



MIAx Pearl Equities Exchange

User Manual

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1. Introduction

MIAX Pearl Equities (the Exchange) created this User's Manual to assist Members and users of its Exchange in understanding the operation of the Exchange. The User's Manual discusses, and in some cases, summarizes various MIAX Pearl Equities Rules. MIAX Pearl Equities complete and official Rulebook is available at <https://www.miaxequities.com/rulebook/MIAXPearl>. In the event of a conflict between the User's Manual and the Rules set forth in the official Rulebook, the Rulebook shall prevail.

MIAX Pearl Equities will operate a fully automated electronic equities trading platform for the purpose of buying and selling securities with a continuous, automated matching function. The Exchange is a Price/Display/Time allocation model with a Maker/Taker fee structure.

MIAX Pearl Equities supports both a binary and FIX order entry interface, with parity in functionality supported on both. Liquidity is derived from orders to buy and sell. Orders are submitted to the Exchange electronically by Members. MIAX Pearl Equities does not maintain a physical trading floor. There are two categories of Members on MIAX Pearl Equities – Equities Market Makers, and all other Members who are known as Order Entry Firms (OEFs).

Rates for executions and services on the Exchange will be set forth in the Exchange's Fee Schedule. The complete MIAX Pearl Equities Fee Schedule will be available on the Exchange's website under the Fee Summary.

2. Hours of Operation

Normal Trading Hours

Pre-Opening System Availability (Order Entry Only)	7:30 am to 9:30 am Eastern Time
Regular Hours Trading	9:30 am to 4:00 pm Eastern Time

Holiday Schedule and Altered Trading Hours

The Holiday Schedule and any deviations from the Normal Trading Hours listed above will be found on the Exchange's website.

3. How to Become a Member of MIAX Pearl Equities

Only Equity Members may transact business on MIAX Pearl Equities via the System. An Equity Member must be an existing Member or become a Member of the MIAX Pearl, LLC. Equity Members may trade Equity Securities for their own proprietary accounts or, if authorized to do so under applicable law and SEC rules and regulations, may conduct business on behalf of customers.

Every Equity Member shall at all times maintain membership in another registered exchange that is not registered solely under Section 6(g) of the Exchange Act or in FINRA. Order Entry Firms that transact business with customers must at all times be members of FINRA.

As part of the on-boarding process, each member will be required to provide a list of NSCC MPIDs that can be used for order entry. Members are allowed to use one or more of these MPIDs to send orders via their sessions. Each session may be permissioned for one or more MPIDs.

Non-members of MIAX Pearl Equities will be able to access MIAX Pearl Equities by setting up a Sponsored Access agreement with a MIAX Pearl Equities Member.

Further information on membership at MIAX Pearl Equities is available on the Exchange's website:
<https://miaxequities.com/membership/pearl-equities>.

4. Types of Membership

There will be two basic types of Equity Member: Order Entry Firms (“OEF”) and Equities Market Makers.

Equities Market Makers

To become an Equities Market Maker, an Equities Member is required to register by filing a registration request with the Exchange pursuant to Exchange Rule 2605. Registration as an Equities Market Maker will become effective on the day the registration request is submitted to the Exchange.

Equities Market Makers will have to, on a daily basis, maintain a two-sided market on a continuous basis during regular market hours for each equity security in which it is registered as an Equities Market Maker (“Two-Sided Obligation”). For each equity security in which they are registered, an Equities Market Maker must adhere to the pricing obligations set forth under Exchange Rule 2606(a)(2) during Regular Trading Hours.

The individual Market Participant Identifier (“MPID”) assigned to an Equity Member to meet its Two-Sided Obligation shall be referred to as the Equity Member’s “Primary MPID”. Equities Market Makers may request the use of additional MPIDs that shall be referred to as “Supplemental MPIDs.”

Order Entry Firms (OEFs)

OEFs are MIAx Pearl Equities Members representing orders as agent on MIAx Pearl Equities and those non-Equity Market Maker Members conducting proprietary trading.

5. Access by Non-Members

Non-Members may access the Exchange pursuant to Rules governing “sponsored access” to the Exchange. The Exchange permits access by entities (Sponsored Users) whose access is authorized in advance by entering into an arrangement with a Member (Sponsoring Member) in accordance with Exchange Rules.

Sponsored Users must agree to comply with all applicable Rules of the Exchange governing the entry, execution, reporting, clearing and settling of orders in securities eligible for trading on the Exchange.

- A Sponsored User is a person or entity that has entered into a sponsorship arrangement with a Sponsoring Member for purposes of receiving access to the System.
- A Sponsored User may obtain and maintain authorized access to the System, only if such access is authorized in advance by one or more Sponsoring Members.
- The Sponsored User must enter into and maintain a customer agreement(s) with its Sponsoring Member(s), establishing a proper relationship(s) and account(s) through which the Sponsored User will be permitted to trade on the System.
- The Sponsored User and its Sponsoring Member must have entered into and maintained a Sponsored User Agreement with the Exchange.
- To the extent the Sponsoring Member is not a clearing firm, the Sponsoring Member’s clearing firm, which must be a Member, must provide the Exchange with a Letter of Authorization, which specifically accepts responsibility for the clearance of the Sponsored User’s transactions. An existing Letter of Authorization may be amended to include the Sponsoring Member/Sponsored User relationship. Sponsored User Agreements and Letters of Authorization are filed with the Exchange.

6. Systems Architecture, Interfaces and Connectivity

Architecture

MIAX Pearl Equities trading architecture is highly scalable and consists of multiple Matching Engines. The Exchange supports a software and hardware architecture that results in minimizing the demands on power, space and cooling while allowing for rapid scalability, standard setting resiliency and superior fault isolation.

Each Matching Engine handles trading for a set of security symbols. The symbol sets may not be contiguous ranges of symbols and could be organized in any manner as assigned by the exchange. For the most part, the symbol assignments will be static in terms of allocation to a Matching Engine. However, if reallocation of symbols across various Matching Engines is needed, such changes would be communicated to the firms with ample notice prior to the actual implementation.

In addition to state-of-the-art monitoring and systems security, the MIAX Pearl Equities System uses a next-generation highly-automated Quality Assurance platform that runs a full battery of tests against the System every night to ensure a high level of reliability and unprecedented confidence in System updates.

Order Entry Interfaces

Equities Market Makers and OEFs can use two interfaces for the transmission of orders and other messages to and from the Exchange:

1. The FIX Order Interface (FOI), or
2. The MIAX Express Orders Interface (MEO), a proprietary binary protocol.

- **FIX Order Interface (FOI)**

Equities Market Makers and OEFs may connect to the Exchange via the FIX Order Interface (FOI) gateway using the industry standard FIX protocol with MIAX Pearl Equities specific extensions for the transmission of orders and other messages to and from the Exchange.

FOI validates incoming orders and forwards them to the appropriate Matching Engine. Executions and cancellation notifications are provided through each FOI interface.

For additional details about FOI, please see the FOI Interface Specification on the MIAX Pearl Equities website: <https://www.miaxequities.com/interface-specifications/MIAXPearl-equities>.

- **MIAX Express Orders Interface (MEO)**

MEO is a gateway interface that provides clients order entry capabilities to all MIAX Pearl Equities Matching Engines. MEO will route an order to the appropriate Matching Engine based on the security.

Member firms have flexibility in setting up MEO ports to cater to their architecture.

- Each MEO interface can have one Full Service port and one Priority Purge port.
- Port Types:
 - **Full Service Port (FSP).** Supports all MEO order input message types.
 - **Priority Purge Port (PPP).** Supports Mass Cancel Requests only
 - If a Firm has multiple MEO interfaces, Mass Cancel requests can be sent on Priority Purge ports of any of these interfaces.

Firms will be assigned backup MEO ports on backup infrastructure. These are slated to be used in the event of failure of primary MEO infrastructure. These backup MEO ports will not accept any messages while operating in the backup mode and are solely used for connection verification while in this mode. Note that these backup ports will have separate IP addresses than the primary ports.

For additional details about MEO, please see the MEO Interface Specification on the MIAX Pearl Equities website: <https://www.miaxequities.com/interface-specifications/MIAXPearl-equities>.

Drop Copy

The MIAX Pearl Equities FIX Drop (FXD) is a messaging interface that provides real-time order activities of firms' MEO as well as FOI orders. It offers two types of FIX Drop Ports:

1. Standard FIX Drop
2. FIX Order by Order

Neither port type accepts orders.

FXD supports entitlement by:

1. MPIDs
2. FIX order entry ports/sessions
3. Binary order entry ports/sessions
4. Firm Type
 - **Clearing Firm.** One or more MPIDs of member firms that clear through the Clearing firm; one or more order entry sessions of member firms that clear through the Clearing firm.
 - **Member Firm.** One or more MPIDs of the firm; one or more order entry sessions of the firm.

- **Standard Fix Drop**

Standard FIX Drop ports only send trade information and include Execution Reports and Trade Cancel/Correct messages.

- **Fix Order by Order Drop**

FIX Order by Order Drop ports send all order activities other than rejects, including all Execution Reports and Trade Cancel/Correct messages.

For additional details about FXD, please see the FOI Interface Specification on the MIAX Pearl Equities website: <https://www.miaxequities.com/interface-specifications/MIAXPearl-equities>.

