



MARKET PROTECTIONS

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PROPRIETARY INFORMATION OF MIAMI INTERNATIONAL SECURITIES EXCHANGE, LLC

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MIAX OPTIONS EXCHANGE – NATIONAL OPERATIONS CENTER

Reliability That You Want...



...Confidence That You Need

PROPRIETARY INFORMATION OF MIAMI INTERNATIONAL SECURITIES EXCHANGE, LLC



MIAX OPTIONS EXCHANGE – NATIONAL OPERATIONS CENTER

- **National Operations Center (“NOC”), Located in the Princeton, NJ office**
 - Centralized Systems Control, Monitoring & Management
 - Leverages on-site expertise, facilitates system operation, & expedites troubleshooting
 - Help Desk and Systems Operations teams occupy the same space to facilitate communication & speed of troubleshooting responses
 - Business & systems domain experts immediately accessible to provide key decision making
 - Software development & systems technology staff available to provide deep technical knowledge & experience when needed
 - Centralized Management of Exchange System Startup & Initialization
 - Centrally managed & controlled
 - Manages operational dependencies through entire startup & initialization process
 - Automatically alerts key stakeholders of failures
 - Exchange systems startup and initialization can be overridden in the event of any failure



MIAX OPTIONS EXCHANGE MARKET PROTECTIONS – FOR ORDERS

	Protection	Description	Available Currently	Configuration Details
1.	Max Open Orders	The MIAX System tracks the aggregate number of Simple Market open orders and separately tracks the aggregate number of Complex Market open orders resting on its book for each Firm. Firms may define a maximum number of open orders threshold for the Simple Market and a maximum number of open orders threshold for the Complex Market, or use the Exchange default values. Once the either the Simple Market or Complex Market Max Open Orders threshold has been reached, MIAX rejects all new orders for that market but allows orders submitted prior to the threshold breach to continue to be managed and trade. The Max Open Orders functionality provides the protection of speed bumps without entirely removing the Member from the market. To resume submitting orders in the affected market, the Member must contact MIAX Trading Operations.	Yes	Member configurable Exchange Defaults: 30,000 Simple Market orders 30,000 Complex Market orders
2.	Max Open Contracts	The MIAX System tracks the aggregate total quantity of Simple Market unexecuted contracts and separately tracks the aggregate number of Complex Market open unexecuted contracts resulting from open orders resting on its book for each Firm. Firms may define a maximum number of open contracts threshold for the Simple Market and a maximum number of open contracts threshold for the Complex Market, or use the Exchange default values. Once the either the Simple Market or Complex Market Max Open Contracts threshold has been reached or exceeded, MIAX rejects all new orders from the Firm for that market. To resume submitting orders in the affected market, the Member must contact MIAX Trading Operations.	Yes	Member configurable Exchange Defaults: 1,000,000 Simple Market open contracts 1,000,000 Complex Market open contracts



