



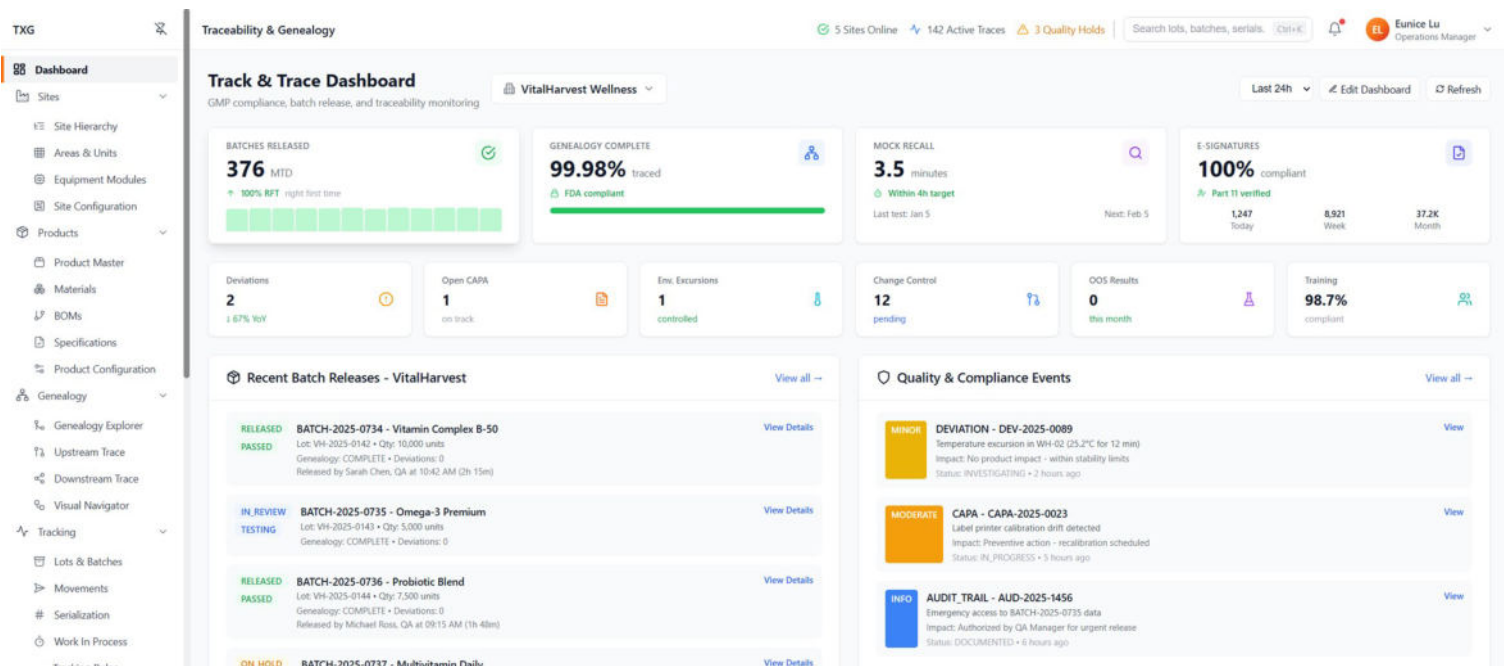
DATASHEET

Traceability & Genealogy

Complete Product Lineage and Compliance.

In most plants, the truth about product lifecycles are scattered across processes, machines, systems, and spreadsheets which makes recalls slow, investigations uncertain, and compliance a scramble. Whether captured manually or via automation, maintaining complete traceability is complex and error-prone.

LOGICAL SYSTEMS Traceability & Genealogy (TXG) application turns that fragmentation into a live, navigable lineage from raw materials to finished goods across both discrete and batch operations. It captures consumption, production, split/merge, pack/aggregate, movements, and reversals as they happen, normalizes them into an ISA-88/95 context across your manufacturing landscape, and builds an always-current genealogy you can traverse upstream for root cause or downstream for instant impact analysis. Purpose built for regulated environments, TXG maintains immutable audit trails and electronic signatures, supports serialization and aggregation with label generation, and produces audit-ready reports on demand.



