MIAX Futures Onyx

Depth of Market Feed
DoM Interface Specification

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1 Overview

MIAX Futures Onyx Depth of Market Feed (**DoM**) is a data feed that allows subscribers to receive real-time updates of the following information from the MIAX Futures Exchange:

- Outright (Simple) and Complex Instrument Definitions
- Available orders on MIAX Futures Exchange book: Limit Price and Size of orders are disseminated
- Order executions (trades) and Trade Cancellations
- Trading Status of Instruments traded on MIAX Futures Exchange
- Anticipated Opening Price, Settlement Price, Open Interest & Total Volume
- MIAX Futures Exchange System Status

DoM Features:

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

- DoM uses binary message format, binary numeric fields and fixed length ASCII fields in messages in order to utilize bandwidth efficiently and assist in achieving **low latency**.
- Message formats are designed to use **less bandwidth**. For example: DoM messages use Instrument IDs in each message in place of a full canonical symbol.
- DoM 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.
- DoM real-time messages are disseminated over multicast to achieve a fair delivery mechanism. DoM 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 DoM retransmission service also provides a **Last Value Refresh Service** to facilitate fast intra-day recovery without a full day gap fill.
- DoM notifications provide current **system status** allowing the subscribers to take necessary actions immediately.

This specification is intended to be used by MIAX Futures Exchange DoM subscribers only.

1.1 Exchange related information

1.1.1 Hours of operation for MIAX Futures Onyx

Please visit to the MIAX Website for details about times for each of these periods.

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

5:40 pm ET	**End of Recycle Window**
	Firms will get the instrument data on multicast channels or can connect and download on retransmission channels.
5:45 pm ET	**Live Order Window (LOW)**
	Start of acceptance of messages (including Orders). Orders received at or after this time can be accepted by MIAX Futures Onyx.
5:05 pm ET	**Beginning of Recycle Window** (begins at 2:05 pm ET on early closing days)
	DoM has completed sending all messages.

Please refer to the MIAX Website for details about times for each of these events/periods as well as Product specific trading schedules.

MIAX Futures Onyx may send trade related data following the end of trading session due to the issuance of manual trades, trade cancels or trade corrections for various operational reasons as needed.

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 MIAXFuturesTradingOperations@MIAXGlobal.com or by referring to the MIAX website.

1.2   Testing of DoM Subscription

MIAX Futures Onyx can provide testing assistance on the MIAX Futures Onyx testing area for the DoM Feed and the DoM retransmission interface.

Please contact MIAX Trading Operations at MIAXFuturesTradingOperations@MIAXGlobal.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 DoM.

Instrument Definitions: Subscribers to the data feed will get a list of all Instruments that will be traded and sourced on that feed at the start of every Trading Day and upon creation of any Complex Instruments during the Trading Day. If firms cannot start listening to the feed in time for the normal Instrument broadcast, they can connect to the DoM Retransmission service and request for a Last Value Refresh Service (see Section 3.2.2) or request all messages published and then subsequently process only the Instrument messages to build their Instrument list. The MIAX Futures Onyx assigned Instrument ID of each instrument will be sent in every message so that firms can tie each message to an Instrument ID.

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 Futures Onyx offers the real-time DoM 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 DoM feed.

Business Trade Date: Business Trade Date refers to the calendar date on which a Trading Day ends, and is typically the calendar date after it begins. For example: A Business Trade Date of Monday 10/28/2024 begins on Sunday 10/27/2024 and ends on Monday 10/28/2024.

