**MIAX Options Exchange**

# MIAX Order Feed (MOR)

# *Interface Specification*

**Revision Date: 05/17/2022**
**Version: 2.5b**

MIAX Options Exchange
MIAX Order Feed (MOR) | Interface Specification
Document Version: 2.5b
Latest Revision Date: 05/17/2022

miax™

# Table of Contents

MIAX Options Exchange
MIAX Order Feed (MOR) | Interface Specification
Document Version: 2.5b
Latest Revision Date: 05/17/2022

miax™

# 1. Overview

MIAX Order Feed (**MOR**) is a data feed that allows subscribers to receive real-time updates of the following information from the MIAX Options Market

- Options orders (Please refer to the rules as to the types of orders published)
- Products traded on MIAX
- MIAX Options System status
- MIAX Options Underlying trading status

MOR Features:

MOR messaging and the system architecture are designed for low latency and high throughput messaging. Some of the key features of the interface are:

- MOR uses binary message format, binary numeric fields and fixed length ASCII fields messages in order to utilize bandwidth efficiently and assist in achieving **low latency**. MOR messages use Product IDs in each message in place of a full canonical symbol.
- MOR is offered with redundant multicast feeds (A Feed & B Feed) to provide single point of failure hardware and network fault tolerance and to provide an opportunity for recipients to arbitrate the two feeds to auto-fill gaps.
- MOR real-time messages are disseminated over multicast to achieve a fair delivery mechanism. MOR requires the use of MIAX proprietary SesM over TCP/IP protocol for retransmission lines in order to provide a **guaranteed delivery** mechanism for gap fills.
- The MOR retransmission service also provides a 3.2.2 Last Value Refresh Service to facilitate fast intra-day recovery without a full day gap fill.
- MOR notifications provide current **electronic system status** allowing the subscribers to take necessary actions immediately.

This specification is intended to be used by MIAX MOR subscribers only.

## 1.1 Exchange Related Information

### 1.1.1 Hours of Operation for MIAX Options Exchange

Please refer to MIAX website at http://www.MIAXOptions.com for details about times for each of these events.

Note: Times specified below are in United States Eastern Time zone.

Start of Session: Start of dissemination of messages. After 5:00 a.m.

Trading Session for Equity Options: 9:30 a.m. to 4:00 p.m. (ends at 1:00 p.m. on early closing days).

Trading Session for ETF and Index Options: 9:30 a.m. to 4:15 p.m. (ends at 1:15 p.m. on early closing days).

MIAX Options Exchange
MIAX Order Feed (MOR) | Interface Specification
Document Version: 2.5b
Latest Revision Date: 05/17/2022

miax™

End of Order Cancel Acceptance: 4:25 p.m. (1:25 p.m. on early closing days). However, MIAX may send order messages following the end of order cancel acceptance due to manual actions of the trade desk for various operational reasons.

### 1.1.2 Obtaining More Information

Information such as (but not limited to) membership, rules, data feeds, fees and support can be obtained by sending an email to Trading Operations or by referring to MIAX website at http://www.MIAXOptions.com.

## 1.2 Testing of MOR Subscription

MIAX can provide testing assistance on the MIAX testing area for the MOR Feed and the MOR retransmission interface.

Please contact MIAX Trading Operations at TradingOperations@MIAXOptions.com or (609) 897-7302 to obtain more information about the aforementioned.

## 1.3 Answers to FAQs

*Subscription:* Please contact Trading Operations for details about subscribing to MOR.

*Symbol and Strategy management*: Subscribers to the data feed will get a list of all option symbols and strategies that will be traded and sourced on that feed at the start of every session.  If firms cannot start listening to the feed in time for the normal symbol and complex strategy broadcast, they can connect to the MOR Retransmission service and request for a Last Value Refresh Service (see section 3.2.2 Last Value Refresh Service) or request all messages published and then subsequently process only the symbol and strategy messages to build their symbol and/or strategy list. The MIAX assigned Product ID or Strategy ID of each option/strategy will be sent in every message so that firms can tie each message to an option symbol or strategy.

*Retransmission:* Gap-fill packets generated as a response to retransmission requests are only disseminated on the retransmission TCP channels and not on the real-time multicast feeds.

*Redundant Feeds*: In order to achieve higher availability, MIAX offers the real-time MOR feed in two separate redundant and identical feeds named "A Feed" and "B Feed".  Firms are advised to arbitrate between the two feeds in order to mitigate gaps and achieve higher availability. "A Feed" is the primary feed from the primary data center and "B Feed" is the secondary feed from the secondary data center.

