

A real-time, continuously synchronized virtual replica of operating tools using live telemetry, and predictive intelligence



cimetrixTM StudioTwin[®]

A True Virtual 3D Companion With Additional Intelligence

The **Cimetrix® StudioTwin** is a real-time operational twin that mirrors physical tools, simulating robot motion, wafer handling, scheduling, and chamber activity.

It enables teams to **optimize throughput**, **detect risks**, and **validate workflows** before deployment, without interrupting production.

Problem with **Status Quo**

- Limited visibility into internal operations
- Undetected collisions and logic errors until deployment
- Robot scheduling and idling visualization
- Predictive intelligence and throughput improvements are difficult when using physical mechanical constraints

Solution Highlights



Configurable 3D tool with **Virtual Reality** support

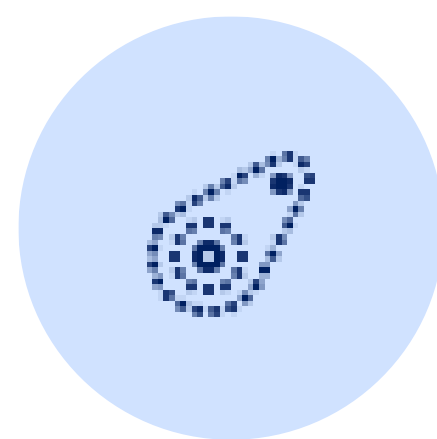


Sample applications and interface documentation



Available with CCF/ECF on **Windows and Linux** platforms

Key Components



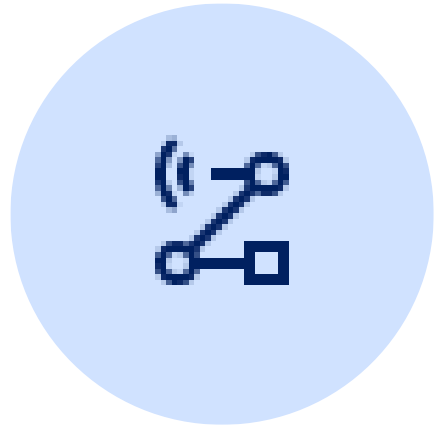
Digital Modeling Engine

Builds a high-fidelity digital twin using OEM CAD models of robots, chambers, aligners, valves, and load ports



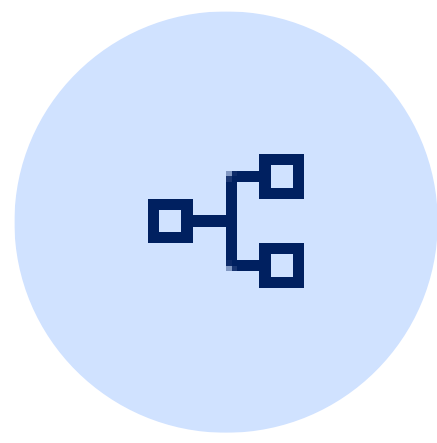
Physics and Motion Engine

Simulates accurate tool kinematics, including rotation, Z-motion, and extension/retraction of robotic components



Telemetry Synchronization

Streams real-time encoder data, sensor feedback, and optional instrumented wafer data into the digital twin