Proprietary Direct Feeds

- **Top of Market (ToM)**

MIAX Pearl Equities Top of Market (ToM) is a data feed that allows subscribers to receive real-time updates of the following information from the MIAX Pearl Equities Exchange:

- MIAX Pearl Equities Best Bid and Offer (MPBBO)
 - Best Bid and Offer price with aggregated displayed size
- MIAX Pearl Equities Last Sale (trades)
- Trade Cancellations
- Trading Status of symbols traded on MIAX Pearl Equities
- MIAX Pearl Equities System Status

ToM real time data feed is disseminated across 24 feed channels, one per Exchange Matching Engine. Recipients can subscribe to two identical feeds ("ToM A" and "ToM B") per feed channel for the purpose of redundancy.

For additional details about ToM, please see the ToM Interface Specification on the MIAX Pearl Equities website: <https://www.miaxequities.com/interface-specifications/MIAXPearl-equities>.

Additionally, bandwidth recommendations for ToM can be found in MIAX Connectivity Guide on the MIAX Pearl Equities website: <https://www.miaxequities.com/connectivity?gid=equities>.

- **Depth of Market (DoM)**

MIAX Pearl Equities Depth of Market Feed (DoM) is a data feed that allows subscribers to receive real-time updates of the following information from the MIAX Pearl Equities Exchange.

- Displayed orders on MIAX Pearl Equities book: Display Price and Display Size of displayed orders are disseminated
- Order executions (trades) and Trade Cancellations
- Trading Status of symbols traded on MIAX Pearl Equities
- MIAX Pearl Equities System Status

DoM is available to all MIAX Pearl Equities participants.

When an order is modified, the modify order message will carry a flag to indicate whether the order kept its position on the orderbook or not.

DoM real time data feed is disseminated across 24 feed channels, one per Exchange Matching Engine. Recipients can subscribe to two identical feeds ("DoM A" and "DoM B") per feed channel for the purpose of redundancy.

For additional details about DoM, please see the DoM Interface Specification on the MIAX Pearl Equities website: <https://www.miaxequities.com/interface-specifications/MIAXPearl-equities>.

Additionally, bandwidth recommendations for DoM can be found in MIAX Connectivity Guide on the MIAX Pearl Equities website: <https://www.miaxequities.com/connectivity?gid=equities>.

Network Infrastructure

The MIAX Pearl Equities network was designed to complement the MIAX Pearl Equities Trading System and was built from the ground up to address the performance and security needs of a high speed trading platform. The MIAX Pearl Equities network infrastructure utilizes fully diverse and redundant 40Gbps backbones and 10/40Gbps switch technology for maximum throughput and minimal latency.

Data Center Services

MIAX Pearl Equities has partnered with Equinix, a world-class provider of data center services, to host the Trading System's data center infrastructure in its NY4 location.

Customers with very low latency demands can cross-connect to the MIAX Pearl Equities System from elsewhere within the Equinix NY4 facility. All MIAX Pearl Equities cross-connects in NY4 are latency equalized to ensure each participant's cross-connect is the same physical distance from the MIAX Pearl Equities System regardless of their location in the Equinix facility in NY4.

Notable Data Center Services

- SSAE16 compliant Data Centers
- Redundant power feed sourced from district substations
- Redundant power and cooling distribution paths within the facility
- Concurrently maintainable (N+1 for greater resiliency)
- On-site backup power generation

Enhanced Security Services

- State of the art security
- Hand Scanners
- Card Readers
- Cameras
- Buildings designed to withstand fires, earthquakes, hurricanes and other environmental threats
- Manned 24/7

A second data center is located in Chicago (CH4) for Disaster Recovery.

Connectivity Choices

MIAX Pearl Equities offers truly diverse, redundant 10 Gigabit ULL connectivity options in data center facilities and supports direct attachment of customer/provider network equipment or direct attached host systems. The 1 Gigabit ULL connectivity option is available for order entry purposes, but MIAX Pearl Equities market data will not be available on 1 Gigabit cross connects. Users are strongly encouraged to establish a minimum of dual cross connects to the primary facility in NY4 and connection to the disaster recovery system located in Chicago (CH4) to minimize the possibility of service disruption. Certain Members of MIAX Pearl Equities will have mandatory participation requirements in the Exchange's annual Disaster Recovery (DR) test and will therefore be required to establish a connection to the disaster recovery system located in Chicago (CH4). MIAX Pearl Equities supports the following connectivity options:

- **Cross-Connect.** Users that are located in the Equinix NY4 data center can connect to MIAX Pearl Equities via latency equalized cross-connect. Users that are located in other New Jersey Secaucus Equinix IBX campus locations (NY2/NY5/NY6) can connect via Equinix IBX inter campus cross connects.
- **Point-to-point.** Users may connect point-to-point using leased lines or via third-party providers.
- **Metro Ethernet/Dark Fiber.** Users may connect via Metro Ethernet or a dark fiber provider.

Historical Data

Historical Data is a data product that offers historical Equity market data for orders entered into the System upon request. To request Historical Data, please contact MIAX Pearl Equities Trading Operations at:

TradingOperations@MIAxEquities.com.

Information and Performance Reports

MIAX Pearl Equities Information and Performance Reports provide Member Firms with details of their trading and activities on the Exchange. Reports include key information about transaction fees, the NBBO and MPBBO at the time of transaction, as well as volume, clearing and risk protection thresholds. This information is intended to assist firms in monitoring and evaluating their trading activity on MIAX Pearl Equities.

Further information on the availability of MIAX Pearl Equities Information and Performance Reports can be obtained by contacting MIAX Pearl Equities Trading Operations at: TradingOperations@MIAxEquities.com.

7. Available Order Types and Instructions

PBBO and NBBO

- NBB, NBO and NBBO
 - The term “NBB” shall mean the national best bid, the term “NBO” shall mean the national best offer, and the term “NBBO” shall mean the national best bid and offer.
- PBB, PBO and PBBO
 - The term “Protected NBB” or “PBB” shall mean the national best bid that is a Protected Quotation, the term “Protected NBO” or “PBO” shall mean the national best offer that is a Protected Quotation, and the term “Protected NBBO” or “PBBO” shall mean the national best bid and offer that is a Protected Quotation.

Prices and Timestamps

- **Working price.** The term “Working price” shall mean the price at which an order is eligible to trade at any given time, which may be different from the limit price or display price of the order.
- **Displayed price.** The term “displayed price” shall mean the price at which a Limit Order is displayed, which may be different from the limit price or working price of the order.
- **Timestamp.** The term “timestamp” shall mean the effective time sequence assigned to an order for purposes of determining its priority ranking.

Time-in-Force Instructions

Orders must have one of the following time-in-force instructions.

1. **Immediate-or-Cancel (“IOC”).** An order that is to be executed in whole or in part as soon as such order is received. The portion not executed immediately on the Exchange or routed to another Trading Center is treated as cancelled and is not posted to the MIAX Pearl Equities Book.
2. **Regular Hours Only (“RHO”).** An order that is designated for execution only during Regular Trading Hours, which includes the Opening Process. An order with a time-in- force of RHO entered into the System before the opening of business on the Exchange will be accepted but not eligible for execution until the start of Regular Trading Hours.

Order Instructions

- **Do Not Route.** An order designated as Do Not Route is a non-routable order that will be ranked and executed on the MIAX Pearl Equities Book or cancelled. Unless otherwise instructed by the User, an order designated as Do Not Route will be subject to the price sliding process described in Section 8 of this User Manual.
- **Post Only.** An order designated as Post Only is a non-routable order that will be ranked and executed on the MIAX Pearl Equities Book pursuant to Exchange Rule 2616 and Exchange Rule 2617.
 - An order designated as Post Only will only remove liquidity from the MIAX Pearl Equities Book when:
 - The order is for a security priced below \$1.00; or
 - The value of such execution when removing liquidity equals or exceeds the value of such execution if the order instead posted to the MIAX Pearl Equities Book and subsequently provided liquidity including the applicable fees charged or rebates provided.
 - To determine at the time of a potential execution whether the value of such execution when removing liquidity equals or exceeds the value of such execution if the order instead posted to the MIAX Pearl Equities Book and subsequently provided liquidity, the Exchange will use the highest possible rebate paid and highest possible fee charged for such executions on the Exchange.
 - Unless otherwise instructed by the User, an order designated as Post Only will be subject to the price sliding process described below.
- **Displayed.** An instruction the User may attach to an order stating that the order is to be displayed by the System on the MIAX Pearl Equities Book. Unless the User elects otherwise, all orders eligible to be displayed on the MIAX Pearl Equities Book will be automatically defaulted by the System to Displayed.
- **Non-Displayed.** An instruction the User may attach to an order stating that any part of the order is not to be displayed by the System on the MIAX Pearl Equities Book.
- **Attributable.** An instruction to include the User's MPID or to identify as retail with an order that is designated for display (price and size) on an Exchange proprietary data feed.
- **Non-Attributable.** An instruction on an order that is designated for display (price and size) on an Exchange proprietary data feed to display that order on an anonymous basis.
- **Minimum Execution Quantity.** An instruction a User may attach to a non-displayed order requiring the System to execute the order only to the extent that a minimum quantity can be satisfied.
 - Upon entry, an order with the Minimum Execution Quantity instruction will execute against individual orders resting on the MIAX Pearl Equities Book that each satisfy the order's minimum quantity condition. If there are orders that satisfy the minimum quantity condition, but there are also orders that do not satisfy the minimum quantity condition, the order with the Minimum Execution Quantity instruction will execute against orders resting on the MIAX Pearl Equities Book in accordance with

Rule 2616, Priority of Orders, until it reaches an order that does not satisfy the minimum quantity condition, and then the remainder of the order will be posted to the MIAX Pearl Equities Book or cancelled in accordance with the terms of the order.

