Kognitwin® Simulation

Heavy asset insights with simulation models in digital twins

Simulation-driven operational excellence

Heavy-asset industries face critical challenges including downtime, inefficiencies, emissions, energy consumption, and training needs, impacting productivity and profitability.

Kognitwin Simulation addresses these challenges by leveraging Kognitwin's advanced digital twin technology to create high-fidelity 2D and 3D models of facility assets.

By offering unparalleled insight and control, these models empower operators to visualize, manage, and optimize real-time operations from anywhere. Furthermore, they leverage AI to streamline workflows and drive improvements.

Navigate complexity with high-fidelity simulation

Kognitwin Simulation empowers operators with a virtual representation of their assets, enabling them to simulate and analyse facility behaviour before implementing changes.

By integrating real-time data into digital models, operators gain a holistic view of operations, enabling them to identify inefficiencies, mitigate risks, and optimize performance.

Cloud-native access to advanced simulation engines like K-Spice® and LedaFlow® facilitates the modelling of dynamic production processes, multiphase flow, and control systems, ensuring continuous improvement and adaptation to evolving industry needs.

HIGHLIGHTS

One global environment
- One place for assets to get insights, plan, track, improve, and stay safe.

Fully contextualized IT & OT data
- Interoperable platform that ingests and contextualizes available data sources

Rich, data driven visualization
- Easily switch between 2D and 3D models with linked data for new features

Powered by advanced analytics and simulation
- The dynamic digital twin powered by 20 years of industry-leading simulation and modeling knowledge

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Key benefits

Real-time insights for better decision-making

Kognitwin Simulation provides dynamic, real-time simulations that reflect the current state of operations. This real-time visibility enables operators to identify potential issues, test scenarios, and implement optimisations quickly and effectively.

Scalable and flexible access

Cloud-native architecture ensures that users can access simulations from any device, anywhere. The container-based platform allows it to scale automatically to meet diverse operational demands. Additional computing power can be applied as needed, enabling faster simulations and more complex analyses.

Integrated workflows for greater efficiency

Operators can map data directly from P&IDs, manuals, and other relevant asset documents to create a unified digital twin environment. Workflows like isolation planning, operator rounds, and daily instructions are streamlined, improving efficiency and accuracy. Deviations identified during rounds are flagged in real-time, ensuring timely action.

Cost-effective simulation

Kognitwin Simulation gives you access to top-tier simulations that help your organisation reduce costs overall. Moreover, you only pay for the capability you use, which helps eliminate high upfront costs and ongoing maintenance expenses.

HIGHLIGHTS

Always-on and real-time plant insights
- Equipment statuses
- Overview graphics for easy navigation
- Virtual Sensors
- Multi-user access to AO simulation

Offline what-if simulations for expert engineers
- Download initial conditions from Kognitwin Simulation

Data connectivity and better data insights
- API for streaming of simulator data
- Contextualizing simulation parameters to datasheets in KTW
- Contextualizing between 3D, PnID and simulation
- User friendly download of simulation projects

Real-time Operational support
- Equipment performance monitoring
- Pre-configured look-ahead simulations
- Pipeline insights (holdups, hydrate risk, etc.)

Simulation Expert Services and Maintenance Support
- User controlled what-if simulations
- Remaining Useful Life estimations
- Custom flow assurance simulations

Dashboards and control panels
- Overview dashboards for simulators (KPIs)
- Simulation admin tool (project handling, access control)
- DCS graphics linked to simulation objects

Access precise predictions

The dynamic process simulator

K-Spice®

With K-Spice, engineers can verify process and control designs, simulate operational situations, and educate personnel in a safe, virtual space. The platform enables users to develop realistic models of oil and gas operations, incorporate real-time data streams, and investigate "what-if" and "look-ahead" scenarios to pinpoint the most effective strategies for intricate challenges.

Seamlessly integrating with the Kognitwin Simulation platform, K-Spice enables energy operators to elevate efficiency, bolster safety, and improve training outcomes. Part of the cloud-native Kognitwin solution, K-Spice provides users with instant access to robust simulation functionalities from any location, facilitating streamlined operations and more informed decisions.