Trade ID: Simple Trade IDs and Complex Trade IDs are not unique between Simple and Complex executions.
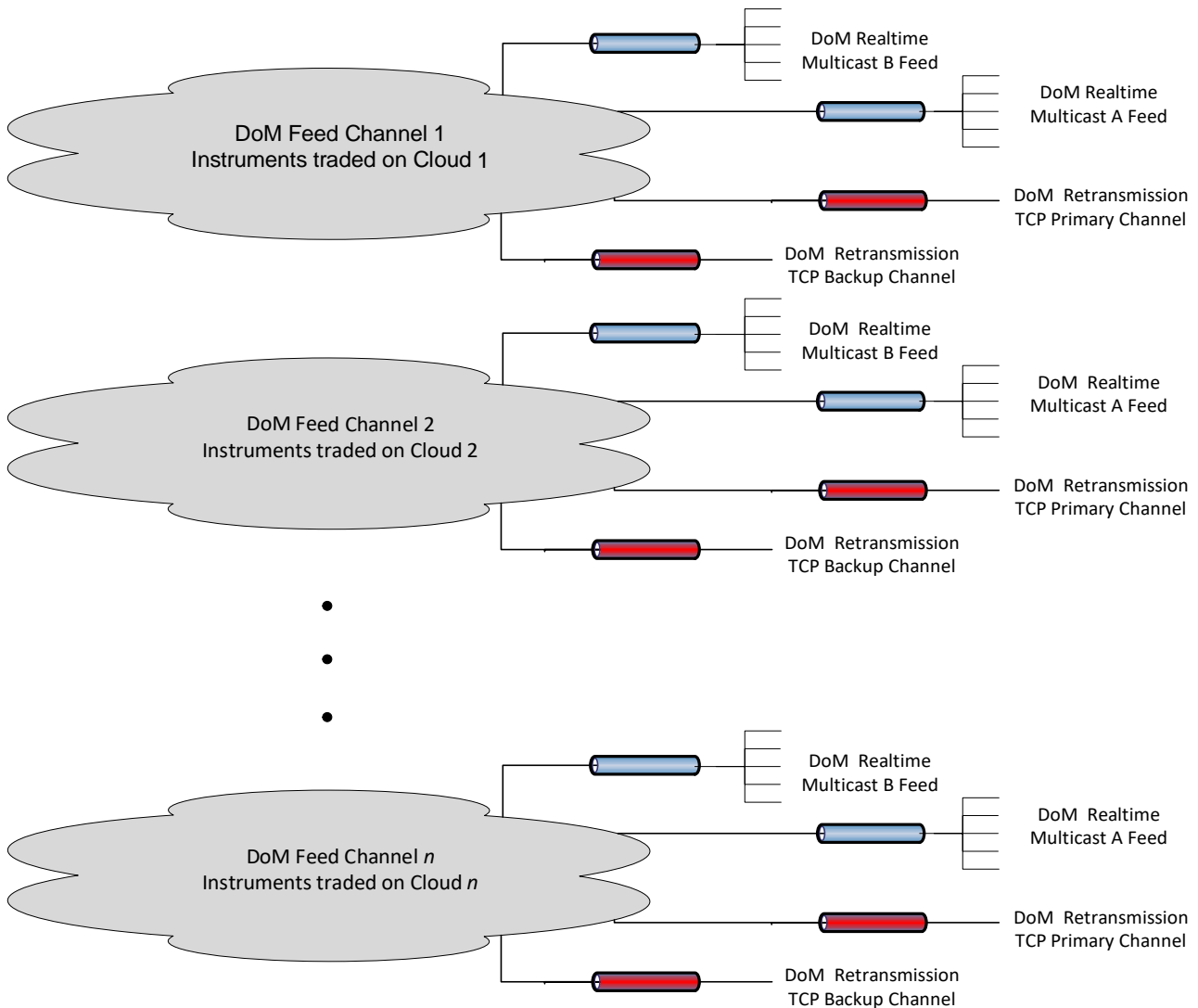
1.4 Data Types

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

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

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
Price9S	BinaryS Field with the last 9 (right most) digit places being decimal places. $-1.00 is represented as -1,000,000,000
Flags	A special BinaryU type where a bit mask must be used to extract different values. The least significant bit is bit 0.
NanoTime	BinaryU field that contains the Matching Engine transaction time in nanoseconds since UNIX Epoch, 1970-01-01 00:00:00 +0000 (**UTC**)
Date	BinaryU field that contains number of days since the UNIX Epoch, 1970-01-01 00:00:00 +0000 (**UTC**). This field describes the Business Trade Date.
Alphanumeric	Each place can contain characters or numbers. Left justified and space-padded on the right
String	Characters in ASCII range 33-126 are allowed, except for pipe. If less than the maximum field size, must be null terminated for all the remaining bytes of the field