MIAX OPTIONS EXCHANGE MARKET PROTECTIONS – FOR ORDERS

	Protection	Description	Available Currently	Configuration Details
3.	Max Order Size	MIAX compares the quantity on each incoming order to a pre-defined Maximum Order Size. Firms may define a Maximum Order Size for orders in the Simple Market, orders in the Complex Market and for PRIME orders, or use the Exchange default values for these protections. In addition to the foregoing Exchange-wide settings, Firms may now select Firm/Class Maximum Order Size protections that will apply specifically to a selected Class. If an order exceeds the Maximum Order Size protection, MIAX rejects the order. Maximum Order Size is a per order protection and applies to all order types.	Yes	Member configurable Exchange Defaults: 10,000 contracts
4.	Real-Time High Order Rates	The MIAX System monitors each Firm's order rates in real-time to watch for atypical behavior. If the System detects a Firm's order rate is higher than normal, it sends an alert to Trading Operations. MIAX Trading Operations may contact the Member to confirm whether the higher order rate is intended. The Real-Time High Order Rate Monitoring functionality provides the protection of a speed bump without removing the Member from the market.	Yes	N/A
5.	Risk Protection Mechanism ("RPM"): Order Rate Protection	MIAX provides Members the ability to manage the operational risk associated with order rates. MIAX's Risk Protection Mechanism gives Members the flexibility to create multiple groups, made up of a single or multiple Market Participant Identifier ("MPIDs"), and define order rate thresholds specific to each group's risk tolerance. Order rates can be measured for varying durations, ranging from 1 second through the entire trading session. Members may assign multiple order rates to each group allowing them to detect micro bursts of activity or activity that the Member considers risky when monitored over time. Members must establish at least one Allowable Order Rate setting, with a corresponding specified time period of not less than one second, and not to exceed ten seconds. The maximum time period for this protection will be established by the Exchange and communicated to Members via Regulatory Circular. The System generates warnings to a Member when a group reaches both 70% and 90% of its threshold. Once a threshold is exceeded, the System rejects new orders and, if configured by the Member's request, cancels all open day orders submitted by all MPIDs in the group. For a group to resume trading, the Member must contact MIAX Trading Operations.	Yes	Member configurable Exchange Default: N/A Member Default a minimum of one protection is required



MIAX OPTIONS EXCHANGE MARKET PROTECTIONS – FOR ORDERS

	Protection	Description	Available Currently	Configuration Details
6.	Risk Protection Mechanism (“RPM”): Executed Contract Rate Protection	MIAX provides Members the ability to manage the operational risk associated with contracts executed from orders. MIAX’s Risk Protection Mechanism gives Members the flexibility to create multiple groups, made up of a single or multiple MPIDs, and define the maximum number of executed contracts allowed for each group within a Firm-defined time period. Executed contract rates can be measured for varying durations, ranging from 1 second through the entire trading session. Members may assign multiple executed contract rates to each group allowing them to monitor for microbursts of activity or activity that a Member considers risky when monitored over time. Members must establish at least one Contract Execution Rate setting, with a corresponding specified time period of not less than one second, and not to exceed ten seconds. The maximum time period for this protection will be established by the Exchange and communicated to Members via Regulatory Circular. The System generates warnings to a Member when a group reaches both 70% and 90% of its threshold. Once an execution occurs which causes the total number of executed contracts within the defined time frame to exceed the Executed Contract Rate Protection threshold, the System rejects all subsequent new orders, and if configured by the Member’s request, cancels all day orders submitted by the group. For a group to resume trading, the Member must contact MIAX Trading Operations.	Yes	Member configurable Exchange Default: N/A Member Default: a minimum of one protection is required
7.	Firm Initiated Order Mass Cancel	Firms can initiate a systematic mass cancel of their orders via FIX. Orders to be cancelled can be specified by MPID, TIF, and/or Class. Cancellations submitted via FIX affect only orders transmitted over that FIX session.	Yes	N/A
8.	Firm Requested Manual Mass or Limited Cancel	Firms can initiate a manual mass cancel of their orders via a request to Trading Operations. Orders to be cancelled can be specified by Firm, MPID, TIF, and/or Class. Manual cancellations executed by Trading Operations affect orders across all FIX sessions.	Yes	N/A