- A User may alternatively specify that the incoming order's minimum quantity condition need not be satisfied by each individual resting order and that the order's minimum quantity condition be satisfied by one or multiple orders resting on the MIAX Pearl Equities Book that in the aggregate satisfy the order's minimum quantity condition.
 - Where there is insufficient size to satisfy an incoming order's minimum quantity condition, that incoming order with a Minimum Execution Quantity instruction with a time-in-force of RHO will not trade and will be posted on the MIAX Pearl Equities Book.
 - When posted on the MIAX Pearl Equities Book, the order may only execute against individual incoming orders with a size that satisfies the minimum quantity condition.
 - An order with the Minimum Execution Quantity instruction cedes execution priority when it would lock or cross an order against which it would otherwise execute if it were not for the minimum quantity condition.
- **Reserve Quantity.** An instruction a User may attach to an order where a portion of the order is displayed ("Displayed Quantity") and with a portion of the order non-displayed ("Reserve Quantity").
 - Upon entry, both the Displayed Quantity and the Reserve Quantity are eligible to trade with resting interest on the MIAX Pearl Equities Book or route to away markets. When resting, both the Displayed Quantity and Reserve Quantity are available for execution against incoming and Aggressing orders.
 - A User must select the initial Displayed Quantity ("Max Floor") when entering an order with a Reserve Quantity. The Max Floor is also used to determine the replenishment amount. The Max Floor must be entered in round lots. If the Displayed Quantity is reduced to less than a round lot, the System will replenish the Displayed Quantity from the Reserve Quantity using one of the following replenishment options in accordance with the User's instruction.
 - Replenishment Options
 - Fixed Replenishment. An instruction where System will replenish the Displayed Quantity to equal the Max Floor designated by the User. This is the default Replenishment option.
 - Random Replenishment. An instruction where replenishment quantities are randomly determined by the System within a replenishment range established by the User. The User entering an order into the System subject to the Random Replenishment instruction must select a replenishment value and a Max Floor. The initial Displayed Quantity and replenishment quantities will be determined by the System by randomly selecting a number of shares in a Round Lot size within a replenishment range that is equal to or between: (i) the Max Floor minus the replenishment value; and (ii) the Max Floor plus the replenishment value.
 - The Displayed Quantity of the order is provided displayed priority pursuant to Exchange Rule 2616(a)(2)(A)(i) and the Reserve Quantity is provided non-displayed priority pursuant to Exchange Rule 2616(a)(2)(A)(ii).

Order Types

- **Market Order**

- An order to buy (sell) a stated amount of a security that is to be executed at the PBO (PBB) or better. A Market Order shall not trade through a Protected Quotation.
- A Market Order may include a time-in-force of IOC.
- A Market Order may only include a time-in-force of RHO when it is to be routed pursuant to the PAC routing strategy. All other Market Orders that include a time-in-force of RHO will be rejected.
- A Market Order is not eligible to participate in the Opening Process. A Market Order is eligible to participate in the Regular Trading Session.
- A Market Order may include a Maximum Execution Quantity.
- A Market Order may not include a Post Only instruction.
- A Market Order may not include a Reserve Quantity.

- **Limit Order**

- An order to buy or sell a stated amount of a security at a specified price or better. A “marketable” Limit Order to buy (sell) will trade with all orders to sell (buy) priced at or below (above) the PBO (PBB) for the security. Once no longer marketable, the Limit Order will be ranked on the MIAX Pearl Equities Book. An incoming Limit Order may be designated as ISO.
- A Limit Order may include a time-in-force of IOC or RHO. A Limit Order with a time-in-force of RHO is eligible to participate in the Opening Process. A Limit Order is eligible to participate in the Regular Trading Session.
- A Limit Order may be displayed or non-displayed, based upon a user’s selection.
 - A displayed Limit Order may include a Reserve Quantity.
 - A non-displayed Limit Order may include a Maximum Execution Quantity.
- A Limit Order may be designated as Attributable.
- A Limit Order may be designated as Post Only or Do Not Route.
 - Unless designated as Post Only or Do Not Route, a marketable Limit Order to buy (sell) will be eligible to be routed away to prices equal to or higher (lower) than the PBO (PBB) only after trading with orders to sell (buy) on the MIAX Pearl Equities Book at each price point.

- **Midpoint Peg Order**

- A non-displayed Limit Order that is assigned a working price pegged to the midpoint of the Protected NBBO (PBBO). A Midpoint Peg Order receives a new timestamp each time its working price changes in response to changes to the midpoint of the PBBO.
- A Midpoint Peg Order will be accepted but will not be eligible for execution when the PBB and/or PBO is not available, the PBBO is crossed, and, if instructed by the User, when the PBBO is locked.
 - A Midpoint Peg Order that is eligible for execution when the PBBO is locked will be executable at the locking price. A Midpoint Peg Order will become eligible for execution and receive a new timestamp when the PBB and/or PBO both become available, or the PBBO unlocks or uncrosses and a new midpoint of the PBBO is established. In such case, all such Midpoint Peg Orders will retain their priority as compared to each other based upon the time priority of such orders immediately prior to being deemed not eligible for execution.

- A Midpoint Peg Order may include a time-in-force of IOC or RHO. A Midpoint Peg Order with a time-in-force of RHO is eligible to participate in the Opening Process. A Midpoint Peg Order is eligible to participate in the Regular Trading Session.
 - A Midpoint Peg Order cannot be displayed. It must be non-displayed.
 - A Midpoint Peg Order is not eligible for routing.
 - A Midpoint Peg Order may be designated as Post Only.
 - A Midpoint Peg Order cannot include a Reserve Quantity.
 - A Midpoint Peg Order may include a Minimum Execution Quantity.
 - A Midpoint Peg Order may not be designated as ISO.
- **Primary Peg Order**
 - A Limit Order to buy (sell) that is assigned a working price pegged to the PBB (PBO), subject to its limit price. For purposes of determining the working price of a Primary Peg Order to buy (sell), the Exchange will not take into account a displayed Primary Peg Order to buy (sell) resting on the MIAX Pearl Equities Book.
 - A Primary Peg Order to buy (sell) with a limit price that is equal to or higher (lower) than its pegged price will be assigned a working price equal to its pegged price and may execute up (down) to and including its pegged price subject to its limit price. A Primary Peg Order to buy (sell) with a limit price that is lower (higher) than its pegged price will be assigned a working price equal to its limit price and may execute up (down) to its limit price.
 - A User may, but is not required to, select an offset equal to or greater than one minimum price variation ("MPV") for the security ("Primary Offset Amount").
 - The Primary Offset Amount for a non-displayed Primary Peg Order may be above or below the PBB or PBO that the order is pegged to.
 - The Primary Offset Amount for a displayed Primary Peg Order to buy (sell) must result in the working price of such order being inferior to or equal to the PBB (PBO).
 - A Primary Offset Amount for an order to buy (sell) that is not in the applicable MPV for the security will be rounded down (up) to the nearest price at the applicable MPV.
 - A Primary Peg Order will be non-displayed on the MIAX Pearl Equities Book, unless the User elects that the order be displayed.
 - A displayed Primary Peg Order may be designated as Attributable.
 - A Primary Peg Order may include a time-in-force of IOC or RHO. A Primary Peg Order with a time-in-force of RHO is eligible to participate in the Opening Process. A Primary Peg Order is eligible to participate in the Regular Trading Session.
 - A Primary Peg Order is not eligible for routing.
 - A Primary Peg Order may be designated as Post Only.
 - A Primary Peg Order cannot include a Reserve Quantity.
 - A Primary Peg Order may include a Minimum Execution Quantity.
 - A Primary Peg Order may not be designated as ISO.

For further details on permitted order instruction combinations for each order type, please reference the Order Type Combinations Guide in the [MIAX Knowledge Center](#).

Intermarket Sweep Orders

The System will accept incoming Intermarket Sweep Orders ("ISO") (as such term is defined in Rule 600(b)(31) of Regulation NMS).

To be eligible for treatment as an ISO:

1. The order must be a Limit Order
2. The order must be marked ISO
3. The User entering the order must simultaneously route one or more additional Limit Orders marked "ISO," as necessary, to away Trading Centers to execute against the full displayed size of any Protected Quotation for the security.

Such orders may be immediately executed at one or multiple price levels without regard to Protected Quotations at away Trading Centers consistent with Regulation NMS (i.e., may trade through such quotations and will not be rejected or cancelled if it would lock, cross, or be marketable against an away Trading Center).

The Exchange relies on the marking of an order as ISO when handling such order, and thus, it is the entering Equity Member's responsibility, not the Exchange's responsibility, to comply with the requirements of Regulation NMS relating to ISOs.

ISOs are not eligible for routing.

An ISO may include a time-in-force of IOC or RHO.

