



Simudyne Pulse

AI-Driven High-Frequency Market Simulation for Capital Markets

Simudyne Pulse is an advanced simulation platform designed specifically for stock exchanges and financial institutions navigating the complexities of high-frequency trading of cash equities, derivatives, futures, and options. Capable of millisecond—and faster—time resolutions, Pulse is engineered to simulate intricate market dynamics with unmatched precision. While optimised for intraday use, Pulse also extends its capabilities to simulate multi-day strategies, such as executing large orders over several days, up to a week.

Empowering Industry Leaders Like HKEX and LSEG

Simudyne Pulse is trusted by some of the most sophisticated financial institutions, including Hong Kong Exchanges and Clearing Limited (HKEX) and the London Stock Exchange Group (LSEG). [HKEX leverages the system to refine its liquidity risk management frameworks](#), developing optimal close-out strategies in real-time environments. Meanwhile, [LSEG's Turquoise platform uses Simudyne Pulse](#) to ensure regulatory compliance (e.g., MiFID II RTS 6) and to create a sandbox for algorithmic trading testing, enhancing governance and risk management capabilities for over 50 member institutions.

Built for High-Frequency Precision

Simudyne Pulse captures the millisecond-by-millisecond interactions that drive intraday price formation, liquidity dynamics, and order flow. Its AI technology creates a synthetic environment that mirrors real-world markets, enabling institutions to:

- Identify and mitigate slippage.
- Manage liquidity risk under high-frequency conditions.
- Test algorithmic strategies with unparalleled accuracy.

Innovative Calibration for Realism

Pulse's groundbreaking calibration methodologies include:

- Surrogate Models: Efficiently approximate simulation outputs to speed up calibration while retaining accuracy.
- Simulation-Based Inference: Use advanced GPU-based capabilities to directly estimate model parameters, enabling robust insights even for high-dimensional and complex simulations.

These methods ensure that Pulse simulators faithfully replicate essential market characteristics enabling users to make decisions grounded in realistic scenarios.

Synthetic Data for High-Frequency Applications

Pulse generates synthetic data that reflects real-world intraday market patterns, including volatility clustering, order flow correlation, and price dynamics. This data is instrumental for:

- Training AI models.
- Stress testing algorithms.
- Conducting regulatory compliance tests.

Key Use Cases

Intraday Liquidity Risk Management

Optimise execution strategies to minimise slippage and market impact. Institutions like HKEX use Pulse to enhance their risk management frameworks, ensuring robust liquidity strategies.

Regulatory Compliance and Governance

LSEG uses Pulse to comply with MiFID II RTS 6, providing a controlled environment for its Turquoise platform members to test trades without risking market stability.

Algorithmic Strategy Development

Test and refine high-frequency trading algorithms under realistic conditions to identify strategies that maximise returns while minimising risks.

Extended Order Execution

Simulate the execution of large orders over multiple days, optimising the balance between speed and market impact.

Stress Testing and Market Resilience

Prepare for market shocks by simulating extreme scenarios, ensuring strategies remain robust under volatile conditions.

Seamless Data Access through LSEG Collaboration

Through our collaboration with the London Stock Exchange Group (LSEG), customers can access Simudyne Pulse directly via LSEG's platform, benefiting from LSEG's Historical Tick Data. Accessed through LSEG's S3 Direct Service on AWS, this integration provides a frictionless pathway to data, eliminating the need for time-consuming data preparation. Whether it's equities, derivatives, options, or futures, users can start sophisticated modelling and analysis immediately, generating faster and more impactful insights.

A Catalyst for Strategic Innovation

Simudyne Pulse empowers traders to stay ahead of the curve in a rapidly evolving financial landscape. By enabling rigorous testing and strategy refinement, Pulse transforms theoretical models into actionable insights, ensuring institutions lead in high-frequency and intraday trading.

Discover the Power of Simudyne Pulse

Ready to elevate your approach to intraday market simulation? Contact us today to schedule a personalised demo and see how Simudyne Pulse can transform your institution's trading strategies.



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