The TXG app connects to your existing plant and business systems through open interfaces without requiring rip-and-replace, so you can start on one line and scale to multi-site deployments without losing control. With built-in controls auditors expect, the result is faster investigations, confident releases, and mock recalls in minutes, turning traceability from a compliance burden into an operational advantage.

From Transactions to Evidence

Trace forward, trace backward, prove everything.

The TXG app turns raw shop-floor and system events into a living genealogy aligned to ISA-88/95 thus normalizing quantities and UoMs, enforcing parent-child links (lot, sub-lot, serial), and preserving chain-of-custody with reversal-safe edits. A built-in Genealogy Explorer (tree/graph/Sankey) lets you traverse upstream for root cause and downstream for instant recall impact. Immutable audit trails, electronic signatures, serialization/aggregation and label jobs are baked in, not bolted on. Start on one line, prove mock recalls in minutes, then scale to multi-site implementations secured with role-based access by site or area and achieve clean, versioned lineage you can trust. As a fully configurable solution, TXG provides detailed modeling features at every process step.

The screenshot displays the TXG application interface, which is divided into three main sections: Bills of Materials, Product Specifications, and Genealogy Explorer.

Bills of Materials (BOM): This section shows the product formulations and component management for 'VitalHarvest Wellness'. It lists product BOMs (5) and details for 'Vitamin Complex B-50' (VH-VTB50-CAP + Rev 3). The BOM includes components like Omega-3 Premium, Probiotic Blend, and various vitamins (Thiamine, Riboflavin, Niacin) with their respective quantities and costs.

Product Specifications: This section shows the quality parameters and acceptance criteria for 'VitalHarvest Wellness'. It lists product specifications (5) and details for 'Vitamin Complex B-50' (VH-VTB50-CAP + Rev 4 + USP). The specifications include test parameters (12) and critical parameters (5) for identity, potency, and release.

Genealogy Explorer: This section shows the lineage of the product, allowing users to trace upstream for root cause and downstream for instant recall impact. It displays a tree view of the product lineage, including lot numbers, quantities, and dates.

Enabling Real-Time Lineage

The TXG App replaces spreadsheet stitching and ad-hoc queries with an always-on genealogy. Instead of rebuilding traces for every deviation, CAPA, or recall, teams configure materials and ISA-88/95 context once and TXG then captures events and maintains a verifiable chain of custody automatically.

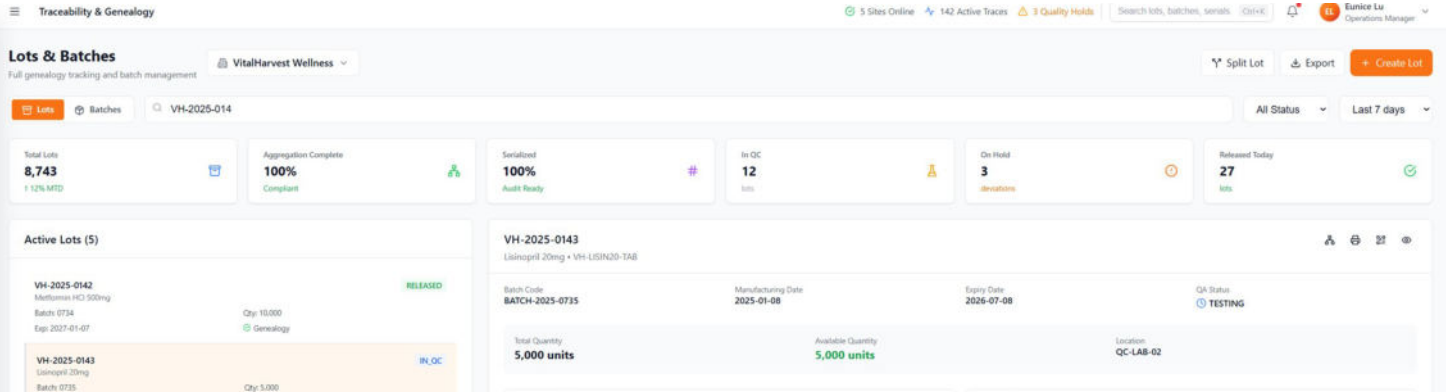
- Capture once, reuse for recalls, CAPA, audits
- Auto-build genealogy from consume/produce/split/merge/pack/transfer/reversal transactions
- Normalize lots, serials, quantities, and units in one model
- One-click upstream/downstream trace with impact analysis
- Reversals with immutable audit trail and e-signatures
- Serialization/aggregation and label payloads on demand