- **IOC.** An ISO that includes a time-in-force of IOC will immediately trade with contra-side interest on the MIAx Pearl Equities Book up to its full size and limit price and any unexecuted quantity will be immediately cancelled.
 - A User entering a ISO with a time-in-force of IOC represents that such User has simultaneously routed one or more additional Limit Orders marked "ISO," if necessary, to away Trading Centers to execute against the full displayed size of any Protected Quotation for the security with a price that is superior to the limit price of the ISO entered in the System.
- **RHO.** An ISO that includes a time-in-force of RHO, if marketable on arrival, will immediately trade with contra-side interest on the MIAx Pearl Equities Book up to its full size and limit price.
 - Any unexecuted quantity of an ISO that is displayed with a time-in-force of RHO will be displayed at its limit price on the MIAx Pearl Equities Book and may lock or cross a Protected Quotation of an away Trading Center that was displayed at the time of arrival of the RHO ISO.
 - A User entering an ISO with a time-in-force of RHO represents that such User has simultaneously routed one or more additional Limit Orders marked "ISO," if necessary, to away Trading Centers to execute against the full displayed size of any Protected Quotation for the security with a price that is superior or equal to the limit price of the ISO entered in the System.

Order Entry Price and Size Increments

The minimum quotation increment for quotations of \$1.00 or above in all Equity Securities shall be \$0.01. The minimum quotation increment in the System for quotations below \$1.00 in Equity Securities shall be \$0.0001.

The unit of trading in stocks is one (1) share. 100 shares constitutes a “round lot,” unless specified by the primary listing market to be fewer than 100 shares. Any amount less than a round lot shall constitute an “odd lot,” and any amount greater than a round lot that is not a multiple of a round lot shall constitute a “mixed lot.”

Securities Listed on MIAX Pearl Equities

All NMS securities qualifying for UTP privileges will be listed to trade on MIAX Pearl Equities. A complete list of all equities traded on MIAX Pearl Equities will be maintained in the Listings section of the Exchange’s website.

8. Trading on MIAX Pearl Equities

Price Sliding Process

All Limit Orders

- With a Displayed Instruction follow the Display Price Sliding Process.
- With a Non-Displayed Instruction follow the Non-Display Price Sliding Process.
- **Display Price Sliding Process**
 - An order to buy (sell) designated as Displayed that, if displayed at its limit price on the MIAX Pearl Equities Book upon entry, would create a violation of Rule 610(d) of Regulation NMS by locking or crossing the PBO (PBB) of an Away Trading Center will be assigned a working price equal to the PBO (PBB) and a displayed price one (1) minimum price variation below (above) the current PBO (PBB).
 - A User may elect to have the System only apply the Display Price Sliding Process to the extent a display-eligible order to buy (sell) at the time of entry would create a violation of Rule 610(d) of Regulation NMS by locking the PBO (PBB) of an away Trading Center.
 - For Users that select this order handling, any order to buy (sell) will be cancelled if, upon entry, such order would create a violation of Rule 610(d) of Regulation NMS by crossing the PBO (PBB) of an away Trading Center.
 - An order subject to the Display Price Sliding Process will retain its original limit price irrespective of the working and displayed price assigned to the order.
 - In the event the PBBO changes such that an order to buy (sell) subject to the Display Price Sliding Process would no longer lock or cross the PBO (PBB) of an away Trading Center, the order will receive a new timestamp and will be assigned a working and displayed price at the most aggressive permissible price.
 - All orders that are assigned new working and displayed prices pursuant to the Display Price Sliding Process will retain their priority as compared to other orders subject to the Display Price Sliding Process based upon the time such orders were initially received by the Exchange.
 - Following the initial ranking and display of an order subject to the Display Price Sliding Process, an order will only be assigned a new working and displayed price to the extent it achieves a more aggressive price, provided, however, that the Exchange will assign an order a working price equal to the displayed price of the order in the event such order's displayed price is locked or crossed by a Protected Quotation of an away Trading Center. Such event will not result in a change in priority for the order at its displayed price.
 - The working and displayed prices of an order subject to the Display Price Sliding Process may be adjusted once or multiple times depending upon the instructions of a User and changes to the prevailing PBBO.
 - Unless otherwise instructed by the User, the System will only adjust the working and displayed prices of an order upon entry and then the displayed price one additional time following a change to the prevailing PBBO. The working and displayed prices of orders

subject to the optional multiple price sliding process will be adjusted, as permissible, based on changes to the prevailing PBBO.

- Any display-eligible order to buy (sell) designated as Post Only that locks or crosses the PBO (PBB) displayed by the Exchange upon entry will be executed as set forth in Exchange Rule 2614(c)(2) or cancelled. Depending on User instructions, a display-eligible order to buy (sell) designated as Post Only that locks or crosses the PBO (PBB) displayed by an away Trading Center upon entry will be subject to the Display Price Sliding Process.
 - In the event the PBBO changes such that an order designated as Post Only subject to the Display Price Sliding Process will be assigned a working price at which it could remove displayed liquidity from the MIAX Pearl Equities Book, the order will be executed as set forth in proposed Exchange Rule 2614(c)(2) or cancelled.
- **Non-Display Price Sliding Process**
 - To avoid potentially trading through Protected Quotations of an away Trading Center, a non-displayed, non-routable order to buy (sell) that, upon entry, would cross the PBO (PBB) of an Away Trading Center will be assigned a working price equal to the PBO (PBB).
 - In the event the PBO (PBB) changes such that the working price of a non-displayed order to buy (sell) resting on the MIAX Pearl Equities Book would again cross the PBO (PBB) of an external market, the working price of the non-displayed order to buy (sell) will be adjusted to be equal to the updated PBO (PBB) and will receive a new timestamp.
 - In the event a non-displayed order to buy (sell) has been re-priced, the non-displayed order to buy (sell) will not be re-priced unless it again crosses the PBO (PBB) or it achieves a more aggressive price due to an update in the PBO (PBB).

Priority of Orders

All non-marketable orders are ranked and maintained in the MIAX Pearl Equities Book according to price-time priority in the following manner: (1) price; (2) priority category; (3) time; and (4) ranking restrictions applicable to an order or modifier condition.

- **Price.** All orders are ranked based on the working price of an order. Orders to buy are ranked from highest working price to lowest working price. Orders to sell are ranked from lowest working price to highest working price. If the working price of an order changes, the price priority of the order changes.
- **Priority Category**
 - Within each priority category, where orders to buy (sell) are entered into the System and resting in the MIAX Pearl Equities Book at the same working price, the order clearly established as the first entered into the System at such particular price shall have precedence at that price, up to the number of shares specified in the order. The System shall rank equally priced trading interest within each priority category in time priority in the following order:
 - Displayed Limit Orders: Non-marketable Limit Orders for which their working price is displayed.
 - Non-Displayed Orders: Non-marketable Limit Orders for which their working price is non-displayed.

- **Time**

- Within each priority category, orders are ranked based on time priority.
 - An order is assigned a timestamp based on its original entry time, which is the time when an order is first placed in the MIAX Pearl Equities Book.
 - An order is assigned a new timestamp any time the working price of an order changes.

Odd Lot Handling

Round lot, mixed lot and odd lot sized orders are treated in the same manner on the Exchange.

When determining the PBB (PBO) that is disseminated on both the TOM feed and to the SIP, orders to buy (sell), whether odd lot, mixed lot or round lot, may be aggregated across one or more price levels to form a round lot. The PBB (PBO) will always be reflected as a round lot or multiple of a round lot.

Routing to Away Trading Centers

Routing services are provided for routing to all Equities Exchanges in the United States and are fully compliant with Reg NMS.

The MIAX Pearl Equities System accepts and routes routable orders received via FOI and MEO.

Routing Strategies

MIAX Pearl Equities supports the following Routing Strategies:

1. **Order Protection.** Order Protection is a routing strategy under which an order checks the System for available shares and then is routed to attempt to execute against Protected Quotations at away Trading Centers. All routable orders will be defaulted to the Order Protection routing strategy.
2. **Route to Primary Auction (“PAC”).** PAC is a routing strategy for Market Orders and displayed Limit Orders designated as RHO that the entering firm wishes to designate for participation in the opening, re-opening (following a regulatory halt, suspension, or pause), or closing process of a primary listing market (Cboe BZX, NYSE, Nasdaq, NYSE American, or NYSE Arca) if received before the opening, re-opening, or closing process of such market. The System will designate such orders routed pursuant to the PAC routing strategy with the time-in-force accepted by the primary listing market. Displayed Limit Orders coupled with the PAC routing strategy will be eligible to be routed pursuant to the PI routing strategy described directly below when resting on the MIAX Pearl Equities orderbook in continuous trading.
3. **Price Improvement (“PI”).** PI is a routing strategy that will route a displayed Limit Order coupled with the PAC routing strategy to multiple destinations simultaneously at a single price level. PI is not an independent routing strategy and may not be selected individually upon order entry.

Routing Process

Unless a User elects that the order be non-routable, the order shall be eligible for routing as follows:

• Market Orders

- The System will designate Market Orders that are fully or partially routed to an away Trading Center as IOC and will cause such orders to be routed for execution to one or more Trading Centers for potential execution, per the entering User's instructions, in compliance with Rule 611 under Regulation NMS, Regulation SHO, and the Limit-Up Limit-Down Plan.
- After the System receives responses to orders that were routed away, to the extent an order is not executed in full through the routing process, the System will cancel any unexecuted portion back to the User.

• Limit Orders

- The System will designate marketable Limit Orders that are fully or partially routed to an away Trading Center as IOC and will cause such orders to be routed for execution to one or more Trading Centers for potential execution, per the entering User's instructions, in compliance with Rule 611 under Regulation NMS, Regulation SHO, and the Limit-Up Limit-Down Plan.
- After the System receives responses to orders that were routed away, to the extent an order is not executed in full through the routing process, the System will process the balance of such order in accordance with the parameters set by the User when the order was originally entered. As such, the System will:
 - Cancel the unfilled balance of the order back to the User;
 - Process the unfilled balance of an order as an order designated as Do Not Route subject to the price sliding process
 - Execute the order against the MIAX Pearl Equities Book and/or re-route the order to other Trading Centers until the original incoming order is executed in its entirety or its limit price is reached.
 - If the order's limit price is reached, the order will be posted in the MIAX Pearl Equities Book, subject to the applicable price sliding process.

