

DECIMUS CAPITAL MARKETS, LLC



Modern HFT

**HFT Market Making Strategies, Regulation NMS
& Exchange Order-Matching Engine Practices**

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Module 1: HFT Market Making Strategies

The module reviews the HFT scalping algorithmic trading tradition in detail. Properties are discussed that have remained relatively stable pre and post REG NMS.

- HFT prior to rebate scalping
- The “0+ Scalping Strategy”
- Top-of-queue strategies
- Queue utility
- Self-insurance
- Sweep risk
- Key microstructure conditions
- Flow discrimination & toxic flow identifiers
- Low latency as a barriers to entry
- Why “fast and dumb” strategies continue to work
- Fragmentation of microstructure alpha across venues
- Market structure arbitrage
- Economics of HFT scalping strategies
- Observable phenomena associated with HFT scalping
- HFT scalping and the rapid withdrawal of liquidity
- HFT scalping and false liquidity
- HFT scalping and mini-flash crashes
- HFT scalping and “spam & cancel strategies”
- HFT scalping and baiting techniques

Module 2: Regulatory Arbitrage

This module provides overview of REG NMS and how this body of regulation was subverted by firms engaging in new forms of “regulatory arbitrage”

- REG-NMS
- Order Protection Rule
- Access Rule
- Sub-Penny Rule
- Market Data Rules and Plans
- Trade-through rules
- Locked markets
- Introduction to REG NMS price sliding
- Impact of the SIP feed
- Constructed NBBO feeds
- Disparity between market centers
- Latency arbitrage
- REG-NMS and Intermarket Sweep Orders
- Limit order protection
- Best execution rules
- Relevant pricefeed features



Module 3: HFT Order Types

This module provides a detailed explanation of order types that have artificially advantaged HFT scalping strategies.

- Traditional order types
- Hidden orders and REG-NMS
- Non-routable orders
- Introduction to advantaged order types
- Intermarket Sweep Orders (ISOs)
- “Adding Only” orders
- DAY ALO ISOs
- Orders that “hide and light”
- “Hide and light” – exchange comparison
- REG NMS price sliding revisited
- Common advantaged API features
- Midpoint order types
- Important order modifiers
- Additional special order type variants
- Relation to price feed features

Module 4: Order Matching Engine Practices

This module provides a review of key features of exchange order matching engines leveraged by HFTs.

- Exchange API channels
- Spamming and canceling
- Rejects and unsolicited cancels
- Reposting strategies
- Price time priority
- Precedence of order types
- Self-trade prevention
- The dark side of REG NMS price-sliding
- Various forms of price-sliding
- Hidden vs. “lit” states revisited
- “Display” and “working” prices
- Conditions for “lighting”
- Rebooking and display times
- Price-time priority corruption
- Maker-taker allocation
- Exchange nuances handling locked markets
- Assessing price-sliding utility
- Comparison between electronic exchanges
- Impact on price feed features



Module 5: Predatory HFT

This module provides a review of exchange order matching practices that are heavily exploited by predatory HFT strategies

- Classes of predatory HFT
- Latency arbitrage revisited
- Collocation preferencing
- Quote layering, stuffing, spoofing?
- Order matching engine abuse
- How HFTs exploit order precedence
- How HFTs exploit price sliding
- How HFTs exploit maker/taker fee allocation
- How HFTs exploit locked markets
- How HFTs exploit trade-through protections
- Exchange-specific practices
- Price feed artifacts utilized by HFTs
- Additional predatory practices

Module 6: Electronic Liquidity Strategy

This module covers a number of defensive and offensive measures firms can take to effectively extract liquidity from HFTs.

- Recognizing matching engine abuse
- Measuring slippage attributable to HFT
- Adverse fill detection
- Correlating exchange latencies
- Usage of liquidity codes
- Usage of confirms, cancels and naks
- Usage of price-sliding feedback
- Defending against latency arbitrage
- Defending against market structure arbitrage
- Measures to avoid being used for self-insurance
- Measures to exploit adverse impact of sweeps
- Measures to defend against queue jumping
- Selective usage of self-insurance methods
- Managing intermarket contamination
- Options for sponsored access risk checks
- Rationalizing HFT concepts with traditional buy side algorithmic trading strategies
- Migrating to signal-based execution strategies

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