MIAX OPTIONS EXCHANGE MARKET PROTECTIONS – FOR ORDERS

	Protection	Description	Available Currently	Configuration Details
9.	Firm Initiated Manual Order (and Quote) Block and Cancel	MIAX Manual Block and Cancel allows Members to request that all quotes and orders, by firm name or MPID, be cancelled and all new inbound quotes and orders blocked. A Member may request Exchange staff to (i) remove and cancel all of its orders (and quotes) in the System and (ii) block all new inbound orders (and quotes), by firm name or by MPID. The block will remain in effect until the Member requests Exchange staff to remove the block.	Yes	N/A
10.	Auto Cancel on Disconnect (“ACOD”)	The MIAX Auto Cancel on Disconnect Order Protection allows Firms to elect an automated cancellation function for eligible orders upon loss of connectivity to the Exchange. In the event that a loss of connectivity occurs, the System will close the Member’s session and cancel all eligible orders as instructed by the Member. Following a disconnect, reconnection will not be permitted for a certain period of time as disseminated via Regulatory Circular.	Yes	Yes <i>(see MIAX FIX Interface Functional Specification)</i>
11.	No Bid - Offer Threshold	If the Exchange, upon initial receipt or reevaluation, evaluates a market order to sell an option when the national best bid is zero and the national best offer is greater than \$0.10, the System will cancel the market order to sell. If the National Best Offer is equal to or less than \$0.10 at the time of evaluation, the System will convert the sell market order to a sell limit order with a price of one Minimum Price Variation (“MPV”) and post the order on the book.	Yes	Exchange Setting: \$0.10
12.	Max Liquidity Price Check for Orders	Maximum Order Price field check. The system will reject a new order with a price that exceeds the Maximum Liquidity Price.	Yes	Exchange Setting: \$1,999.99 <i>(see MIAX FIX Functional Specification)</i>
13.	Limit Order Opposite Price Percent and Value	MIAX rejects limit orders priced through the opposite side of the NBBO by an amount greater than either 50% or \$2.50, whichever is lesser. This protection will not be activated for limit orders to sell when the NBBO on the bid side is less than \$0.25.	Yes	Exchange Setting: the lesser of \$2.50 or 50%



MIAX OPTIONS EXCHANGE MARKET PROTECTIONS – FOR ORDERS

	Protection	Description	Available Currently	Configuration Details
14.	Wide Market Threshold	MIAX rejects market orders, regardless of side, if the NBBO spread is greater than or equal to the Exchange wide market threshold.	Yes	Exchange Setting: \$5.00 <i>(or class maximum quote width, if greater than \$5)</i>
15.	Minimum Price Variation	MIAX rejects limit orders with an invalid MPV.	Yes	N/A
16.	Opening Price Collar: Expanded Quote Range (“EQR”)	MIAX’s Expanded Quote Range provides a price protection collar for orders during the opening and during re-openings following a market halt. Any orders that participate in MIAX’s opening process will only execute at prices at or within the collar. MIAX determines the EQR by evaluating its book’s two-sided quotes that meet MIAX’s valid-width requirements. As an additional precaution, MIAX also considers the best away valid-width market when determining the EQR to provide our members with away-market price protection. MIAX subtracts a predefined offset from the best bid and adds a predefined offset to the best offer to define the EQR. MIAX predefines the offsets conservatively to establish tight collars that further mitigate the risk of orders executing at erroneous prices. The System executes orders at prices at or within the EQR, routing to any away markets at the NBBO, or at prices outside the NBBO but at or within the collar and cancels any unexecuted balance of orders priced through the opening price.	Yes	Please see the Appendix for the predefined offset grid
17.	One-Tick Intraday Price Collar	MIAX limits how far an order can “walk the book” through the NBBO at the time of initial evaluation. For market orders, or limit orders priced through the market, in the absence of a specified multi-tick value, the System does not execute more than one MPV away from the original opposite side NBBO. The System cancels any remaining unexecuted order balance priced through the collar back to the client.	Yes	Exchange Default: 1 tick