Unexecuted Interest

- An order that is fully routed to an away Trading Center on arrival is not assigned a timestamp unless and until any unexecuted portion of the order returns to the MIAX Pearl Equities Book.
- For an order that is partially routed to an away Trading Center on arrival, the portion that is not routed is assigned a timestamp.
- If any unexecuted portion of the order returns to the MIAX Pearl Equities Book and joins any remaining resting portion of the original order, the returned portion of the order is assigned the same timestamp as the resting portion of the order.
- If the resting portion of the original order has already executed and any unexecuted portion of the order returns to the MIAX Pearl Equities Book, the returned portion of the order is assigned a new timestamp.

Opening Process

Order Entry and Cancellation before the Opening Process

- Prior to the beginning of Regular Trading Hours, Users who wish to participate in the Opening Process may enter orders to buy or sell that are designated as RHO. Orders cancelled before the Opening Process will not participate in the Opening Process.
- Only orders that include a time-in-force of RHO may participate in the Opening Process. Orders designated as ISO and orders that include a time-in-force other than RHO are not eligible to participate in the Opening Process.
 - While orders with a time-in-force of RHO that include a Post Only or Minimum Execution Quantity instruction are accepted prior to the Opening Process, such orders are not eligible to participate in the Opening Process.

Performing the Opening Process

- During the Opening Process, the Exchange attempts to match eligible buy and sell orders at the midpoint of the NBBO. Orders that are not eligible to participate in the Opening Process are not considered as part of this match attempt.
- All orders eligible to trade at the midpoint will be processed in time sequence, beginning with the order with the oldest timestamp.
- The Opening Process will conclude when no remaining eligible orders, if any, can be matched at the midpoint of the NBBO.
- At the conclusion of the Opening Process, the unexecuted portion of orders that were eligible and orders ineligible to participate in the Opening Process will be placed on the MIAX Pearl Equities Book in time sequence, cancelled, executed, or routed to away Trading Centers in accordance with the terms of the order.
- All Self-Trade Protection modifiers will be honored during the Opening Process.

Opening Price

The price of the Opening Process will be the midpoint of the NBBO, which will be determined as follows:

- When the primary listing exchange is the NYSE or NYSE American, the Opening Process will be priced at the midpoint of the:
 - First NBBO subsequent to the first reported trade and first two-sided quotation on the primary listing exchange after 9:30:00 a.m. Eastern Time; or
 - Then prevailing NBBO when the first two-sided quotation is published by the primary listing exchange after 9:30:00 a.m. Eastern Time, but before 9:45:00 a.m. Eastern Time if no first trade is reported by

the primary listing exchange within one second of publication of the first two-sided quotation by the primary listing exchange.

- For any other primary listing exchange, the Opening Process will be priced at the midpoint of the first NBBO subsequent to the first two-sided quotation published by the primary listing exchange after 9:30:00 a.m. Eastern Time.

Contingent Open

If the conditions to establish the price of the Opening Process above do not occur by 9:45:00 a.m. Eastern Time, the Exchange will match all orders eligible to participate in the Opening Process at the midpoint of the then prevailing NBBO. If the midpoint of the NBBO is not available, all orders will be handled in time sequence, beginning with the order with the oldest timestamp, and be placed on the MIAX Pearl Equities Book, cancelled, executed, or routed to away Trading Centers in accordance with the terms of the order.

Trading Halts and Re-Opening Process

The System will automatically halt trading when trading in an NMS security is halted, suspended or paused on the security's primary listing exchange. Under certain circumstances, in the interest of a fair and orderly market, the Exchange may elect to manually halt trading in an individual NMS security, or all NMS securities Exchange wide.

Re-Opening After a Halt

While an Equity Security is subject to a halt, suspension, or pause in trading, the Exchange will accept orders for queuing prior to the resumption of trading in the security for participation in the Re-Opening Process.

The Re-Opening Process will occur in the same manner as the Opening Process, with the following exceptions:

- Orders with an ISO instruction and orders that include a time-in-force of IOC will be cancelled or rejected, as applicable
- Orders with a time-in-force of RHO that include a Post Only instruction or a Minimum Execution Quantity instruction will be accepted and retained during a halt but are not eligible to participate in the Re-Opening Process
- The Re-Opening Process will occur at the midpoint of the:
 - First NBBO subsequent to the first reported trade and first two-sided quotation on the primary listing exchange following the resumption of trading after a halt, suspension, or pause; or,
 - NBBO when the first two-sided quotation is published by the primary listing exchange following the resumption of trading after a halt, suspension, or pause if no first trade is reported by the listing exchange within one second of publication of the first two-sided quotation by the listing exchange.

Where neither of the conditions required to establish the price of the Re-Opening Process have occurred, the Equity Security may be opened for trading at the discretion of the Exchange. In such case, all orders will be handled in time sequence, beginning with the order with the oldest timestamp, and be placed on the MIAX Pearl Equities Book.

Limit Up-Limit Down Plan (LULD)

A Limit Order to buy (sell) that is priced above (below) the Upper (Lower) Price Band shall be re-priced pursuant to Exchange Rule 2622(e), unless the User affirmatively elects to have the order immediately cancelled.

Any portion of a Market Order to buy (sell) will be cancelled if it cannot be executed because at the time it is received by the System the NBO (NBB) is greater (less) than the Upper (Lower) Price Band in accordance with the LULD Plan. In such case, a Market Order to buy (sell) cannot execute against the NBO (NBB) because the NBO (NBB) is outside of the applicable Price Band and, therefore, not available for execution.

Regulation SHO Plan (Reg SHO)

All short sale orders shall be identified as “short” or “short exempt” when entered into the System. If marked “short exempt,” the Exchange shall execute, display and/or route a short sale order marked “short exempt” without regard to any short sale price test restriction in effect during a Short Sale Period, as defined in Exchange Rule 2614(g)(3)(A).

The Exchange relies on the marking of an order as “short exempt” when handling such order, and thus, it is the entering Member’s responsibility, not the Exchange’s responsibility, to comply with the requirements of Regulation SHO relating to marking of orders as “short exempt.”

Short Sale Price Sliding Process

During a Short Sale Period, a Limit Order to sell that is designated as short and cannot be executed or displayed on the MIAX Pearl Equities Book at its limit price pursuant to Rule 201 of Regulation SHO will be re-priced to a Permitted Price, which is one MPV above the NBB, pursuant to the Short Sale Price Sliding Process, unless the User affirmatively elects to have the order immediately cancelled.

Market Wide Circuit Breaker (MWCB)

A trigger of a Level 1, Level 2 or Level 3 Market Wide Circuit Breaker is treated by the System as a Regulatory Trading Halt on the Primary Listing Market for every security.

MWCB Plan Details

- If a Level 1 Market Decline or a Level 2 Market Decline occurs after 9:30 a.m. and up to and including 3:25 p.m., or in the case of an early scheduled close, 12:25 p.m., MIAX Pearl Equities shall halt trading in all stocks for 15 minutes after a Level 1 or Level 2 Market Decline.
- MIAX Pearl Equities shall halt trading based on a Level 1 or Level 2 Market Decline only once per trading day. MIAX Pearl Equities will not halt trading if a Level 1 Market Decline or a Level 2 Market Decline occurs after 3:25 p.m., or in the case of an early scheduled close, 12:25 p.m.

- If a Level 3 Market Decline occurs at any time during the trading day, MIAX Pearl Equities shall halt trading in all stocks until the primary listing market opens the next trading day.
- If a primary listing market halts trading in all stocks, MIAX Pearl Equities will halt trading in all stocks until trading has resumed on the primary listing market or notice has been received from the primary listing market that trading may resume. If the primary listing market does not reopen a security within 15 minutes following the end of the 15-minute halt period, MIAX Pearl Equities may resume trading in that security.
- Nothing in Exchange Rule 2622 should be construed to limit the ability of MIAX Pearl Equities to otherwise halt, suspend, or pause the trading in any stock or stocks traded on MIAX Pearl Equities pursuant to any other Exchange rule or policy.

9. Risk Protections

Overview

MIAX Pearl Equities provides a number of per order, cumulative and trade risk metrics to firms to help them manage their exposure. These risk protections are highly customizable. Additionally, risk protections (excluding Duplicate Order Check and the Order Rate Check with Automatic Reset) are latency equalized i.e. there is no latency penalty for a member when opting into and leveraging a risk protection available on the exchange when entering an order as compared to a member not opting into the risk protection when entering an order.

Member Firms can configure different attributes for each of their order entry ports/sessions for the MIAX Pearl Equities Exchange. Changes can be requested for each attribute by sending an email to Trading Operations at TradingOperations@MIAxEquities.com or via MIAX's Member Firm Portal.

For additional details on the Port Configurations, please reference the Port Attributes document found here: <https://www.miaxequities.com/interface-specifications/pearl-equities>.

System Settings

All current system settings are located under the Regulatory tab on the Exchange's website, found here: <https://www.miaxequities.com/system-configuration/pearl-equities>.

Changes to system settings are also published by the Exchange as either Regulatory Alerts or Regulatory Circulars, as required.

