SARNA TECHNOLOGIES

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Buying Power and 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, risk-decisioning, 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
Positions Pairing	• Custom pairing with buying power validation • Buying power updated at account and subaccount level in real time
Universal Spreads	Recently approved single and universal definition of a spread resulting in additional requirement improvement opportunity (CBOE Release No. 34-67752; File No. SR-CBOE-2012-043).
Open Orders	• Support for portfolios with large number of open orders • Debit vs. Credit, Open vs. Close awareness
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.
Block & Group Trades	Supports various allocation scenarios (pre-trade, post-trade, etc.)
Basket Trades	Inclusive of multiple option symbols
Suitability	Adherence to FINRA's suitability requirements for option trading levels and equity minimums on account level.
Fractional Values	Can intake fractional quantities and render proper pairings based on contract size, multipliers, and spread ratios.
Capital vs. Margin Requirements	Capital Requirements logic allows enabling Limited Margin or IRA accounts to trade all spread strategies.
Clearing House vs. BD Requirements	Can intake house custom requirements above the Reg T or statutory minimum (i.e., per symbol, account, correspondent, etc.)
Intra-day SMA BP	• Can use SMA to limit HSX BP, increasing margin call prevention • Covers typical HSX vs. SMA intra-day blind spot
Continuous Audit Logs	• Complete snapshots of all values used for each calculation • Option to write logs on Blockchain (BaaS) for added tamper-proof auditing • Downloadable records in CSV format and replay of JSON request/response pairs • View historical buying power and quotes exactly as seen by customers
Audit Playback	• Playing back exact calculations, including prices • Deterministic AI model allows re-run with exact results
Language Support	• Response messages by request locale (e.g., English vs. Spanish) • Warning and error levels of messages
Advanced Options	• Flex Options, 0DTE, fractional quantity • LEAPs: additional requirement to prevent "infinite money loop" • Adjusted multiplier/contract size, or extra lots with different underlying
Ratio Spreads	Mixed security types (option leg(s) covering stocks) or option-only (e.g., butterflies)
Spread Pairing Report	Report of composed spreads with sorted requirement
Pattern Day Trader Validation	Supports validation of configurable thresholds
Marginable LEAPs	Ability to include LEAPs into marginable equity with configurable requirement value
Multi Asset Types	• Stocks, Options, Bonds, Mutual Funds, and Crypto ready • Can include non-marginable assets into Account Net Liquidity • Advanced scenarios: short bonds, short against box, factors, etc.

FEATURE	DETAILS
Cross Account Types	Individual, IRA, Portfolio Management, Inventory, Clearing, Dealer, Client, Correspondent, and more
Subaccounts	• Dividing account into portfolios with separate buying power • Create, edit, and manage subaccounts within any account type • Buying power calculated for each subaccount
Portfolio Rebalancing	Can ensure that proposed rebalanced structure does not exceed allowed BP
Real-Time Buying Power	Optimized for BP recalculations in continuous fashion
Pairing Overrides	Client can pass specific spread pairings for calculations
Position Transfers	Move positions between subaccounts in real time with buying power checks
Cash Transfers	• Instantly move cash between subaccounts • Buying power updated in real time
Custom Shocks	Advanced global shocks and custom risk profile capability

BUSINESS IMPACT

FEATURE	DETAILS
Match Underlying Clearing System	Configurable to match underlying clearing system formulas (Beta, Phase3, etc.) for intra-day coverage and pre-trade checks, reducing the risk of overnight margin calls and insolvency.
AI Risk Shield	Safeguard accounts from potential losses in AI-enhanced trading
Margin Excess	• Increased margin ability & buying power for clients via option pairing logic adhering to modern regulations • Direct impact on revenue from margin interests
Pre-Trade Check	• Validates if current BP allows the trade • Includes proposed and live orders
Intra-day Monitoring	• Detection of excessive securities exposure • Decrease of liquidation and insolvency events • Dynamic adjustments of requirements per-symbol
Regulatory Compliance	• Adheres to Reg T, FINRA Maintenance, overnight, and intra-day requirements • Maximum requirement improvement allowed by regulators
Rules Validation	• Pattern Day Trader equity level and margin utilization • Margin Account equity level
Moment-to-Moment Net Capital	• Allows continuous monitoring of sufficient net capital • Net capital check prior to purchasing or selling proprietary securities • Compliance with SEA Rule 15c3-1

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
Automation and Testing	Custom testing toolkit for self-integrity verification, monitoring, and troubleshooting
API Ready	API-centered architecture without any dependencies other than input from the client
GPU Ready	Utilizes top-of-the-line library to process critical computations via CUDA-based GPUs
Docker Container Ready	Can simplify deployment, management, and scalability

PERFORMANCE

FEATURE	DETAILS
Optimized AI Model	• Dramatic improvement of NP-complete class complexity problem • Allows rapid pairing of inputs and seeks optimal risk result inclusive of edge scenarios
Concurrent Processing	Designed to take advantage of all available CPUs/cores
High-Performance Messaging	Utilizes ZeroMQ (with Protobuf or MessagePack) for asynchronous communication
Performance Benchmarks	• Capable of processing typical 10-20 lots request below 1ms* • Real-world strategy processing averages 10ms-50ms depending on complexity • Provides reliable backbone for corrections, adjustments, or re-runs ** Detailed analysis available upon request*
Scalability	• Simple distribution across independent service instances • Auto-scaling through scripted infrastructure configuration
GPU Calculations	Optional performance enhancement for AI models

CONFIGURABILITY

FEATURE	DETAILS
Per-Client Configuration	• Client has ability to configure an instance of the Engine • Additional ability to alter certain configurations on request level
Allowed Strategies	Controls strategies allowed per Account Type (Cash, Limited Margin, Margin) and Trading Level
Initial Minimum Equity	Controls minimum initial equity per Account Type and Strategy
Day Trader	• Controls minimum initial equity per Strategy • High watermark alerts
Default Special Margin Requirements	Controls default values for all calculators and requirement rules
Strategy Requirement Calculators	Each strategy can have risk calculation formula customized as desired by the client
Execution Parallelism	Controls how the engine uses server CPUs/GPUs for execution
Pricing Values	• Customer decides exact values used for pairing process and market value calculations • Client can utilize native Bid/Ask/Last, Limit price, synthetic Mid-Points, etc.
Marginable LEAPs	Configurable per instance or per request
Warnings/Errors	• Ability to add/remove custom warnings and errors • Customizable language
Input Lots Aggregation	Multiple methods to choose from to fit the need
Robust Filters	Date/time, account groups, and custom intervals
Alerts	Set thresholds and alerts for UI and email notification
Overrides	Symbol-specific and max credit overrides