*Refresh Service*: Refresh service is provided only on the retransmission TCP channels and does not affect the real-time MOR feed.
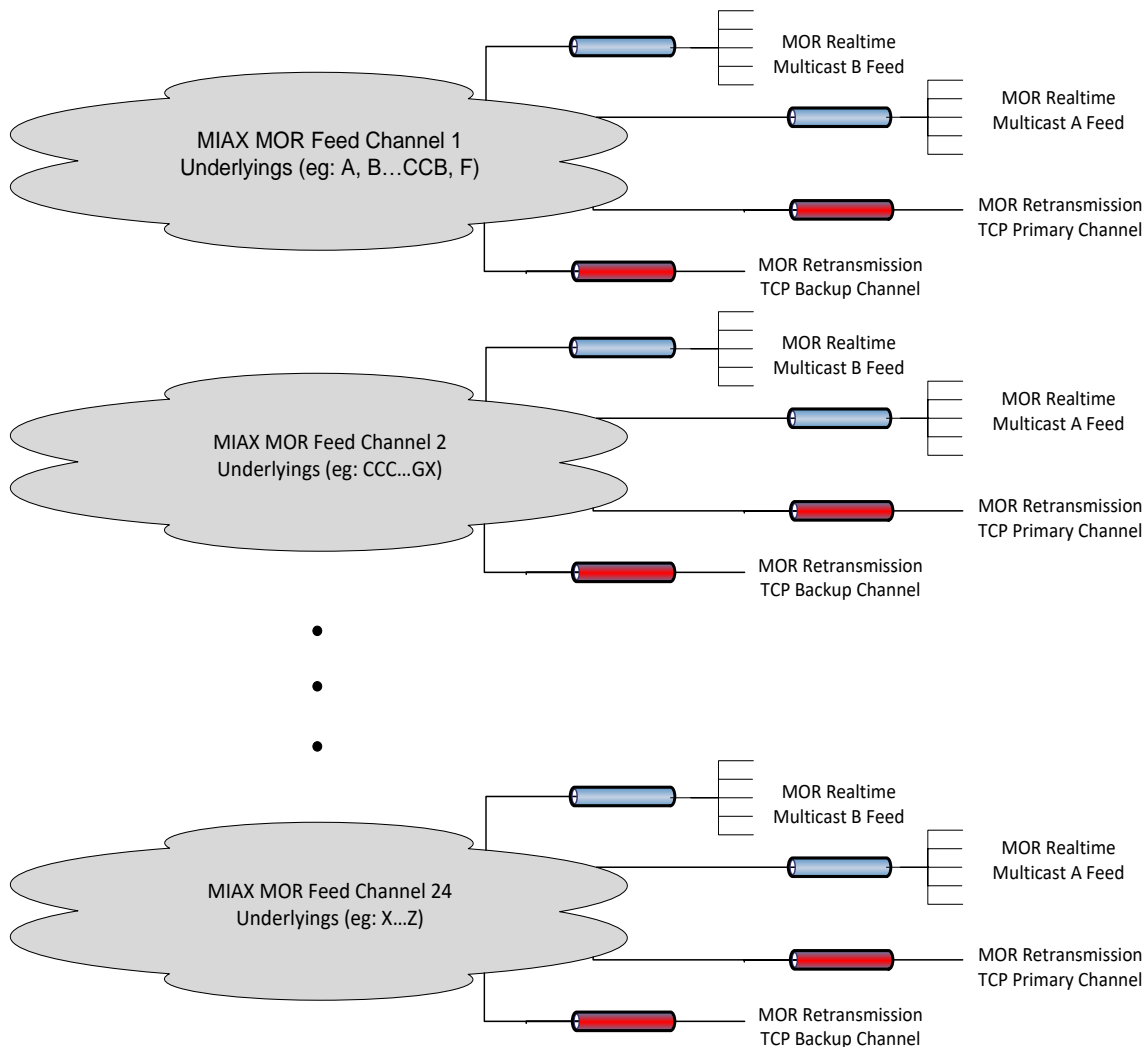
## 1.4 Data Types

The following table describes the data types used in MOR messaging:

**Note**: Time fields in all messages are as per timings of United States Eastern Time zone unless specified otherwise.

MIAX Options Exchange
MIAX Order Feed (MOR) | Interface Specification
Document Version: 2.5b
Latest Revision Date: 05/17/2022

miax™

| Data Type | Description |
|---|---|
| **BinaryU** | Unsigned, Intel x86 byte-ordered (**little-endian**), binary encoded numbers |
| **BinaryS** | Signed, Intel x86 byte-ordered (**little-endian**), binary encoded numbers |
| **BinaryPrc4U** | BinaryU Field with the last 4 (right most) digit places being decimal places |
| **BinaryPrc4S** | BinaryS Field with the last 4 (right most) digit places being decimal places |
| **SecTime** | BinaryU field that contain transaction time in seconds since Epoch (January 1, 1970, 00:00:00 **UTC**) |
| **NanoTime** | BinaryU field that contain transaction time in nanoseconds since past second |
| **Alphanumeric** | Each place can contain characters or numbers. Left justified and space-padded on the right |