Available Protections

Orders entered via FOI and MEO are provided the following risk protection mechanisms:

Per Order Risk Metrics

- **Mandatory Protections**
 - **Maximum Order Size Protection**
 - The Maximum Order Size Protection is the maximum total size of an order in shares permitted by the exchange. If the total size of an order or an Order Modification Request exceeds its Maximum Order Size threshold, the order or Order Modification Request will be rejected.
 - Optionally members will have the option to set custom Maximum Order Size thresholds for each of their sessions or MPIDs.
 - If an Equity Member does not provide MIAX Pearl Equities with a custom value for the Maximum Order Size protection, the default value established by the Exchange will be applied.
 - The default value will be posted to the Exchange's website and the Exchange will announce in advance any changes to the value via a Regulatory Circular.
 - **Limit Order Price Protection**
 - **Acceptance of Orders**
 - A Limit Order to buy (sell) will be rejected if it is priced at or above (below) the greater of a specified dollar and percentage away from the following:
 - PBO for Limit Orders to buy, the PBB for Limit Orders to sell;
 - If the above is unavailable, consolidated last sale price disseminated during the Regular Trading Hours on trade date; or
 - If neither of the above are available, the prior day's Official Closing Price identified as such by the primary listing exchange, adjusted to account for events such as corporate actions and news events.
 - If the Official Closing Price is to be applied as the Reference Price and a regulatory halt has been declared by the primary listing market during that trading day, Limit Order Price Protection will not be applied.
 - If the Reference Price cannot be determined, Limit Order Price Protection will not be applied.
 - Limit Order Price Protection thresholds for an order to buy (sell) that is not in the minimum price variation ("MPV") for the security will be rounded down (up) to the nearest price at the applicable MPV.

- Members may customize the specified dollar and percentages on a per session or per MPID basis across six different price ranges:

Order's Limit Price
Order's Limit Price < \$1
>=\$1 Order's Limit Price <\$10
>=\$10 Order's Limit Price <\$50
>=\$50 Order's Limit Price <\$100
>=\$100 Order's Limit Price <\$500
Order's Limit Price >=\$500

- If an Equity Member does not provide MIAX Pearl Equities specified dollar and percentage values for their order(s), default specified dollar and percentage values established by the Exchange will be applied.
 - The default specified dollar and percentage values will be posted to the Exchange's website and the Exchange will announce in advance any changes to those dollar and percentage values via a Regulatory Circular.
- **Applicability**
 - Limit Order Price Protection will be applied when an order is first eligible to trade. A Limit Order entered before the Regular Trading Session that becomes eligible to trade in the Regular Trading Session will become subject to Limit Order Price Protection when the Regular Trading Session begins.
- **Minimum Order Size Check**
 - Orders and Order Modification Requests must be entered in sizes that are in multiples of 1 share. This protection is not configurable.
- **Minimum Order Price Protection**
 - Orders and order modification requests with a limit price that is less than the Exchange-set Minimum Order Price will be rejected. This protection is not configurable.
- **Maximum Order Price Protection**
 - Orders and order modification requests with a limit price that is greater than the Exchange-set Maximum Order Price will be rejected. This protection is not configurable.
- **Price Tick Size Check**
 - All orders and order modification requests will be checked against the valid price increments in the security upon entry into the System. This check is not configurable.

- **Optional Protections – *By default, these protections will not be applied***
 - **Market Order Price Protection**
 - Members may request Market Orders to be rejected upon arrival if the contra-side PBBO price is not available. By default, this protection will not be applied. Members must enable this protection at the session level or MPID level.
 - **Maximum Order Notional Value Protection**
 - Maximum Order Notional Value is the maximum notional value in dollars permitted by the exchange for an order.
 - For Limit orders, the notional value of an order is calculated by multiplying the order's total size by the order's limit price.
 - For Market orders, the notional value of an order is calculated by multiplying the order's total size by the contra-side PBBO at the time of the order's arrival.
 - If the notional value of an order or an Order Modification Request exceeds its Maximum Order Notional Value threshold, then the order will be rejected upon entry into the system with an appropriate reason code.
 - Maximum Order Notional Value is an optional protection for orders. If the member does not set a Maximum Order Notional Value threshold, the notional value check will not be applied to the member's orders.
 - MIAX Pearl Equities will not set an exchange default for the Maximum Order Notional Value.
 - Members are able to enable this protection at the session level or MPID level, with the ability to set independent settings for Market Orders and Limit Orders.
 - **ISO Reject**
 - Members will have the option to reject any orders marked as ISO. Members are able to enable this protection at the session level or MPID level.
 - **Short Sale Reject**
 - Members will have the option to reject any orders marked as short sale. The default behavior will be to allow Short Sale activity. Members are able to enable this protection at the session level or MPID level.
 - **Short Sale Exempt Reject**
 - Members will have the option to reject any orders marked as short sale exempt. The default behavior will be to allow sell sale exempt activity. Members are able to enable this protection at the session level or MPID level.
 - **Market Order Reject**
 - Members will have the option to reject any market orders. The default behavior will be to allow market orders. Members are able to enable this protection at the session level or MPID level.

- **Average Daily Volume (ADV) Check**
 - Average Daily Volume (ADV) for a security will be determined as an average of all traded volume in the security over the past twenty trading days.
 - If the total size of an order or an Order Modification Request exceeds the ADV size threshold, then the order will be rejected upon entry into the system with an appropriate reason code.
 - If an Order Modification Request is rejected due to exceeding the ADV Size threshold, the original order will remain on the orderbook and will not be cancelled.
 - The ADV check threshold will be calculated as follows:
 - ADV multiplied by a custom percentage, set by the member as a full percent increment. Members are able to enable this protection with a custom percentage set at the session level or MPID level.
 - Additionally, when opting into the protection, the member will be required to configure a “minimum ADV” required in the security for the check to be applied. For example, a member may indicate that for any securities with an ADV of 3000 shares or less, the ADV check should not be applied.
 - Optionally, the member will be able to override any MPID and/or a Session ADV percentage for an individual security. This change will be able to be made intra-day.
- **Restricted Security List Check**
 - Members will have the option to individually configure each of their sessions or MPIDs to reject any orders sent in a security on a member’s Restricted Security List with an appropriate reason code.
 - This list will be set up using the Member Firm Portal by the member and may be changed multiple times intra-day by the member. Intra-day changes will be immediately effective in the system between the hours of 7:30 AM ET and 5:00 PM ET.
- **Regulation SHO Security List Check**
 - Members will have the option to individually configure each of their sessions or MPIDs to reject any orders marked as a Short Sale and Short Sale Exempt with an appropriate reason code, if the order received is in a security that falls within the firm’s Regulation SHO Restricted Security List.
 - This protection will be applied regardless of whether the Short Sale Price Test is currently in effect or not for the security.
 - This list will be set up using the Member Firm Portal by the member and may be changed multiple times intra-day by the member. Intra-day changes will be immediately effective in the system between the hours of 7:30 AM ET and 5:00 PM ET.
- **Non-Agency Reject**
 - Members will have the option to reject any orders with a capacity of Principal or Riskless Principal. The default behavior will be to allow all orders, regardless of capacity. Members are able to enable this protection at the session level or MPID level.
- **Override Capacity to Agency**
 - Members will be able to opt into an optional session configuration to override all orders received via the session to a Capacity of “Agency”, regardless of the Capacity stated on the order (Agency, Principal or Riskless Principal).

Cumulative Risk Metrics (CRM)

- **Maximum Gross and Net Notional Trade Value Protection**
 - MIAX Pearl Equities will provide members with the ability to limit their notional exposure aggregated across multiple trades or across all open orders for a Risk Protection Group, for a day, to a specified maximum value, for the following metrics:
 - Trade Value Protections
 - **Gross Notional Trade Value.** The sum of the notional values of a member's buy side and sell side trades for the day for that Risk Protection Group. i.e.
 - $\text{Gross Notional Trade Value} = (\text{Sum of Notional Value of Sell Side Trades}) + (\text{Sum of Notional Value of Buy Side Trades})$
 - **Net Notional Trade Value.** The absolute value of the difference between the sum of the notional value of all buy side trades and the sum of the notional value of all sell side trades for the day for that Risk Protection Group. i.e.
 - $\text{Net Notional Trade Value} = \text{Absolute Value of } [(\text{Sum of Notional Value of Buy Side Trades}) - (\text{Sum of Notional Value of Sell Side Trades})]$
 - Trades from both limit and market orders are included when calculating the member's current exposure.
 - Open Value Protections
 - **Gross Notional Open Value.** The sum of the notional values of a member's buy side and sell side open orders for that Risk Protection Group. i.e.
 - $\text{Gross Notional Open Value} = (\text{Sum of Notional Value of Sell Side Open Orders}) + (\text{Sum of Notional Value of Buy Side Open Orders})$
 - **Net Notional Open Value.** The absolute value of the difference between, the sum of the notional value of all buy side open orders and the sum of the notional value of all sell side open orders for that Risk Protection Group. i.e.
 - $\text{Net Notional Open Value} = \text{Absolute Value of } [(\text{Sum of Notional Value of Buy Side Open Orders}) - (\text{Sum of Notional Value of Sell Side Open Orders})]$
 - The scope of a Risk Protection Group must be one of the following:
 - MPID
 - Session
 - Multiple Sessions
 - Firm
 - This is an optional protection. No exchange default will be set for the protections.
 - The member will pick one of the following Risk Protection Group Trigger Actions that will be triggered on a best efforts basis when the member's value exceeds the threshold:
 - **CRM Block and Mass Cancel:**
 - The system will reject all subsequent new orders and cancel all open orders on the exchange for the specified Risk Protection Group.
 - **CRM Block Only:**
 - The system will reject all subsequent new orders, but will not cancel all open orders on the exchange for the specified Risk Protection Group.