2 DoM Architecture

Depth of Market Feed (DoM) Architecture

DoM Feed Channel 1
Instruments traded on Cloud 1

DoM Realtime Multicast B Feed

DoM Realtime Multicast A Feed

DoM Retransmission TCP Primary Channel

DoM Retransmission TCP Backup Channel

DoM Feed Channel 2
Instruments traded on Cloud 2

DoM Realtime Multicast B Feed

DoM Realtime Multicast A Feed

DoM Retransmission TCP Primary Channel

DoM Retransmission TCP Backup Channel

DoM Feed Channel *n*
Instruments traded on Cloud *n*

DoM Realtime Multicast B Feed

DoM Realtime Multicast A Feed

DoM Retransmission TCP Primary Channel

DoM Retransmission TCP Backup Channel

Highlights:

- Real-time dissemination is separated out on to *n* separate Feed channels.
- A Feed channel will contain sourced data for a discrete set of Instruments.
- A discrete set of Instruments 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
- Instruments may not be contiguously distributed according to Instrument ranges in each Feed channel.
- Two separate TCP based retransmission channels for each Feed channel supply DoM retransmission via the DoM Retransmission interface.

3 Session Level Protocol

3.1 Real-time DoM Feed

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

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

3.2 DoM Retransmission Interface

DoM 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 SesM Gap Fill Service or 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 Futures Onyx

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	'I' – Simple/Complex Instrument Definition Refresh 'T' – Instrument Trading Status Refresh 'S' – System State Refresh 'O' – Order Book Refresh

3.2.2.2 Response Message from MIAX Futures Onyx

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	See notes below.
Application Message	Varies	See section 0	Based on the message type requested.

Points to note:
- The timestamp represents the most recent MIAX Futures Onyx Matching Engine transaction time. It is **not** the original timestamp from the MACH sequenced messages in the live feed.
- When Refresh Message Type in the request is 'S', 'T' or 'I', the sequence number in the refresh messages is the original sequence number from live feed. This sequence number may be used to arbitrate with the sequenced packets from live feed (e.g.: data with higher sequence number from either the refresh or the live feed represents latest information).
- When Refresh Message Type in the request is 'O' – Order Book Refresh, the sequence number in the refresh messages will be the same, which will be the last sequence number on the live feed at the time of the refresh request. The refresh will include the following messages in order *as of the time of refresh request.* The timestamp in all the refresh messages will be the most recent MIAX Futures Onyx Matching Engine transaction time *as of time of refresh request*
    - Latest System State message
    - For each Simple Instrument
        - Latest Simple Instrument Definition message
        - Latest Instrument Trading Status Notification message
    - For each Complex Instrument,

- Latest Complex Instrument Definition message
- Latest Instrument Trading Status Notification message
  o All Add Order messages necessary to build the book for each Instrument

3.2.2.3 End of Refresh Notification from MIAX Futures Onyx

When the refresh is complete MIAX Futures Onyx 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, DoM Retransmission Interface will send a `Goodbye Packet` and disconnect the TCP connection.

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

4 Application Message Formats

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

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

4.1   Simple Instrument Definition

This is the message format that will be used to disseminate all Simple Instruments traded on MIAX Futures Onyx for the current trading session. The Instrument ID sent in this message will be disseminated in all Depth of Market messages.

Field Name	Length	Data Type	Notes
MACH Protocol Data			*Refer to MACH Protocol Specification*
Message Type	1	BinaryU	1
Timestamp	8	NanoTime	Matching Engine time.
Instrument ID	4	BinaryU	Unique ID assigned by MIAX Futures Onyx for a Simple instrument and is permanent for the life of a Simple instrument.
Underlying Asset Type	1	Alphanumeric	Underlying Asset Type of this instrument: 'E' = Equity Index 'A' = Commodity/Agriculture
Underlying Asset	4	Alphanumeric	Underlying Asset Code. e.g.: MW for Hard Red Spring Wheat.
Product Group Code	6	Alphanumeric	Product Group Code: e.g.: MWE for Hard Red Spring Wheat Standard Deliverable (5000 Bushels)
Exchange	4	Alphanumeric	"XMGE" - MIAX Futures Exchange
Instrument ID Source	1	Alphanumeric	Indicates whether the Instrument ID has been assigned by the exchange or from an external industry source 'E' = Exchange
Instrument Type	1	Alphanumeric	'F' = Futures
Maturity Month-Year	4	BinaryU	Maturity Month-Year is the expiration date of a Simple Instrument - YYYYMM
Currency	1	Alphanumeric	The currency in which all Futures Instruments of the Futures Product will trade 'U' = USD
Settlement Currency	1	Alphanumeric	The Currency in which the Product settles 'U' = USD

