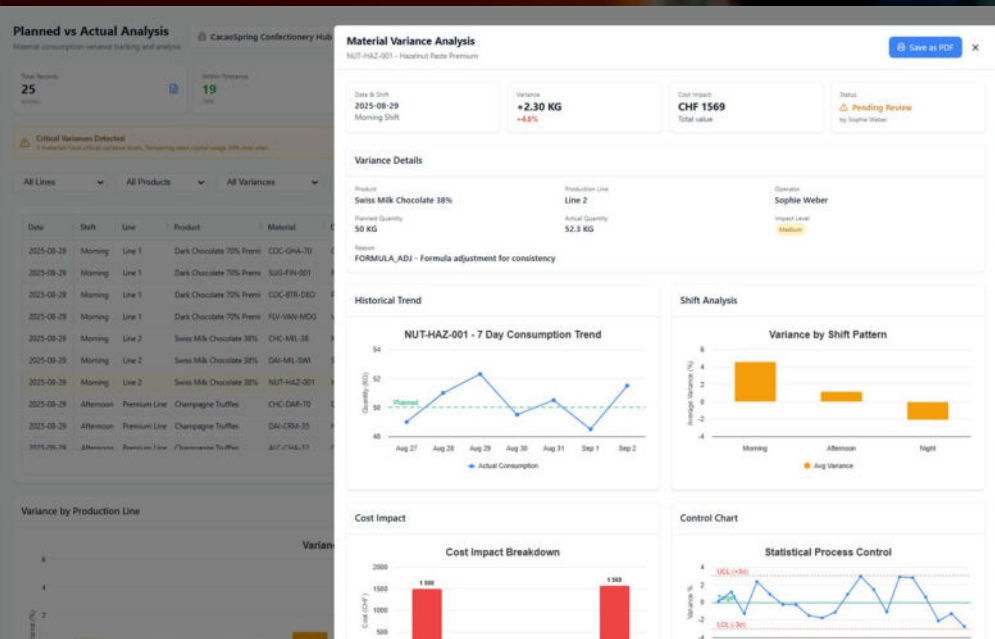
MQTT, OPC UA / OPC DA, REST API (JSON Payloads)
Kafka (via connector), Snowflake (via pipeline, data bridge)

Supported Databases

Microsoft SQL Server, Oracle, MySQL, MariaDB, PostgreSQL, any database with JDBC driver

Supported Browsers

Chrome, Firefox, Safari, Microsoft Edge



LOGICAL SYSTEMS MM

Right Material. Right Place. Right Time.

LOGICAL SYSTEMS MM App transforms material management from a source of uncertainty into a governed, predictable flow engine that delivers the continuity, compliance, and agility needed to achieve world-class manufacturing performance.

LOGICAL SYSTEMS
AUTOMATION & INTEGRATION SERVICES

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