SARNA TECHNOLOGIES

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Portfolio Margin Engine

We utilize the latest technical advancements including AI to respond to the growing needs of broker dealers, professional traders, clearing firms, and exchanges. Our team of industry veterans have deep experience developing and implementing complex solutions across the securities and derivatives industry. Firms can leverage Sarna's full suite or select specific offerings including Buying Power Engine (including Portfolio Margin), order and portfolio management systems (OMS/PMS), mobile and web user interface, security and authentication, back-office systems, database management, middleware and APIs, and infrastructure as code.

ADVANCED CAPABILITIES

FEATURE	DETAILS
OCC TIMS Methodology	Engine adheres to OCC TIMS methodology and utilizes standardized files and reports published by OCC for consistent risk-based margin calculations.
Custom House Policies	Can intake house-defined policies, including risk shocks, concentration, or other user-defined factors.
Open Orders Stress Tests	• Permutates through all potential post-trade scenarios • Support for portfolios with large number of open orders
Risk Shocks	Underlying Price, Implied Volatility, Parallel.
Value at Risk (VaR)	• Historical VaR with full revaluation • User-controlled number of scenarios and confidence level • Detailed output, including top contributors and P&Ls
Add-ons	• Implied Volatility up and down scenarios • Ability to accommodate custom add-ons
Pre-Trade & What-If	• Ability to pre-trade check multiple orders to an account in a single request, inclusive of multiple option orders in a basket • Allows user to pass custom leverage factors for BP calculations
Fractional Values	Can intake fractional quantities.
Continuous Audit Logs	• Complete snapshots of all values used for each calculation • Option to write logs on Blockchain (BaaS) for added tamper-proof auditing
Audit Playback	Ability to play back exact calculations.
Language Support	• Response messages by request locale (e.g., English vs. Spanish) • Warning and error levels of messages
OCC-Style Reports	Downloadable detailed CSVs following OCC standards.
Non-Marginable Assets	Can include non-marginable assets into Account Net Liquidity, such as: UITs, precious metals, rights, warrants, crypto, etc.
Cross Account Types	Individual, IRA, Portfolio Management, Inventory, Clearing, Dealer, Client, Correspondent, and more.
Subaccounts	Slicing account into portfolios with separate buying power.
Margin Admin UX	Optional web/mobile app to view and monitor accounts' risk.
OCC Calculator Import	Uploading OCC's Portfolio Margin Calculator (PMC) results CSV for advanced analysis.

BUSINESS IMPACT

FEATURE	DETAILS
Pre-Trade Check	• Validates if current Net Liquidity and BP level allow the trade • Includes proposed and live orders
Regulatory Compliance	Adheres to FINRA regulations and approved policies.
Intra-day Monitoring	• Detection of concentration and credit risk • Decrease of insolvency events

ARCHITECTURE

FEATURE	DETAILS
Black Box Architecture	• Can integrate with existing infrastructure (OMS/PMS, quotes) • If needed, can be delivered with Sarna's OMS or PMS
Cloud and On-Premise	Flexibility to deploy on the cloud, on-premise, or hybrid.
Infrastructure as Code	Simplifies cross-environment deployment and build automation.
Load Balancing	Communication layer powered by ZeroMQ providing scalable and distributed load balancing pattern leveraged by the engine.
Automation and Testing	Custom testing toolkit providing means for: self-integrity verification, monitoring, and troubleshooting.
API Ready	API-centered architecture without any dependencies other than input from the client.
Docker Container Ready	Can simplify deployment, management, and scalability.
Concurrent Processing	Designed to take advantage of all available CPUs/cores.
High-Performance Messaging	Utilizes ZeroMQ (in conjunction with Protobuf or MessagePack) for asynchronous communication and queuing layer.
Scalability	• Simple distribution across independent service instances • Auto-scaling through scripted infrastructure configuration

CONFIGURATION

FEATURE	DETAILS
BP Leverage Factor	Enables request to define leverage different from the default 6.7x.
Option Pricing Model	Per-request level override of Engine's default.
Concentration Alert Level	Per-request level override of Engine's default.
Default Scenarios	Supports the input of over 10 default scenarios.

Product Datasheet v4.1   Portfolio Margin Engine   www.sarna.io