MIAX Options Exchange
MIAX Order Feed (MOR) | Interface Specification
Document Version: 2.5b
Latest Revision Date: 05/17/2022

miax™

# 2. MOR Architecture

**MIAX Order Feed (MOR) Architecture**



Highlights:

- Real-time dissemination is separated out on to 24 separate Feed channels.
- A Feed channel will contain sourced data for all options for a single underlying.
- Any options for any given underlying will only be sourced by a single feed channel on any given day.
- Each Feed channel sources independently from the other groups and hence has independent sequence numbers.
- All the messages on each feed channel will be published in FIFO sequence.
- High availability is achieved by disseminating identical data on an "A Feed" and "B Feed" for each Feed channel

- Underlyings may not be contiguously distributed according to symbol ranges in each Feed channel.
- Two separate TCP based retransmission channels for each Feed channel supply MOR retransmission via the MOR Retransmission interface.

# 3. Session Level Protocol

## 3.1 Real-Time MOR Feed

MOR real-time feed uses MIAX's proprietary **MACH protocol**. Each MOR Packet may have multiple application messages and each application message is encapsulated in a MACH protocol packet. Hence a single MOR packet may contain 1 or more sequenced MACH protocol packets.

Please refer to MACH document (available at MIAX website) for details about MACH protocol. This protocol layer offers low latency application messaging over multicast, sequencing of messages and heartbeats.

## 3.2 MOR Retransmission Interface

MOR Retransmission Interface uses MIAX's proprietary **SesM – TCP Session Management Protocol**.
Please refer to the latest SesM TCP Session Management document (available at the MIAX website) for details about SesM session management protocol. This protocol layer offers session management capabilities such as authentication, application messaging over TCP/IP, sequencing of messages, heartbeats and gap fills.

Firms must first use the `Login Request` with a requested sequence number of **zero** to login to the Interface. After receiving a successful `Login Response`, the firm can choose either the 3.2.1 SesM Gap Fill Service or 3.2.2 Last Value Refresh Service.

### 3.2.1 SesM Gap Fill Service

Firms can use the **Retransmission Request** session management message, available in the SesM protocol, to request retransmission of a specific range of packets, identified by sequence numbers.

### 3.2.2 Last Value Refresh Service

### 3.2.2.1 Request Message to MIAX

Firms can use the **Unsequenced Data Packet,** available in the SesM protocol, to request a last value refresh of various market data and status information. The Refresh Request has the following format:

| Field Name | Length | Data Type | Notes |
|---|---|---|---|
| *SesM Packet Length* | 2 | Binary | |
| *SesM Packet Type* | 1 | Alphanumeric | 'U' – SesM Unsequenced Packet |
| Request Type | 1 | Alphanumeric | "R" – Refresh |
| Refresh Message Type | 1 | Alphanumeric | "P" - Series Update Refresh<br>"U" – Underlying Trading Status Refresh<br>"S" – System State Refresh<br>"C" – Complex Strategy Definition Refresh |

MIAX Options Exchange
MIAX Order Feed (MOR) | Interface Specification
Document Version: 2.5b
Latest Revision Date: 05/17/2022

miax™

### 3.2.2.2 Response Message From MIAX

The Retransmission feed will respond to the Refresh request with a series of SesM-TCP **Unsequenced Data Packets** based on the `Refresh Message Type`. Each response message will have the *following format:*

| Field Name | Length | Data Type | Notes |
|---|---|---|---|
| *SesM Packet Length* | 2 | Binary | |
| *SesM Packet Type* | 1 | Alphanumeric | 'U' – SesM Unsequenced Packet |
| Response Type | 1 | Alphanumeric | "R" –Refresh |
| Sequence Number | 8 | BinaryU | Original sequence number from live feed. |
| Application Message | varies | See section 4. Application Message Formats | Based on the message type requested. |

The first SesM TCP packet to be received by the firms will be the 4.1 MIAX System Time Message (see Section 4.1 MIAX System Time Message). The timestamp (combined with the nanosecond part in the subsequent messages) represents the most recent Matching Engine transaction time. It is ***not*** the original timestamp from the MACH sequenced messages in the live feed. *The sequence number in the refresh messages may be used to arbitrate with the sequenced packets from live feed (eg: data with higher sequence number from either the refresh or the live feed represents latest information).*