MIAX OPTIONS EXCHANGE MARKET PROTECTIONS – FOR ORDERS

	Protection	Description	Available Currently	Configuration Details
18.	Multi-Tick Intraday Price Collar	Similar to the Exchange default of one tick, MIAX's multi-tick price collar limits how far outside the NBBO at the time of initial evaluation an order can “walk the book”. For each order, Members instruct how many ticks from the original opposite side NBBO the order can trade. Members can select a multi-tick value within the allowable range. When specified, the Member provided multi-tick value replaces the Exchange default one-tick value for that order. The Order will not be displayed or executed outside the less aggressive of its limit price or its protected price and will be cancelled by the System if its protection limit would be exceeded.	Yes	Member configurable order-by-order: 0 to 20
19.	MIAX Price Collars (“MPC”) for Complex Orders	MIAX Price Collars is an Exchange-wide system for Complex Orders that will prevent them from executing at potentially erroneous prices by establishing a price range based pre-set dollar amount that will be added to (for buy orders), or subtracted from (for sell orders), the opposite side cNBBO at the time of evaluation. The Complex Order will not be displayed or executed outside the less aggressive of its limit price or its MPC protected price and will be cancelled by the System if its MPC protection limit would be exceeded.	Yes	Exchange Setting: \$0.25
20.	NBBO Managed Orders	When MIAX is not at the NBBO, the System manages Non-Routable orders so they do not lock or cross the NBBO. The System displays the order one MPV away from the current opposite side NBBO. The System books the order at an internal price locking the away market. As the NBBO updates, the System dynamically re-prices the order and continues to display it one MPV away from the new NBBO, until the order is posted at its original limit price, is fully executed, or cancelled.	Yes	N/A
21.	Duplicate Order ID Check	Order validation check for duplicate order ID’s. If MIAX receives an order with a duplicate order ID, MIAX rejects the order.	Yes	N/A
22.	Time Stamp Validation	MIAX checks the time stamp on incoming orders for stale or queued orders. If MIAX receives the order more than sixty seconds from the order’s original time stamp, MIAX rejects the order.	Yes	Exchange Setting: 60 seconds



MIAX OPTIONS EXCHANGE MARKET PROTECTIONS – FOR QUOTES

	Protection	Description	Available Currently	Configuration Details
1.	ARM	<p>The MIAX Aggregate Risk Manager (“ARM”) tracks the number of contracts traded by a Market Maker, represented as a percentage of quote size, in an assigned option class within a specified time period. ARM is in effect at the opening and throughout the trading day. The Market Maker establishes a percentage of their quotation size (Allowable Engagement Percentage) and the time period for each option class. In the absence of a Market Maker established percentage and time period, Exchange defaults will apply. When an execution against a Market Maker’s Standard quote occurs, the System looks back over the specified time period to determine whether the executed contract quantity equals or exceeds the Allowable Engagement Percentage. If triggered, ARM automatically:</p> <ul style="list-style-type: none"> • Purges all of the Market Maker standard quotes from the class • Blocks new quotes until an ARM re-entry is sent via MIAX Express Interface (“MEI”) • Allows eQuotes to continue to be sent while ARM is in effect <p>Members may choose one of two Reset on Quote (“RoQ”) settings:</p> <ul style="list-style-type: none"> • Reset on Quote (the default behavior), will reset the executed contract count on the bid (or ask) side of any option where the Firm has submitted a revised bid (or ask) quote • Do NOT Reset on Quote will NOT reset the executed contract count on the bid (or ask) side of any option where the Firm has submitted a revised bid (or ask) quote, and will include ALL CONTRACTS EXECUTED within the specified ARM time period. • To change the default behavior from Reset on Quote to Do NOT Reset on Quote, or back to Reset on Quote, contact MIAX Trading Operations 	Yes	<p>Member configurable by class</p> <p>Exchange Default: 105% over 1 second</p> <p>Minimum Allowable Engagement Percentage: 1 %</p>
2.	ARM Re-entry	<p>MIAX eliminates potential “race conditions” by restricting the Market Maker from entering new quotes until the Market Maker acknowledges receipt of the ARM by sending a re-entry request and is knowingly submitting new quotes in the affected class.</p>	Yes	Required