- **Reset:** The member will not be able to reset with an automated message on the session. Members must contact MIA XPEARL Equities Trading Operations to reset a Risk Protection Group with a request to update the threshold to a value that is above the Risk Protection Group's current notional value. This request may also be submitted via the Member Firm Portal. This will be considered a permanent threshold change and will persist to the next day.
- **Duplicate Order Check**
 - **Overview**
 - Duplicate Order Check will provide all members with the ability to limit potentially erroneous duplicative orders on a session sent from the same MPID from being live on the exchange.
 - A duplicate order will be identified as a new order with the same signature: with the same MPID, side, price, quantity and security as the order sent before it via the same session.
 - The Duplicate Order Check is an optional protection applied at the session level.
 - **Settings**
 - **Duplicate Order Time Window (in milliseconds).** The rolling time window during which the Duplicate Order Count threshold must be hit.
 - **Duplicate Order Count.** The number of duplicate orders received during the Duplicate Order Time Window triggers the protection.
 - **Duplicate Order Trigger Action.** The action that would be enforced when the protection is triggered, one of the following must be selected:
 - Reject: All new orders received on the session for the MPID that triggered the protection will be rejected for the remainder of the rolling Duplicate Order Time Window.
 - Disable: All new orders received on the session for the MPID that triggered the protection will be rejected until a request is submitted to Trading Operations, either via email or through the Member Firm Portal, to reset the risk control on that session for that MPID.

- **Order Rate Check**
 - The Order Rate Check is designed to identify any irregularity in order entry behavior, the source of which could be a malfunctioning system or erroneous business activity.
 - There are two types of Order Rate Check that are offered:
 - **Order Rate Check with Automatic Reset**
 - **Order Rate Check with Manual Reset**
 - **Order Rate Check with Automatic Reset**
 - Members will have the ability to define custom thresholds to monitor the rate at which all incoming new Orders (regardless of Order Type, Routing Strategy, etc.), Order Modification Requests and Cancellation Requests are entered on the exchange for a Risk Protection Group, with the following scopes:
 - **Counting messages for a Session**
 - **Counting messages for a Session sent for an MPID**
 - **Counting messages for a Session sent for an MPID in a specific security**
 - Settings
 - Order Rate Time Window (in seconds): The rolling time window (or the look-back time period) during which the Order Count threshold must be breached.
 - Order Count: The Order Rate Protection is triggered when the amount of applicable messages exceeds the Order Count in the Order Rate Time Window.
 - Order Rate Trigger Action: The action that would be enforced when the Order Rate Protection is triggered.
 - Reject: All new Orders and Order Modification Requests received will be rejected for the remainder of the rolling Order Time Window. Order Cancellation Requests will continue to be accepted. These Order Cancellation Requests will not be counted for the Order Count while the threshold has been exceeded.
 - **Order Rate Check with Manual Reset**
 - Members will have the ability to define custom thresholds to monitor the rate at which all incoming new Orders (regardless of Order Type, Routing Strategy, etc.), Order Modification Requests and Cancellation Requests are entered on the exchange for a Risk Protection Group, with the following scopes:
 - **Counting messages for an MPID**
 - **Counting messages for a Session**
 - **Counting messages for multiple Sessions**
 - **Counting messages for a Firm**
 - Settings
 - Order Rate Time Window (in seconds): The rolling time window (or the look-back time period) during which the Order Count threshold must be breached.
 - Order Count: The Order Rate Protection is triggered when the amount of applicable messages equals the Order Count in the Order Rate Time Window.
 - Order Rate Trigger Action: The action that would be enforced when the Order Rate Protection is triggered.
 - Warning Only: The member will be notified via email and via the Member Firm Portal that the threshold has been breached. There will be no impact to the member's order entry activity or resting orders.

- Block Only: The system will reject all subsequent new orders received from the Risk Protection Group that triggered the Protection. There will be no impact to the member's resting orders.
- Block and Mass Cancel: The system will reject all subsequent new orders and cancel all open orders on the exchange for the Risk Protection Group that triggered the Protection.

Trade Risk Metrics

- **Trading Collar**

- **Overview**

- Except for orders that are eligible for the Opening Process, the Trading Collar prevents incoming orders, including those marked ISO, from executing at a price outside the Trading Collar price range, i.e. prevents buy orders from trading or routing at prices above the collar and prevents sell orders from trading or routing at prices below the collar.
 - The Trading Collar price range is calculated using the greater of numerical guidelines for clearly erroneous executions or a specified dollar value established by the Exchange.
 - Executions are permitted at prices within the Trading Collar price range, inclusive of the boundaries.
 - Upon entry, any portion of an order to buy (sell) that would execute at a price above (below) the Trading Collar Price is cancelled.

- **Reference Price**

- Consolidated last sale price disseminated during the Regular Trading Hours on trade date; or
 - If (1) is not available, the prior day's Official Closing Price identified as such by the primary listing exchange, adjusted to account for events such as corporate actions and news events.
 - If the Official Closing Price is to be applied as the Reference Price and a regulatory halt has been declared by the primary listing market during that trading day, the Trading Collar will not be applied.
 - In the absence of a Trading Collar Reference Price, the Exchange will suspend the Trading Collar function, in the interest of maintaining a fair and orderly market in the impacted security.

- **Trading Collar Calculation**

- The Exchange calculates the Trading Collar price range for a security by applying the Numerical Guideline and reference price (for market orders) to the Trading Collar Reference Price.
 - The result is added to the Trading Collar Reference Price to determine the Trading Collar Price for buy orders, while the result is subtracted from the Trading Collar Reference Price to determine the Trading Collar Price for sell orders.
 - The Trading Collar Price is not enforced throughout the life of the order nor re-applied once the order is resting on the MIAX Pearl Equities Book.
 - The Trading Collar Price for an order to buy (sell) that is not in the minimum price variation ("MPV") for the security, as defined in Exchange Rule 2612, will be rounded down (up) to the nearest price at the applicable MPV. The appropriate Trading Collar Price is assigned to all orders upon entry.

The Numerical Guideline used in the Trading Collar Price calculation is based on the table below:

Trading Collar Reference Price	Regular Trading Hours Numerical Guideline
Greater than \$0.00 up to and including \$25.00	10%
Greater than \$25.00 up to and including \$50.00	5%
Greater than \$50.00	3%

These percentages are based upon the numerical guidelines for clearly erroneous executions under Exchange Rule 2621. The specified dollar values will be posted to the Exchange's website and the Exchange will announce in advance any changes to the dollar value via a Regulatory Circular.

For Market Orders only, a User may select a dollar value lower than the specified percentages and dollar values described on an order by order basis. In such case, the dollar value selected by the User will override the dollar values and specific percentages set by the Exchange.

• Market Impact Collar

- The Market Impact Collar is an optional protection that is designed to prevent limit orders from executing at prices that are too far through the current market upon entry and adversely affecting the security's prices.
- Upon entry, any portion of a limit order to buy (sell) that has a Limit Price above (below) the Upper (Lower) Bound of the Market Impact Collar will be rejected back to the member with an appropriate reason.
- Members will be able to configure percentage and dollar limits for the following price ranges for each of their MPID(s) or Session(s):

Reference Price	Custom Percentage Amount	Custom Dollar Amount
Greater than \$3.00	X%	Cannot specify
\$0.75 up to including \$3.00	Y%	Cannot specify
Less than \$0.75	Z%	\$X.XX

- The Market Impact Collar Reference Price will be calculated as the mean price of eligible reported trades for the security over the immediately preceding five minute period.
- The Market Impact Collar will be calculated as follows:
 - Market Impact Collar Upper Bound (For a buy order):
 - Market Impact Collar Reference Price plus
 - Higher of
 - Custom Percentage Amount
 - Custom Dollar Amount (if Any)
 - Market Impact Collar Lower Bound (For a sell order);
 - Market Impact Collar Reference Price minus
 - Higher of
 - Custom Percentage Amount
 - Custom Dollar Amount (if Any)

- When setting up Market Impact Collar, the member must provide all of the custom percentage amounts for each price range as well as the custom dollar amount to set up a full risk profile for the protection.
 - The custom percentage amounts must be set as a full percent increment (i.e. 30%, 31%, etc).
 - The custom dollar must but be set as a full penny increment (i.e. \$0.75, \$0.76).
- **Self-Trade Protection (STP)**
 - If opted into, Self-Trade Protection will apply during the Opening Process, any Re-Opening Process and during Regular Trading.
 - **Self-Trade Protection Modifiers.** Any order designated with an STP modifier will be prevented from executing against a contra-side order also designated with an STP modifier and originating from the same MPID, Exchange Member identifier (Firm), Parent Group or trading group identifier (any such identifier, a “Unique Identifier”). The STP modifier on the order with the most recent timestamp controls the interaction between two orders marked with STP modifiers.
 - **Cancel Newest.** An order marked with the Cancel Newest modifier will not execute against a contra-side order marked with any STP modifier originating from the same Unique Identifier. The order with the most recent timestamp marked with the Cancel Newest modifier will be cancelled back to the originating User(s). The contra-side order with the older timestamp marked with an STP modifier will remain on the MIAX Pearl Equities Book.
 - **Cancel Oldest.** An order marked with the Cancel Oldest modifier will not execute against a contra-side order marked with any STP modifier originating from the same Unique Identifier. The order with the older timestamp marked with the STP modifier will be cancelled back to the originating User(s). The contra-side order with the most recent timestamp marked with the STP modifier will remain on the MIAX Pearl Equities Book.
 - **Decrement and Cancel.** An order marked with the Decrement and Cancel modifier will not execute against contra-side interest marked with any STP modifier originating from the same Unique Identifier. If both orders are equivalent in size, both orders will be cancelled back to the originating User(s). If both orders are not equivalent in size, the equivalent size will be cancelled back to the originating User(s) and the larger order will be decremented by the size of the smaller order, with the balance remaining on the MIAX Pearl Equities Book.
 - **Cancel Both.** An order marked with the Cancel Both modifier will not execute against contra-side interest marked with any STP modifier originating from the same Unique Identifier. The entire size of both orders will be cancelled back to the originating User(s).