Run Genealogy as an Engine

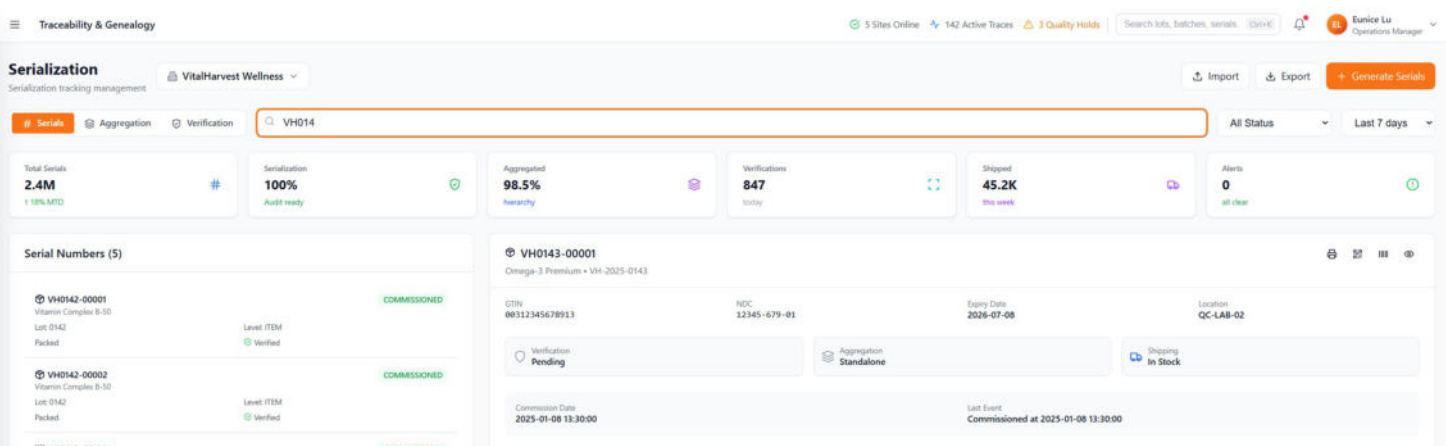
Standardization and Custody Verification

The LOGICAL SYSTEMS TXG app treats traceability as a managed system, not a pile of logs. You define tracking rules for consume, produce, split, merge, pack, transfer, and reverse events and the app binds them to your ISA-88/95 model and enforces quantity/UoM math, effective dates, and parent-child rules at ingest (tag-based or manual triggers). Chain-of-custody genealogy graphs are compiled in real-time, providing answers to queries with visualizations for “where-used,” “what-contains,” and “how impacted” analysis. Built-in coverage scoring, duplicate/orphan detection, data reconciliation, and safeguarded reversals keep the record correct the first time and every time.