MIAX OPTIONS EXCHANGE MARKET PROTECTIONS – FOR QUOTES

	Protection	Description	Available Currently	Configuration Details
3.	ARM ² – Multiple ARM triggers in a Class	<p>Extending the concept of ARM, MIAX System will monitor the following to automatically trigger ARM²:</p> <p>When a Firm defined number of ARMs for a given Option class are triggered over a Firm defined period of time, the System will purge all quotes for the Firm for that class. Re-engagement of quote acceptance will be done manually by the Exchange once permission is given by the Firm to MIAX Trading Operations.</p>	Yes	Member configurable
4.	ARM ² – ARM triggers in Multiple Classes	<p>Extending the concept of ARM, MIAX system will monitor the following to automatically trigger ARM²:</p> <p>When a Firm has experienced a defined number of unique options classes have triggered ARM within a Firm defined period of time, the System will purge all the quotes Exchange-wide across all the quoting interfaces for a given Firm. Re-engagement of quote acceptance will be done manually by the Exchange once permission is given by the Firm to MIAX Trading Operations.</p> <p>This functionality acts as an Exchange wide quote mass cancel in all classes that the Firm trades in versus a class only quote mass cancel.</p>	Yes	Member configurable
5.	Firm Initiated Mass Quote Cancel	<p>MIAX Members may submit quote mass cancellations through MEI to remove all of their quotes and/or cancel all or a subset of their quotes in the System, by MPID or MPID/class combination. The Firm Initiated Mass Quote Cancel:</p> <ul style="list-style-type: none"> • Cancels all of the Market Maker Standard quotes and eQuotes from the class • Blocks all new inbound Standard quotes until a re-entry is sent via MEI • Blocks all new inbound eQuotes until a re-entry is sent via MEI 	Yes	N/A



MIAX OPTIONS EXCHANGE MARKET PROTECTIONS – FOR QUOTES

	Protection	Description	Available Currently	Configuration Details
6.	Firm Initiated Hybrid Mass Quote Cancel	<p>Using the Hybrid Mass Quote Cancel, MIAX Members may submit mass quote cancellations through MEI to remove all of their Standard quotes while leaving eQuotes unaffected. Firms may cancel their Standard quotes in the System by MPID/class combination.</p> <p>The Firm Initiated Hybrid Mass Quote Cancel:</p> <ul style="list-style-type: none"> • Cancels all of the Market Maker Standard quotes from the class • Blocks all new inbound Standard quotes until a re-entry is sent via MEI • Does not cancel or block eQuotes 	8/3/2017	N/A
7.	Firm Initiated Manual Quote Mass Cancel	MIAX Manual quote mass cancellation allows Members to request that all quotes in the System be cancelled. A Member may request Exchange Staff to remove all of its quotes and/or cancel all or a subset of its quotes in the System, by firm name or by MPID.	Yes	N/A
8.	Firm Initiated Manual Quote (and Order) Block and Cancel	MIAX Manual Block and Cancel allows Members to request that all quotes (and orders), by firm name or MPID, be cancelled and all new inbound quotes (and orders) blocked. A Member may request Exchange staff to (i) remove all of its quotations (and cancel all of its orders) in the System and (ii) block all new inbound quotations (and orders), by firm name or by MPID. The block will remain in effect until the Member requests Exchange staff to remove the block.	Yes	N/A
9.	Real Time Monitoring of Quote Rates	The MIAX System monitors each Firm's quote rates in real-time to watch for atypical quoting behavior per MEI session (quoting interface) as well as for the entire Firm. If the System detects that a Member's quote rate is higher or lower than normal, it sends an alert to Trading Operations. MIAX Trading Operations may contact the Member to confirm whether the observed behavior is intended. The Real-Time High Quote Rate Monitoring safety provides the protection of a speed bump without removing the Member from the market.	Yes	N/A