Match Algorithm	1	Alphanumeric	The allocation model used by the MIAX Futures Onyx Trading Platform for the Product 'P' = Price/Time
Minimum Size	4	BinaryU	Minimum Order Size
Maximum Size	4	BinaryU	Maximum Order Size
Tick	8	Price9S	Order Entry Price Tick of the Product
Unit of Measure	5	Alphanumeric	Individual unit of the Deliverable of the Underlying Asset associated with the Futures Contract 'BU' = Bushels 'USD' = USD
Unit of Measure Quantity	4	BinaryU	The quantity of the Underlying Asset that is required for the Deliverable associated with the Futures Contract
Settlement Price	8	Price9S	The previous day's Settlement Price
Settlement Price Type – Calc Method	1	Alphanumeric	Actual or Theoretical Settlement Price Indicator 'A' = Actual 'T' = Theoretical
Total Volume	4	BinaryU	The aggregate amount of volume that has traded from the prior Trading Day
Open Interest Quantity	4	BinaryU	The amount of aggregate open contracts in a Simple Instrument
High Limit Price	8	Price9S	The Upper Band of the Daily Trading Limit of a Futures Product
Low Limit Price	8	Price9S	The Lower Band of the Daily Trading Limit of a Futures Product
Trading Collar Variation Type	1	Alphanumeric	'D' = Product Dollar Collar Value 'P' = Product Collar Percentage Value
Trading Collar Variation	8	Price9S	The Dollar Value or Percentage Value used in the calculation of the Trading Collar
Reserved	16	BinaryU	Reserved for future use

Points to note:
- Entire Instrument list for the channel will be disseminated at the start of day.
- In each channel, firms will only receive the Instruments associated with the Matching 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 Instruments data from the DoM retransmission line.
- Open Interest provided in the Simple Instrument Definition will be T-2

4.2 Complex Instrument Definition

This is the message format that will be used to disseminate all Complex Instruments traded on MIAX Futures Onyx for the current trading session. The Strategy ID sent in this message will be disseminated in all Depth of Market messages.

Field Name	Length	Data Type	Notes
MACH Protocol Data			*Refer to MACH Protocol Specification*
Message Type	1	BinaryU	2
Timestamp	8	NanoTime	Matching Engine time.
Strategy ID	4	BinaryU	Unique ID assigned by MIAX Futures Onyx for a Complex instrument and is permanent for the life of an instrument.
Underlying Asset Type	1	Alphanumeric	Underlying Asset Type of this instrument: 'E' = Equity Index 'A' = Commodity/Agriculture
Underlying Asset	4	Alphanumeric	Underlying Asset Code. e.g.: MW for Red Spring Wheat.
Product Group Code	6	Alphanumeric	Product Group Code: e.g.: MWE for Hard Red Spring Wheat Standard Deliverable (5000 Bushels)
Spread Type	1	Alphanumeric	Spread Type 'S' = Standard Calendar Spread 'E' = Equity Calendar Spread 'B' = Butterfly Spread
Exchange	4	Alphanumeric	"XMGE" - MIAX Futures Exchange
Instrument ID Source	1	Alphanumeric	Indicates whether the Instrument ID has been assigned by the exchange or from an external industry source 'E' = Exchange
Instrument Type	1	Alphanumeric	'F' = Futures
Currency	1	Alphanumeric	The currency in which all Futures Instruments of the Futures Product will trade 'U' = USD
Settlement Currency	1	Alphanumeric	The Currency in which the Product settles 'U' = USD
Match Algorithm	1	Alphanumeric	The allocation model used by the MIAX Futures Onyx Trading Platform for the Product 'P' = Price/Time
Minimum Size	4	BinaryU	Minimum Order Size
Maximum Size	4	BinaryU	Maximum Order Size
Tick	8	Price9S	Order Entry Price (Tick) of the Product
Unit of Measure	5	Alphanumeric	Individual unit of the Deliverable of the Underlying Asset associated with the Futures Contract 'BU' = Bushels 'USD' = USD