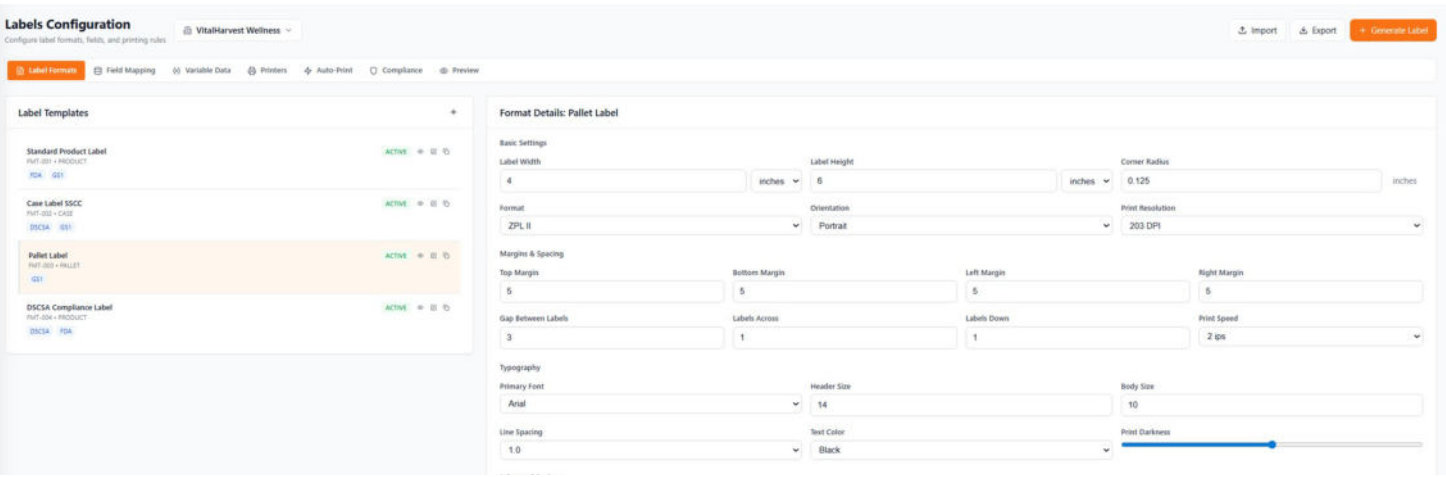
Rules Driven Tracking and Tracing

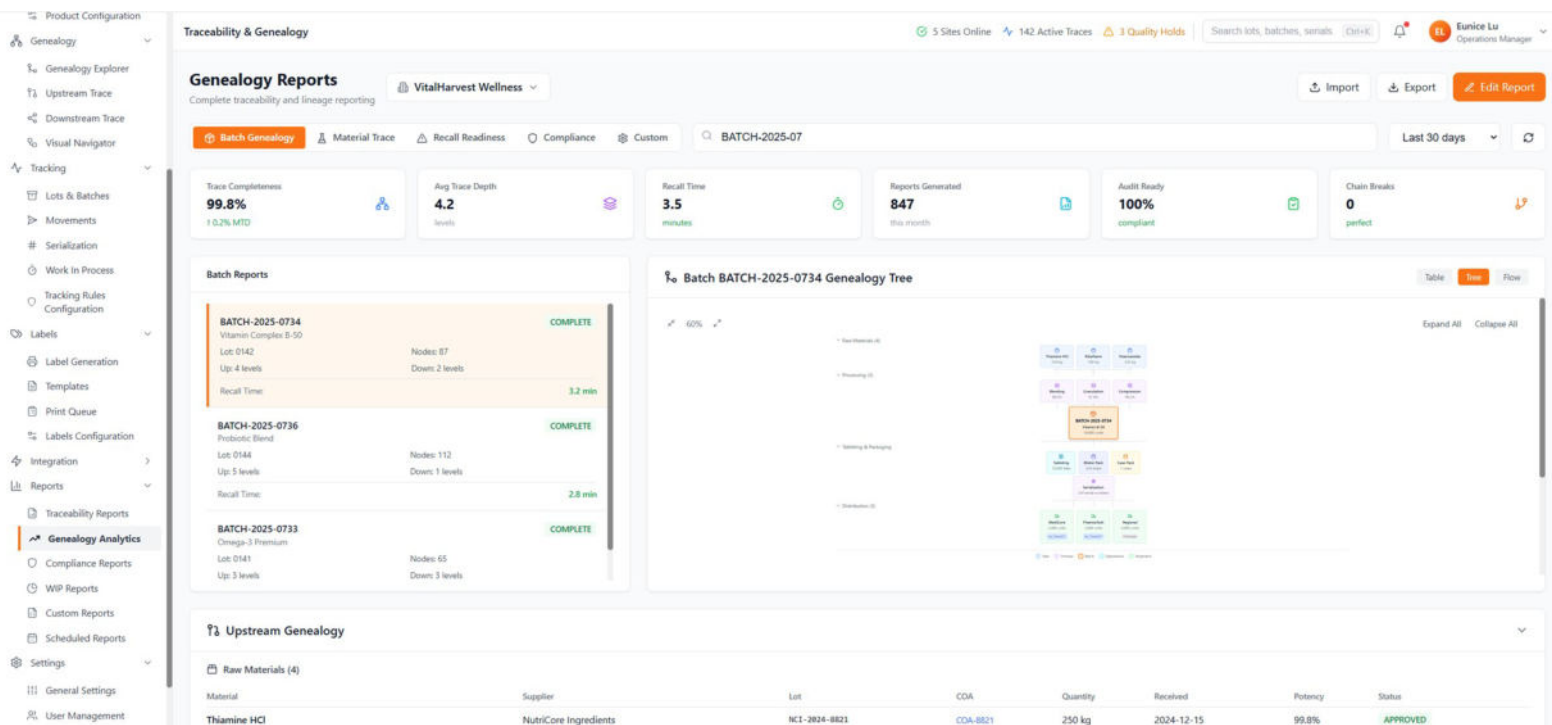
Operators work in fully configured live workspaces showing release flows and compliance KPIs with per-lot context such as batch code, production order, QA status, location, and a one-click View Tree for genealogy. Serialization is where item-case-pallet IDs are commissioned, aggregated, verified, and tracked to shipment, with full event history (aggregation, packaging) and verification counters validate against shipments so readiness is undeniable. Labels Configuration governs GS1/DSCSA templates, variables, printers, and auto-print rules (ZPL II and more), ensuring what leaves the door matches the lineage without after-the-fact reconstruction.