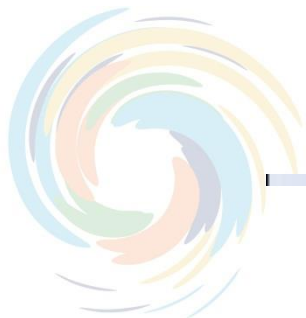
MIAX OPTIONS EXCHANGE MARKET PROTECTIONS – FOR QUOTES

	Protection	Description	Available Currently	Configuration Details
10.	Automatic Quote Purges	MIAX Automatic Quote Purge Protection allows Members to specify that in the event of a loss of connectivity for a given MEI port, the Member's quotes and eQuotes may be cancelled. In any case, if connectivity with the Firm's last MEI port is lost during a defined period of time disseminated via Regulatory Circular, the System will close the session and automatically cancel all quotes and eQuotes.	Yes	Yes <i>(see MIAX MEI Functional Specification)</i>
11.	Opening Price Collar: Expanded Quote Range ("EQR")	MIAX creates a collar during the opening process to protect the Members from executing at erroneous prices. The collar prevents the execution of trades on the open outside the price collar. Orders may be routed to any away markets both at the NBBO, and/or to markets priced outside the NBBO but at or within the collar. To define the collar, MIAX considers all two-sided quotes that meet its minimum width requirements and the best away markets. MIAX takes the best bids and offers from away markets and MIAX quotes and subtracts a predefined offset from the bid and adds a predefined offset to the offer to calculate the collar. Any quotes that participate in MIAX's opening process will only execute at prices at or within the collar.	Yes	Please see the Appendix for the predefined offset grid
12.	NBBO Managed Quotes	When MIAX is not at the NBBO, the System manages Market Maker quotes so they do not lock or cross the NBBO. The System displays the quote one MPV away from the current opposite side NBBO and books the quote at a price that will internally lock the current opposite side NBBO. As the NBBO fades, the System dynamically re-prices the Market Maker quote and continues to display it one MPV away from the new NBBO, until the Market Maker quote reaches its original limit price, is fully executed or cancelled.	Yes	N/A
13.	Max Liquidity Price Check for Quotes	Maximum Quote Price field check. The system will reject a new standard quote or eQuote with a price that exceeds the Maximum Liquidity Price.	Yes	Exchange Setting: \$1,999.99 <i>(see MIAX MEI Functional Specification)</i>



MIAX OPTIONS EXCHANGE MARKET PROTECTIONS – FOR QUOTES

	Protection	Description	Available Currently	Configuration Details
14.	MIAX Price Collars (“MPC”) for Complex eQuotes	MIAX Price Collars is an Exchange-wide system for Complex eQuotes that will prevent them from executing at potentially erroneous prices by establishing a price range based pre-set dollar amount that will be added to (for buy orders), or subtracted from (for sell orders), the opposite side cNBBO at the time of evaluation. The Complex eQuote will not be executed outside the less aggressive of its limit price or its MPC protected price and will be cancelled by the System if its MPC protection limit would be exceeded.	Yes	Exchange Setting: \$0.25



APPENDIX

EXPANDED QUOTE RANGE (“EQR”)		
Option Classes Not Included in the Penny Pilot – EQR Nickel-Dime Issues		
Bid Range	EQR	>9 Months
\$0.00 - \$1.00	\$0.05	5x
\$1.01 - \$3.00	\$0.10	5x
\$3.01 - \$5.00	\$0.20	5x
\$5.01 - \$10.00	\$0.30	5x
\$10.01 - \$20.00	\$0.50	5x
\$20.01 - \$40.00	\$0.70	5x
>\$40.00	\$0.90	5x
Option Classes Included in the Penny Pilot – EQR for Penny-Nickel Issues		
Bid Range	EQR	>9 Months
\$0.00 - \$1.00	\$0.05	5x
\$1.01 - \$3.00	\$0.10	5x
\$3.01 - \$5.00	\$0.20	5x
\$5.01 - \$10.00	\$0.30	5x
\$10.01 - \$20.00	\$0.50	5x
\$20.01 - \$40.00	\$0.70	5x
>\$40.00	\$0.90	5x
Options Overlying SPY/ IWM / QQQ EQR for All Penny Issues		
Bid Range	EQR	>9 Months
\$0.00 - \$0.40	\$0.05	5x
\$0.41 - \$1.00	\$0.07	5x
\$1.01 - \$2.00	\$0.10	5x
\$2.01 - \$3.00	\$0.15	5x
\$3.01 - \$5.00	\$0.20	5x
\$5.01 - \$10.00	\$0.30	5x
\$10.01 - \$20.00	\$0.50	5x
\$20.01 - \$40.00	\$0.70	5x
>\$40.00	\$0.90	5x