Order Cancellation Capabilities

- **Auto Cancel on Disconnect (ACOD)**

- In the event a member's session with the exchange is disconnected, orders submitted via that session that are open on the Order Book can be cancelled automatically upon disconnect.
- Members must select one of the following actions on a session by session basis which will be enforced when the protection is triggered:
 - **Cancel All Open Orders.** All orders that were sent through this session and are open will be cancelled upon session disconnect.
 - **Do Not Cancel All Open Orders.** This will disable Auto Cancel on Disconnect and MIAX Pearl Equities will not cancel any open orders upon that session's disconnect. This is the default behavior for the session if the member does not opt in for ACOD.
- The ACOD feature is provided on a best effort basis. Executions can occur while the ACOD event is being processed.
- As the technical circumstances initiating a disconnect may vary, Firms may contact Trading Operations to confirm the status of ACOD eligible open orders remaining at MIAX Pearl Equities that were sent via the session(s) that disconnected. The execution reports resulting from cancels or trades during the disconnect can also be received upon a subsequent reconnect by the Firm on the same day.

- **Auto Cancel on System Failure (ACOSF)**

- In the event of a Matching Engine or gateway failure that prevents Firm's interaction with existing orders, members may request that their open orders are cancelled automatically for a given session. Orders submitted via any of the member's other sessions will not be affected. Additionally, orders submitted to any Matching Engines that are not impacted will not be affected.
- Members must select one of the following actions on a session by session basis which will be enforced when the protection is triggered:
 - **Cancel All Open Orders:** All open orders in the impacted Matching Engine(s) that were sent through this session will be cancelled upon system failure.
 - **Do Not Cancel All Open Orders:** This will disable Auto Cancel on System Failure and MIAX Pearl Equities will not cancel any open orders from that session upon system failure. This is the default behavior for the session if the member does not opt in for ACOSF.
- The ACOSF feature is provided on a best effort basis. Executions can occur while the ACOSF event is being processed.
- As the technical circumstances initiating an ACOSF may vary, Firms are advised to contact Trading Operations to confirm the status of ACOSF eligible open orders remaining at MIAX Pearl Equities. The execution reports resulting from cancels or trades during the failure can also be received upon a subsequent reconnect by the Firm on the same day.

• Mass Cancel Functionality

A member can use the Mass Cancel functionality to manage risk for themselves as well as their sponsored clients. The scope of a Mass Cancel Request or a Mass Cancel Reset request must be one of the following:

- **Firm Level (available via Member Firm Portal Only).** When a Mass Cancel Request is submitted at the Firm Level, all orders submitted from that Firm across the exchange, for any MPID and any Session, will be subject to the Mass Cancel Action.
- **Session Level (available via Member Firm Portal Only).** When a Mass Cancel Request is submitted at the Session Level, all orders submitted via that Session across the exchange, for any MPID, will be subject to the Mass Cancel Action.
- **MPID Level (available via Purge Port and Member Firm Portal).** When a Mass Cancel Request is submitted at the MPID Level, all orders submitted from that specific MPID across the exchange, from any Session, will be subject to the Mass Cancel Action.
- **MPID + Purge Group Level (available via Purge Port and Member Firm Portal).** When a Mass Cancel Request is submitted at the Purge Group Level, all orders submitted from that MPID with that Purge Group specified on the order across the exchange, from any Session, will be subject to the Mass Cancel Action.
- The member must select one from amongst the following Mass Cancel Actions that will be enforced when a Mass Cancel Request is received:
 - **Block Only:** The system will reject all subsequent new orders received from the specified scope. Existing orders on the book are not impacted. The system will additionally send a warning to Trading Operations indicating the action taken.
 - **Mass Cancel Only:** The system will cancel all open orders on the exchange for the specified scope. However, the system will not reject any subsequent new orders from the specified scope.
 - **Block and Mass Cancel:** The system will reject all subsequent new orders and cancel all open orders on the exchange for the specified scope.
 - A block can be reset as follows:

	Reset via Firm Portal	Reset via Purge Port	Reset via MEO/FOI Port
MPID Block via Purge Port	Yes	Yes	No
MPID + Purge Group Block via Purge Port	Yes	Yes	No
MPID + Purge Group Block via Firm Portal	Yes	No	No
MPID Block via Firm Portal	Yes	No	No
Session Block via Firm Portal	Yes	No	No
Firm Block via Firm Portal	Yes	No	No

10. Member Firm Portal

The Member Firm Portal (MFP) is a member-facing application available via the internet. The MFP provides members with the tools needed to view and manage their connectivity, sessions, risk protection configurations, market maker registrations, and orders and trades.

The Member Firm Portal is available for search queries at all times. If an Equities Market Maker uploads their symbol self-assignments or makes a modification to their symbol assignment list before 9:00 a.m., the change will be applied intra-day. However, if the registration list is uploaded or modified after 9:00 a.m., the change will be applied the next business day.

Additional information regarding the Member Firm Portal can be obtained by contacting MIAx Trading Operations at: TradingOperations@MIAxEquities.com.

11. MIAX Pearl Equities Rules

A copy of the complete MIAX Pearl Equities Rulebook is available in the Regulatory Section of the Exchange's website: <https://www.miaxequities.com/rulebook/MIAXPearl>.

Throughout this User's Manual, reference is made to MIAX Pearl Equities Rules. In the event of any conflict between a description or discussion of a Rule in this User's Manual and the Rules set forth in the MIAX Pearl Equities Rulebook, the Rulebook shall prevail.

12. MIAX Pearl Equities Fees

A link to a copy of the complete MIAX Pearl Equities Fee Schedule is available on the Exchange's website under the Fee Summary tab.

13. Clearly Erroneous Executions Policy

The terms of a transaction executed on the Exchange are “clearly erroneous” when there is an obvious error in any term, such as price, number of shares or other unit of trading, or identification of the security. A transaction made in clearly erroneous error and cancelled by both parties or determined by the Exchange to be clearly erroneous will be removed from the Consolidated Tape.

Requests for review must be received by the Exchange within thirty (30) minutes of execution time and shall include information concerning the time of the transaction(s), security symbol(s), number of shares, price(s), side (bought or sold), and factual basis for believing that the trade is clearly erroneous. Upon receipt of a timely filed request that satisfies the numerical guidelines set forth in paragraph (c)(1) of Exchange Rule 2621, the counterparty to the trade, if any, shall be notified by the Exchange as soon as practicable, but generally within thirty (30) minutes. An Official may request additional supporting written information to aid in the resolution of the matter. If requested, each party to the transaction shall provide any supporting written information as may be reasonably requested by the Official to aid resolution of the matter within thirty (30) minutes of the Official’s request. Either party to the disputed trade may request the supporting written information provided by the other party on the matter.

For routed executions, other market centers will generally have an additional thirty (30) minutes from receipt of their participant’s timely filing, but no longer than sixty (60) minutes from the time of the execution at issue, to file with the Exchange for review of transactions routed to the Exchange from that market center and executed on the Exchange.

For additional information on Clearly Erroneous Executions, please reference the MIAX Pearl Equities Rule 2621.

14. Contact MIAx Pearl Equities

Miami International Holdings, Inc.

Address: 7 Roszel Road, 1st Floor
Princeton, NJ 08540

Phone: (609) 897-7300

Area of Interest	Department	Email
Investor Inquiries	Investor Relations	Investor.Relations@MIAxEquities.com
Business Development	Business Development	info@MIAxEquities.com
Regulatory	Regulatory	Regulatory@MIAxEquities.com Primary: (609) 897-7309
Membership	Membership	Membership@MIAxEquities.com
Market Operations	Trading Operations	TradingOperations@MIAxEquities.com Primary: (609) 897-7302
Connectivity	Trading Operations	TradingOperations@MIAxEquities.com Primary: (609) 897-7302
Certification Testing	Trading Operations	TradingOperations@MIAxEquities.com Primary: (609) 897-7302
Interface Development	Trading Operations	TradingOperations@MIAxEquities.com Primary: (609) 897-7302
Market Data Requests	Market Data	MarketData@MIAxEquities.com
Market Data Usage Reporting	Market Data	MarketDataUsage@MIAxEquities.com
Listings	Listings	Listings@MIAxEquities.com Primary: (609) 897-7308
Sales and Marketing	Business Development	Sales@MIAxEquities.com Primary: (609) 897-8177
Billing	Billing	Billing@MIAxEquities.com



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