

LTTS Virtual Lights Out Factory



STATE OF THE MARKET

Manufacturers are accelerating toward autonomous, 24/7 “lights-out” operations to counter skill shortages, margin pressure, energy volatility, and increasingly complex product variants. Traditional automation alone cannot deliver the resilience required in this environment. The shift is toward physics-based digital twins, agentic AI, and predictive maintenance that close the loop from design to shopfloor. Leading organizations are moving beyond static automation to continuously optimize throughput, cost, energy efficiency, and quality in real time.

SERVICE OVERVIEW

LTTS builds a Virtual Lights-Out Factory powered by NVIDIA Omniverse (OpenUSD, RTX), enabling scalable, real-time digital twins of production lines and plant ecosystems. We integrate our proprietary frameworks—MECHA (Machine Health Intelligence) and AgeOps (Agentic Operations)—with deep cross-industry domain expertise to simulate “what-if” scenarios and enable closed-loop optimization. The result is predictive and prescriptive maintenance, reduced downtime and energy consumption, faster commissioning cycles, and end-to-end operational visibility across the manufacturing value chain.

KEY DIFFERENTIATORS



Design-for-Manufacturing First:

Physics-based simulation de-risks builds before hardware deployment, compressing validation cycles and reducing capital inefficiencies.



High-Fidelity Digital Twins:

OpenUSD-based, real-time plant models enable accurate “what-if” simulations, multi-user collaboration, and improved workflow integration.



Agentic AI on the Shopfloor:

AgeOps autonomously monitors robots, interprets logs and sensor data, diagnoses anomalies, and triggers preventive actions before failures occur.



Predictive Machine Health:

MECHA continuously tracks operational parameters to forecast failures and optimize maintenance scheduling.



XR-Enabled Workforce Readiness:

Immersive AR/VR training reduces time-to-competency and improves first-time-right performance in complex service environments.

BENEFITS

- 10–20% reduction in manufacturing cycle time through simulation-led synchronization and optimization.
- ~30% reduction in digital model footprint, enabling faster visualization and collaboration.
- Scalable OpenUSD-based digital manufacturing foundation built for enterprise-wide expansion.
- Unified engineering and operations data layer improving cross-functional decision velocity.
- Structured roadmap toward fully autonomous Lights-Out operations.



BUSINESS CASES

- **BIW Line:** Prevent robot weld gun failures and increase OEE with predictive monitoring.
- **EV Assembly:** Virtually commission new stations and reduce ramp-up defects.
- **Conveyor Networks:** Simulate buffers digitally to eliminate bottlenecks before hardware investment.
- **Test Benches:** Integrate CFD/FEA-linked digital twins to detect thermal drift early and prevent quality deviations.
- **Warehouse & Intralogistics:** Optimize picker routes and dock schedules using a logistics twin.
- **Field Service:** XR-guided procedures to shorten repair cycles and reduce repeat visits.