### 3.2.2.3 End of Refresh Notification from MIAX

When the refresh is complete MIAX will send the following message.

| Field Name | Length | Data Type | Notes |
|---|---|---|---|
| *SesM Packet Length* | 2 | Binary | |
| *SesM Packet Type* | 1 | Alphanumeric | 'U' – SesM Unsequenced Packet |
| Response Type | 1 | Alphanumeric | "E" – End of Request. |
| Refresh Message Type | 1 | Alphanumeric | from Refresh Request |

## 3.2.3 Session Termination

After satisfying the retransmission request, MOR Retransmission Interface will send a `Goodbye Packet` and disconnect the TCP connection.

**Note**: Upon receipt of an unknown, malformed or illegal session message, MIAX will send a SesM "Goodbye Packet" with a human readable reason text string and MIAX will disconnect the line.

# 4. Application Message Formats

This section consists of format of messages sent over the MOR feed.

The time specified in the *Timestamp* field in all the messages below is the time at which the Matching Engine associated with that underlying group published the message. This is the same timestamp that will get included in the messages transmitted on the retransmission interface.

## 4.1 MIAX System Time Message

This is the message format that will be used to disseminate the "seconds" part of the timestamp that is applicable to all messages that are sent in the current second.

| Field Name | Length | Data Type | Notes |
|---|---|---|---|
| *MACH Protocol Data* | | | Refer to MACH Protocol Specification |
| Message Type | 1 | Alphanumeric | "1" |
| Time Stamp | 4 | SecTime | Seconds part of the time that applies to all messages that gets disseminated until this message gets sent again. |

Points to note:
- Note that this message is only sent when there are any application messages that are going to be sent during any second. Firms are advised to not assume that there will be a message for every second of the day.

## 4.2 Simple Series Update

This is the message format that will be used to disseminate all Option series traded on MIAX for the current session.

| Field Name | Length | Data Type | Notes |
|---|---|---|---|
| *MACH Protocol Data* | | | *Refer to MACH Protocol Specification* |
| Message Type | 1 | Alphanumeric | "P" |
| Product Add/Update Time | 4 | NanoTime | Time at which this product is added/updated on MIAX system today. |
| Product ID | 4 | BinaryU | MIAX Product ID mapped to a given option. It is assigned per trading session and is valid for that session. |
| Underlying Symbol | 11 | Alphanumeric | Stock Symbol for the option. |
| Security Symbol | 6 | Alphanumeric | Option Security Symbol |
| Expiration Date | 8 | Alphanumeric | Expiration date of the option in YYYYMMDD format |
| Strike Price | 4 | BinaryPrc4U | Explicit strike price of the option. Refer to data types for field processing notes |
| Call or Put | 1 | Alphanumeric | Option Type |

MIAX Options Exchange
MIAX Order Feed (MOR) | Interface Specification
Document Version: 2.5b
Latest Revision Date: 05/17/2022

miax™

| Field Name | Length | Data Type | Notes |
|---|---|---|---|
| | | | "C" = Call<br>"P" = Put |
| Opening Time | 8 | Alphanumeric | Expressed in HH:MM:SS format. Eg: 09:30:00 |
| Closing Time | 8 | Alphanumeric | Expressed in HH:MM:SS format. Eg: 16:15:00 |
| Restricted Option | 1 | Alphanumeric | "Y" = MIAX will accept position closing orders only<br>"N" = MIAX will accept open and close positions |
| Long Term Option | 1 | Alphanumeric | "Y" = Far month expiration (as defined by MIAX rules)<br>"N" = Near month expiration (as defined by MIAX rules) |
| Active on MIAX | 1 | Alphanumeric | Indicates if this symbol is tradable on MIAX in the current session:<br>"A" = Active (tradable) on MIAX<br>"I" = Inactive (not tradable) on MIAX |
| MIAX BBO Posting Increment Indicator | 1 | Alphanumeric | This is the Minimum Price Variation as agreed to by the Options industry (penny pilot program) and as published by MIAX |
| Liquidity Acceptance Increment Indicator | 1 | Alphanumeric | This is the Minimum Price Variation for Quote/Order acceptance as per MIAX rules |
| Opening Underlying Market Code | 1 | Alphanumeric | Options opening will be triggered on receipt of Opening quote/trade from this Underlying market: |