Decision Layer

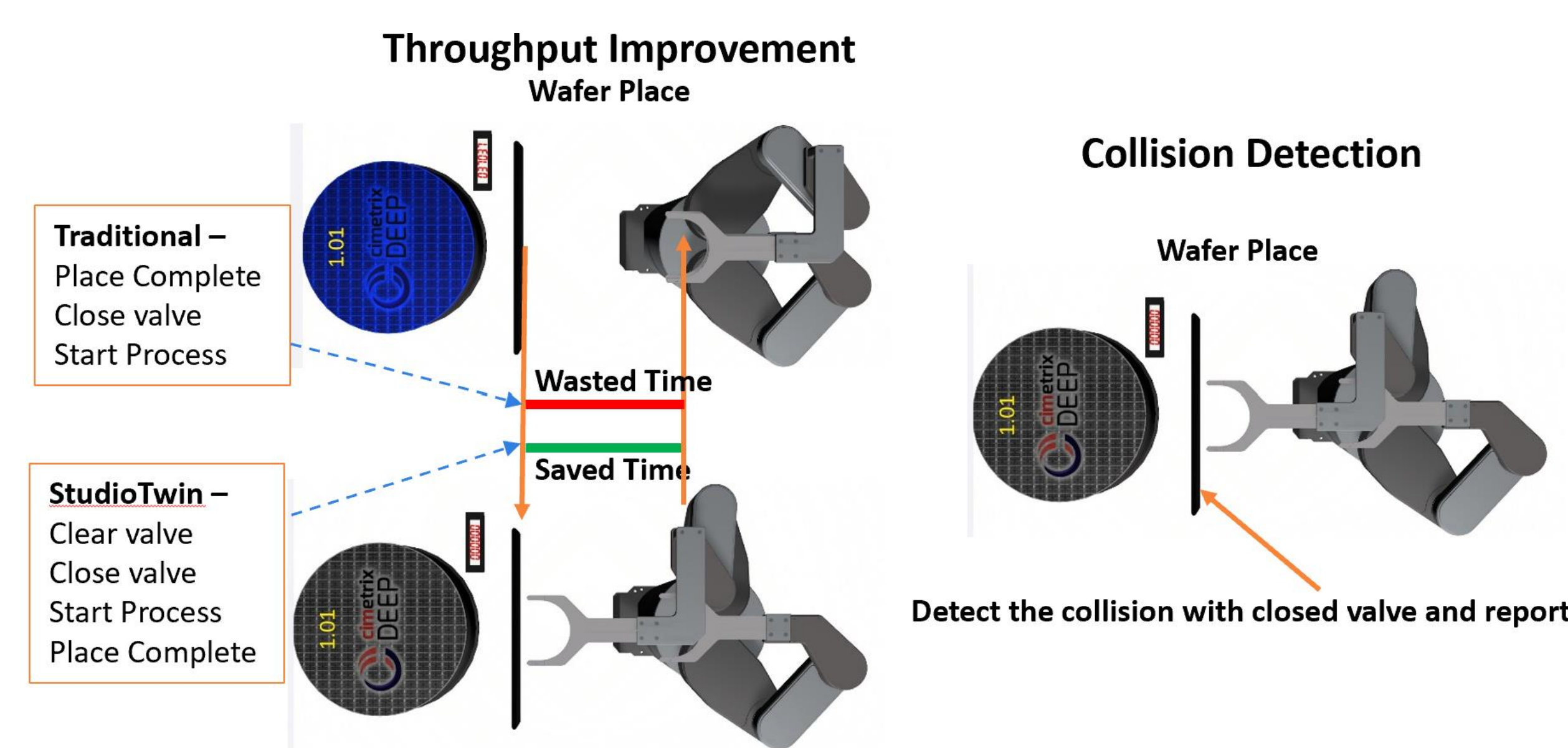
Determines when mechanical and process steps can safely execute based on modeled constraints and clearances



Use Cases

Process-Limited Throughput Improvement and Collision Detection

3D physics and real-time intelligence increase throughput by enabling Safe-to-Operate conditions during runtime. **Collision risks are identified early** during development.



Challenge

Conservative sequencing and limited visibility create idle time, reduce throughput, and increase collision risk



Result

Safe-to-operate intelligence enables earlier execution, improving throughput, reducing cycle time, and preventing collisions



Challenge

Logs lack context, making failure reproduction slow and dependent on tool access



Result

3D log playback visualizes tool behavior, accelerating root cause analysis and reducing downtime

Runtime Visualization, Failure Analysis and Continuous Optimization

Logs alone lack context. StudioTwin replays tool behavior in 3D, visualizing wafer movement and robot actions step-by-step to pinpoint failures.

Enables faster root cause analysis, remote troubleshooting, and improved response time.

Key StudioTwin Features

Operation Visualization

Throughput Gains

SafeToOperate Intelligence

Early Collision Detections

Live Motion Emulations

Seamless Scaling

Risk Reduction

XR-Extended Reality



Augmented – Virtual – Mix

- Vision Pro
- Microsoft HoloLens
- Meta Quest



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