Combining K-Spice capabilities with Kognitwin's robust digital twin ecosystem, organisations can ensure safer, greener, and more efficient operations while empowering personnel with the tools they need to succeed.
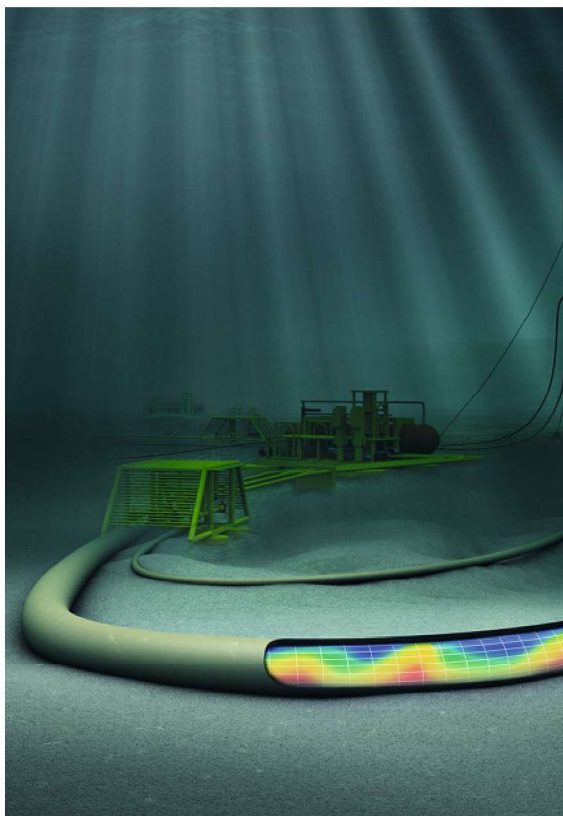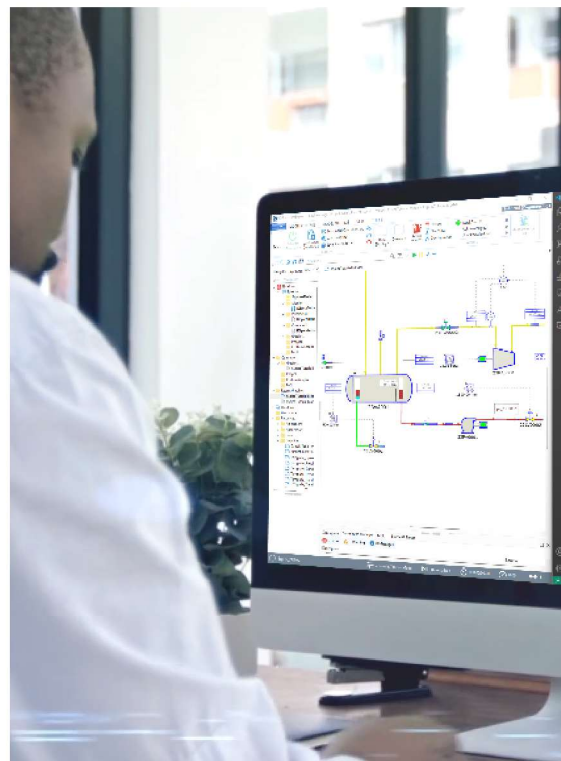
Advanced transient multiphase flow simulator

LedaFlow®

LedaFlow is a software solution optimising continuous flow assurance for oil, gas, CO_2, hydrogen, and steam, prioritizing safety, economic efficiency, and environmental sustainability.

Integrated with Kognitwin Simulation, LedaFlow transforms how operators monitor and manage production networks. Its ability to predict phenomena such as slug behaviour or hydrate risks enhances proactive decision-making, reduces downtime, and safeguards operations. By simulating complex flow behaviours in a dynamic, scalable digital twin ecosystem, users can optimise processes, lower emissions, and achieve cleaner, more sustainable energy production.

By uniting LedaFlow's advanced functionalities with Kognitwin's cloud-native, real-time platform, operators can achieve unprecedented accuracy and detail in simulating and optimizing complex flow systems from reservoirs to processing facilities. This powerful combination, LedaFlow powered by Kognitwin Simulation, provides energy companies with the means to operate more intelligently, address challenges effectively, and satisfy the industry's changing requirements.

Driving operational excellence with digital twins

Visualise and contextualise data

Kognitwin Simulation integrates real-time data, engineering documents, previous simulation results, and historical insights into a single environment. This ensures a comprehensive view of operations, enabling users to visualise equipment performance, analyse processes, and make data-driven decisions.

Test designs and "what-if" scenarios

The platform's near-infinite scalability allows operators to test various operational scenarios. Users can capture snapshots of current simulations to run "what-if" analyses, automatically triggering optimisation routines and sensitivity studies for actionable insights.

Reduce energy consumption and emissions

By testing adjustments virtually, engineers can enhance efficiency, reduce energy use, and minimise emissions. The ability to simulate these changes before implementation ensures sustainability goals are met without disrupting operations.

How Kognitwin Simulation works

Building high-quality models

Users can create discrete models of facility components, such as pumps or compressors, by importing relevant documents like manuals, data sheets, images, and P&IDs and then adding real-time data inputs. These models can be enhanced with performance curves and details to ensure accuracy and reliability.

Connecting smaller models into larger systems

Operators can create comprehensive simulations of entire facilities by linking individual component models. This interconnected system allows process engineers to optimise energy efficiency, automate processes, and gain otherwise unattainable insights.

Intuitive navigation and data access

The simulation interface mirrors real-world operations, providing intuitive navigation through 3D models, manuals, data sheets, P&IDs, and dashboards. Users can access all linked data and documents, ensuring that information is readily available for analysis and decision-making.

Advanced applications in energy operations

Real-time, AI-powered operational cockpits

Kognitwin Simulation provides advanced operational dashboards that offer an overview of critical alarms, ongoing tasks, and operational data. These AI-enabled cockpits enhance shift handovers, enable effective planning, and streamline issue resolution.

Improved maintenance workflows

The platform supports maintenance planning by allowing users to gather all necessary documents and data for specific tasks. This reduces preparation time and ensures that maintenance rounds are executed efficiently and effectively.

Intelligent systems integration

By integrating with APIs, Kognitwin Simulation connects real-time operational data with existing systems, providing a seamless flow of information across the value chain. This integration supports continuous improvement and long-term strategic planning.