MIAX BBO Posting Increment Indicator table:

| Indicator | BBO Increments | |
|---|---|---|
| | Price <= $3 | Price > $3 |
| "P" | Penny (0.01) | Penny (0.01) |
| "N" | Penny (0.01) | Nickel (0.05) |
| "D" | Nickel (0.05) | Dime (0.10) |

Liquidity Acceptance Increment Indicator table:

| Indicator | Quoting Increments | |
|---|---|---|
| | Price <= $3 | Price > $3 |
| "P" | Penny (0.01) | Penny (0.01) |
| "N" | Penny (0.01) | Nickel (0.05) |
| "D" | Nickel (0.05) | Dime (0.10) |

Opening Underlying Market Code table:

| Market Code | Description |
|---|---|
| A | NYSE Amex |
| B | NASDAQ OMX BX |
| C | National Stock Exchange |
| D | FINRA ADF |
| E | Market Independent (Any market that opens first) |
| H | MIAX PEARL Equities |
| I | International Securities Exchange |
| J | EDGA Exchange, Inc |
| K | EDGX Exchange, Inc |
| L | LTSE |

| Field Name | Length | Data Type | Notes | | |
|---|---|---|---|---|---|
| | | | **M** | Chicago Stock Exchange | |
| | | | **N** | NYSE Euronext | |
| | | | **P** | NYSE Arca Exchange | |
| | | | **Q** | NASDAQ OMX (via UTP Feed) | |
| | | | **T** | NASDAQ OMX (via CTA Feed) | |
| | | | **U** | MEMX | |
| | | | **V** | IEX | |
| | | | **W** | CBOE Stock Exchange (CBSX) | |
| | | | **X** | NASDAQ OMX PHLX | |
| | | | **Y** | BATS Y-Exchange, Inc | |
| | | | **Z** | BATS Exchange Inc | |
| **Priority Quote Width** | 4 | BinaryPrc4U | Maximum allowable width for a quote for this Option during regular trading in order to be considered as Priority Quote. 0 when Priority Quote Width is not applicable. | | |
| **Reserved** | 8 | BinaryU | ** Reserved for future use ** | | |

Points to note:
- Entire Options list will be disseminated at the start of day.
- In each channel, firms will only receive the series associated with the Engine that is servicing that channel.
- Intra-day updates will also be published as they occur.
- In case of an intra-day reconnection, users can request all Options series data from the MOR retransmission line.
- The Priority quote width specified in this message is not applicable to Opening. Please refer MIAX rules and circulars for details about priority quote width applicable during Opening.

## 4.3 System State

This message format is used to notify the firms of the state changes of the system. This is a notification that applies to each Underlying group. Firms can use notifications as triggers in their system to ensure electronic synchronization of systems.

| Field Name | Length | Data Type | Notes |
|---|---|---|---|
| *MACH Protocol Data* | | | Refer to MACH Protocol Specification |
| **Message Type** | 1 | Alphanumeric | "S" |
| **Notification Time** | 4 | NanoTime | Time at which this was generated by MIAX system. |
| **MOR Version** | 8 | Alphanumeric | Eg: MOR2.0 |
| **Session ID** | 4 | BinaryU | MIAX assigned ID for the current trading session |
| **System Status** | 1 | Alphanumeric | Current system status: "S" = Start of System hours "C" = End of System hours "1" = Start of Test Session (sent before tests). "2" = End of Test Session. |

Points to note:

- Firms must ensure that messages sent on the MOR Feed from the beginning of "start of test session" to the end of "end of test session" will not affect their production session while allowing the firms to still be involved in production tests and dry runs.
- A change in Session ID will mean that restarting at MACH sequence number 1 for that Underlying group. Refer to MACH protocol specification for details about this. Firms must be able to handle more than one trading session in a single trading day.

## 4.4 Underlying Trading Status Notification

This message format will be used to notify firms of changes to the trading status of all the options of an underlying.

| Field Name | Length | Data Type | Notes |
|---|---|---|---|
| *MACH Protocol Data* | | | Refer to MACH Protocol Specification |
| Message Type | 1 | Alphanumeric | "H" |
| Timestamp | 4 | NanoTime | Time at which this was generated by MIAX system. |
| Underlying Symbol | 11 | Alphanumeric | Underlying Symbol |
| Trading Status | 1 | Alphanumeric | "H" = MIAX has halted trading for this Underlying Symbol<br>"R" = MIAX will resume trading (reopen) for this Underlying Symbol<br>"O" = MIAX will open trading for this Underlying Symbol |
| Event Reason | 1 | Alphanumeric | "A" = This event resulted from automatic/market driven event<br>"M" = MIAX manually initiated this event |
| Expected Event Time: Seconds Part | 4 | SecTime | Seconds portion of the expected time of the event. Always use in conjunction with the Nano-seconds part field. |
| Expected Event Time: Nano-Seconds Part | 4 | BinaryU | Nano-seconds portion of the expected time of the event. Specifies number of nano-seconds since the seconds specified in "Expected Event Time Seconds" field. |

Points to note:

- When underlying trading status = "H", Expected Event Time Seconds/Nano-Seconds will be set to 0 (zero).
- When underlying trading status = "R" or "O", Expected Event Time (Seconds/Nano-Seconds Parts) will be set to the time at which the opening/reopening process will start for this Underlying Symbol.