Connected Closed-Loop Control

TXG ingests shop-floor and system events and returns evidence-grade lineage to the tools that need it such as ERP/WMS for shipments and receipts, LIMS for results, MES/EBR for review, labelers for serialization and aggregation payloads. Open APIs and real-time updates power dashboards and mock recalls in minutes for holds, quarantines, and all movements propagate back to upstream systems to prevent escape. You start on one line and expand to multi-site with the same contracts, the same rules, and the same trustworthy record.





Key Features and Benefits

Features

- ISA-88/95 modeling for sites/areas/units with templates for discrete and batch processes.
- Transaction engine for consume, produce, split/merge, pack/aggregate, transfer, and reversal each with reason codes, timestamps, and e-signatures.
- Lots and batches workspace with release flow, QA status, temperature/humidity, location, and one-click View Tree genealogy.
- Genealogy Explorer (graph/tree/table/Sankey) with instant where-used / what-contains queries and depth controls.
- Mock Recall simulator with exportable customer/shipments list and impact analysis.
- Serialization: generate/commission item IDs, build case/pallet hierarchies, verify, and track event history to shipment.
- Labels Configuration: GS1/DSCSA-ready templates, variables, printer routing, auto-print rules, and ZPL II preview.
- Quality linkage: attach LIMS results and deviations to lots/serials; change control and quarantine/hold actions.
- Coverage and integrity scores: trace completeness, aggregation completeness, links verified, exception metrics.
- Collision detection and guidance for duplicate serials, orphan links, and quantity mismatches; reversal-safe edits.
- Open integrations: OPC UA/MQTT ingestion, REST APIs, and WebSocket updates for dashboards and EBR/WMS/ERP.
- Governance and security: RBAC by site/area, immutable audit log, record-retention policies, and Part 11 e-signatures.

Benefits

- 50-75% faster root-cause using upstream/downstream traversal and where-used queries.
- 100% compliance without the complexity: audit trails, e-signatures, GS1/DSCSA/UDI labels built-in.
- 20-30% lower rework and support costs by automating genealogy and serialization maintenance.
- Single source of truth for lineage, improving trust across QA, production, and supply chain.
- Higher release confidence via link verification, aggregation completeness, and exception visibility.
- Scales from one line to multi-site with consistent tracking rules, data contracts and process modeling templates.

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 TXG

Standardize and Orchestra Production Events with Verifiable Custody.

TXG provides complete product genealogy from raw materials through finished goods with visual, searchable, and audit-ready traceability. With interactive visualization, ISA-88/95 modeling, real-time OPC UA/MQTT capture, and native integration across the LSA suite including WIP, MM, EAI, OEE, WMS, LIMS, EBR, UNS. TXG transforms traceability from a compliance burden into an operational advantage. Whether facing recalls, investigations, or audits, TXG delivers instant answers with complete confidence.

LOGICAL SYSTEMS
AUTOMATION & INTEGRATION SERVICES

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