## 4.5 Simple Order Message

This is the message format that will be used to disseminate MIAX Options Simple Orders.

MIAX Options Exchange
MIAX Order Feed (MOR) | Interface Specification
Document Version: 2.5b
Latest Revision Date: 05/17/2022

miax™

| Field Name | Length | Data Type | Notes |
|---|---|---|---|
| *MACH Protocol Data* | | | *Refer to MACH Protocol Specification* |
| Message Type | 1 | Alphanumeric | "F" |
| Timestamp | 4 | NanoTime | Time at which this was generated by MIAX system. |
| Action | 1 | Alphanumeric | Order Status. Valid Values: O = Open |
| Product ID | 4 | BinaryU | MIAX Product ID mapped to a given option. It is assigned per trading session and is valid for that session. |
| Order ID | 8 | BinaryU | MIAX assigned Order ID |
| Order Side | 1 | Alphanumeric | Side of order. Valid values: B = Buy S = Sell |
| Order Type | 1 | Alphanumeric | Order price type. Valid values: M = Market L = Limit |
| Order Price | 4 | BinaryPrc4U | Original limit price of the order. Zero for market orders. |
| Order Original Volume | 4 | BinaryU | Number of contracts specified on the order. |
| Remaining Volume Open | 4 | BinaryU | Number of contracts that are still open for trading at MIAX. |
| Time In Force (TIF) | 1 | Alphanumeric | Specifies how long the order remains in effect. Valid values: A = AOC (Auction or Cancel) G = GTC (Good Till Canceled) O = OPG (Opening transaction only or Cancel) D = DAY S = SAO (Settlement Auction Only) |
| Origin | 1 | Alphanumeric | Specifies the order origin type. Valid values:<br><br>0 = Priority Customer<br>1 = Firm<br>2 = Broker/Dealer<br>4 = Market Maker (MM)<br>5 = Non-Member Market Maker<br>8 = Non-Priority Customer<br>" " = Not Applicable (used for Derived Order) |
| Open/close indicator | 1 | Alphanumeric | Specifies if this order opens a position or closes a position. N/A when Origin is set to 4 = Market Maker or 5 = Non-Member Market Maker |

MIAX Options Exchange
MIAX Order Feed (MOR) | Interface Specification
Document Version: 2.5b
Latest Revision Date: 05/17/2022

miax™

| Field Name | Length | Data Type | Notes |
|---|---|---|---|
| | | | Valid values:<br>O = Open<br>C = Close<br>" " = Not Applicable |
| **Route instruction** | 1 | Alphanumeric | Route instruction that came with the order.<br>Valid values:<br>R = Routable<br>D = Do Not Route (DNR) |
| **Attributed ID** | 4 | Alphanumeric | MIAX assigned Attributable ID (Executing Broker MPID) of an Order. Otherwise, it is space filled. |
| **Priority Customer Volume** | 4 | BinaryU | Number of Priority Customer contracts, when Origin = " " (Derived Order) |
| **Reserved** | 28 | BinaryU | ** Reserved for future use ** |

Points to note:
- Order open size can increase, decrease or increase after going down to zero due to routing and reintroduction activities. It is also possible that such activities can result in identical messages being published occasionally.
- It is possible that an order may be closed and then reopened. Subscribers must be able to handle this.
- Only Open Simple Orders are disseminated using this message. A Simple Order Close state is disseminated using Order Close Message (Message Type = "x").
- Quotes and eQuotes will not be disseminated.
- Orders executed, rejected or canceled immediately upon receipt are not disseminated.
- Auction orders (eg: PRIME) and Immediate orders (eg: IOC, ISO) are not disseminated.
- AOC orders are only disseminated when they are targeted for Opening or Re-Opening.

## 4.6 Complex Strategy Definition Update

This is the message format that will be used to disseminate stock option strategies traded on MIAX for the current session. The Strategy ID sent in this message is utilized by the Administrative Information Subscriber (AIS) Feed for Complex Liquidity Seeking Events, the MIAX Order Feed (MOR) for Complex Order dissemination, the Complex Top of Market Feed (cToM) for Complex Trade and Top of Market dissemination and the MIAX Express Interface (MEI) for Complex eQuotes.

| Field Name | Length | Data Type | Notes |
|---|---|---|---|
| *MACH Protocol Data* | | | *Refer to MACH Protocol Specification* |
| **Message Type** | 1 | Alphanumeric | "C" |
| **Strategy Add Time** | 4 | NanoTime | Time at which this Strategy is added/updated on MIAX system today. |
| **Strategy ID** | 4 | BinaryU | MIAX Strategy ID is assigned per trading day and is valid only for that day. |
| **Underlying Symbol** | 11 | Alphanumeric | Underlying Symbol for this strategy |
| **Active on MIAX** | 1 | Alphanumeric | Indicates if this strategy is tradable on MIAX in the current session: |

| Field Name | Length | Data Type | Notes |
|---|---|---|---|
| | | | "A" = Active (tradable) on MIAX |
| | | | "I" = Inactive (not tradable) on MIAX |
| **Reserved** | 1 | BinaryU | ** Reserved for future use ** |
| **Update Reason** | 1 | Alphanumeric | "N" – New strategy created |
| | | | "U" – Strategy definition Updated |
| **Reserved** | 10 | BinaryU | ** Reserved for future use ** |
| **Number of Legs** | 1 | BinaryU | Number of Legs.  Variable from 2 to 8 |
| ➡ Product ID | 4 | BinaryU | *Option leg:*<br>MIAX Defined Series.  See Simple Series Update Message.<br>*Stock leg:*<br>0 (zero) |
| ➡ Leg Ratio Qty | 2 | BinaryU | The ratio of this individual leg.<br>Number of option contracts or Number of stock shares for this leg is:<br>LegRatioQty * OrderQty |
| ➡ Leg Side | 1 | Alphanumeric | The side of this individual leg<br>Valid values are:<br>"B" = Bid<br>"A" = Ask |
| ➡ Reserved | 8 | BinaryU | ** Reserved for future use ** |

Points to note:
- Strategies may be created intra-day as orders are placed at the MIAX Exchange or pre-defined before the market open.
- In each channel, firms will only receive the Strategies associated with the Engine that is servicing that channel.
- In case of an intra-day reconnection, users can request all Strategies definitions from the AIS of MOR retransmission lines.
- The length of this message is ***variable*** based on the number of legs.
- When underlying halts, all strategies for that underlying are in a halted state.  Firms should process Underlying Trading Status notification to determine current state of the strategies.
- This message might be published more than once per day.  When Update Reason is "U", the only field that can change is "Active on MIAX".
- The tradability of a strategy can be tracked with the status of the underlying (message type "H") or the individual series. (message type "P")
- The Strategy ID and Product ID fields are separate and distinct fields with assigned ID's per trading day and valid only for the current day. Their scope is limited to each field.

## 4.7 Complex Order Message

This is the message format that will be used to disseminate MIAX Options Complex Orders.

MIAX Options Exchange
MIAX Order Feed (MOR) | Interface Specification
Document Version: 2.5b
Latest Revision Date: 05/17/2022

miax™

| Field Name | Length | Data Type | Notes |
|---|---|---|---|
| *MACH Protocol Data* | | | *Refer to MACH Protocol Specification* |
| Message Type | 1 | Alphanumeric | "R" |
| Timestamp | 4 | NanoTime | Time at which this was generated by MIAX system. |
| Action | 1 | Alphanumeric | Order Status.<br>Valid Values:<br>O = Open |
| Strategy ID | 4 | BinaryU | MIAX Strategy ID as specified in Strategy Update message.<br>ID is assigned per trading session and is valid for that session. |
| Order ID | 8 | BinaryU | MIAX assigned Order ID |
| Order Side | 1 | Alphanumeric | Side of order.<br>Valid values:<br>B = Buy<br>S = Sell |
| Order Type | 1 | Alphanumeric | Order price type.<br>Valid values:<br>M = Market<br>L = Limit |
| Order Price | 8 | BinaryPrc4S | Effective limit price of the order (see notes). Not applicable for Market Orders.<br>If Side is "B":<br>• Positive number represents net debit<br>• Negative number represents net credit<br>If Side is "S":<br>• Positive number represents net credit<br>• Negative number represents net debit<br>Price of Zero is net neutral for either side |
| Order Original Volume | 4 | BinaryU | Number of strategies specified on the order. |
| Remaining Volume Open | 4 | BinaryU | Number of strategies that are still open for trading at MIAX. |
| Time In Force (TIF) | 1 | Alphanumeric | Specifies how long the order remains in effect.<br>Valid values:<br>G = GTC (Good Till Canceled)<br>D = DAY |
| Origin | 1 | Alphanumeric | Specifies the order origin type.<br>Valid values:<br>0 = Priority Customer<br>1 = Firm<br>2 = Broker/Dealer<br>4 = Market Maker (MM)<br>5 = Non-Member Market Maker<br>8 = Non-Priority Customer |

| Field Name | Length | Data Type | Notes |
|---|---|---|---|
| Attributed ID | 4 | Alphanumeric | MIAX assigned Attributable ID (Executing Broker MPID) of an Order.  Otherwise, it is space filled. |
| Reserved | 28 | BinaryU | ** Reserved for future use ** |

Points to note:
- Order open size can increase, decrease or increase after going down to zero.
- It is possible that an order may be closed and then reopened.  Subscribers must be able to handle this.
- Only Open Complex Orders are disseminated using this message. A Complex Order Close state is disseminated using Order Close Message (Message Type = "x").
- Orders fully executed, rejected or canceled immediately upon receipt are not disseminated.
- Auction or Cancel (AOC) orders and Immediate orders (eg: IOC) are not disseminated.
- Complex crossing orders (cPRIME, cC2C, cQCC) are not disseminated
- Effective limit price is the less aggressive of the original price or the original protected price.

## 4.8 Order Close Message

This is the message format that will be used to disseminate Order Close for MIAX Options Simple and Complex Orders.

| Field Name | Length | Data Type | Notes |
|---|---|---|---|
| *MACH Protocol Data* | | | Refer to MACH Protocol Specification |
| Message Type | 1 | Alphanumeric | "x" |
| Timestamp | 4 | NanoTime | Time at which this was generated by MIAX system. |
| Simple or Complex Order | 1 | Alphanumeric | "F" – Simple Order<br>"R" – Complex Order |
| Order ID | 8 | BinaryU | MIAX assigned Order ID |

Points to note:
- Order Close Message is disseminated for a fill or a cancel.
- Order ID is unique across all MIAX Options Orders and can be used to uniquely identify a Simple or a Complex Order.

# Appendix A: MIAX MOR Subscription/Connectivity Information

Please visit MIAX website at http://www.MIAXOptions.com to obtain the most up-to-date information about the following:

- Real-time Feed multicast groups, ports for A feed and B Feed
- Retransmission IP addresses and ports for primary and backup channels.

# Appendix B: Contact List

Please visit MIAX website at http://www.MIAXOptions.com to obtain the most up-to-date contact list and other such information.

# Appendix C: Revision History

| Revision Date | Version | Description |
| --- | --- | --- |
| Feb 24, 2015 | 1.0 | First release. |
| Jun 29, 2015 | 1.1 | MOR Refresh feature |
| Jan 15, 2016 | 1.2 | Underlying Market Code: Added 'V' for IEX in Series Update message |
| Feb 01, 2016 | 2.0 | Complex Orders<br>Added messages:<br>"Complex Strategy Definition Update" and<br>"Complex Order Message" |
| Apr 12, 2016 | 2.0a | Updated field MOR Version in the System State message |
| Jun 24, 2016 | 2.1 | Complex Order Message – Removed value "4 = Market Maker" from Origin field. |
| Nov 30, 2016 | 2.1a | Complex Order Message – Added value "4 = Market Maker (MM)" for Origin field |
| Feb 27, 2017 | 2.1b | System startup time moved up |
| Apr 03, 2017 | 2.1c | Complex Order Message: Added a note that Complex crossing orders are not disseminated<br>Wrong packet length notes removed from Last value Refresh Service request. |
| Jul 26, 2017 | 2.2 | Simple Order Message: Removed Action = C (Close) from the message. Added Origin = " " (Not Applicable) for Derived Order. Used 4 bytes of the 32 reserved bytes for the new field "Priority Customer Volume"<br>Complex Order Message: Removed Action = C (Close) from the message.<br>Added a new message, Order Close Message (Message Type = "x") |
| Mar 16, 2018 | 2.3 | Updated Complex Strategy Definition message (Message Type = "C") to support stock-tied strategy definitions |
| May 08, 2018 | 2.4 | Simple Order Message: Added SAO orders |
| Aug 12, 2020 | 2.4a | Added new Equities exchanges |
| Sep 15, 2020 | 2.5 | Field added in Complex Order Message to indicate Attributable for complex orders |
| Oct 01, 2021 | 2.5a | Limit price clarification for Simple and Complex Orders due to protections |
| May 17, 2022 | 2.5b | Removal of FOK OrderType |

**miax**™

**miaxoptions.com**