Unit of Measure Quantity	4	BinaryU	The quantity of the Underlying Asset that is required for the Deliverable associated with the Futures Contract
Trading Collar Variation Type	1	Alphanumeric	'D' = Product Dollar Collar Value 'P' = Product Collar Percentage Value
Trading Collar Variation	8	Price9S	The Dollar Value or Percentage Value used in the calculation of the Trading Collar
Reserved	16	BinaryU	Reserved for future use
Number of Legs	1	BinaryU	Number of strategy legs. The fields below (marked with →) are repeated for each specified leg
→ Instrument ID	4	BinaryU	Instrument ID for the leg
→ Leg Ratio and Side	4	BinaryS	Leg ratio for the specified instrument Positive indicates Buy Negative indicates Sell
→ Maturity Month-Year	4	BinaryU	Maturity Month-Year is the expiration date of a Simple Instrument - YYYYMM
→ Reserved	8	BinaryU	Reserved for future use

Points to note:
- Entire Complex Instrument list for the channel will be disseminated at the start of day. Intra-day updates will also be published as they occur. In each channel, firms will only receive the Instruments associated with the Matching Engine that is servicing that channel.
- In case of an intra-day reconnection, users can request all Instruments data from the DoM retransmission line.

4.3 System State

This is the message format that will be used to notify firms of the state changes of the system. This is a notification that applies to all Instruments on the feed. 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	BinaryU	3
Timestamp	8	NanoTime	Matching Engine time.
DoM Version	8	Alphanumeric	e.g.: DoM1.0
Session ID	1	BinaryU	Current trading session identifier.
System Status	1	Alphanumeric	'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 DoM 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 a restart at MACH sequence number 1 for all Instrument groups. 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 Instrument Trading Status Notification

This message is used to notify firms of changes to the trading status of a particular Simple or Complex instrument.

Field Name	Length	Data Type	Notes
MACH Protocol Data			*Refer to MACH Protocol Specification*
Message Type	1	BinaryU	4
Timestamp	8	NanoTime	Matching Engine time.
Instrument ID	4	BinaryU	Instrument ID mapped to a given Simple or Complex Instrument.
Trading Status	1	BinaryU	1 - Pre-Open 2 - Opening Freeze 3 - Trading 4 - Halt 5 - Operational Halt 6 - Closed
Market State	1	BinaryU	1 - Pre-Opening 2 - Extended 1 Trading Session 3 - Regular Trading Session 4 - Extended 2 Trading Session

4.5 Anticipated Opening Price

This message format is used to publish Anticipated Opening Price Messages for each Simple Instrument and Complex Instrument before the start of trading.

Field Name	Length	Data Type	Notes
MACH Protocol Data			*Refer to MACH Protocol Specification*
Message Type	1	BinaryU	5
Timestamp	8	NanoTime	Matching Engine time.
Instrument ID	4	BinaryU	Instrument ID mapped to a given Simple or Complex Instrument.
Anticipated Opening Price	8	Price9S	Anticipated Opening Price
Opening Match Quantity	4	BinaryU	Opening Matched Quantity

Points to note:
- This update will be sent for Simple instruments and for Complex instruments.
- When there is no Anticipated Opening Price, the Anticipated Opening Price will be represented as 999,999,999.999999999 and the Opening Match Quantity will be represented as 0.

4.6   Settlement Price Update

This message format is used to publish a Settlement Price Update and will be disseminated for each Simple Instrument as the Settlement Price is calculated for the Futures Instrument.

Field Name	Length	Data Type	Notes
MACH Protocol Data			*Refer to MACH Protocol Specification*
Message Type	1	BinaryU	6
Timestamp	8	NanoTime	Matching Engine time.
Trade Date	2	Date	Trade Date
Instrument ID	4	BinaryU	Instrument ID mapped to a given Simple Instrument.
Settlement Price	8	Price9S	Settlement Price
Settlement Price Type	1	Alphanumeric	Daily or Final Settlement Price Indicator 'D' = Daily 'F' = Final
Settlement Price Type – Calc Method	1	Alphanumeric	Actual or Theoretical Settlement Price Indicator 'A' = Actual 'T' = Theoretical

Points to note:
- This update will be sent only for Simple Instruments and not for Complex Instruments.

4.7   Open Interest Update

This message format is used to publish an Open Interest Update for each Simple Instrument once after the end of the last Trading Session.

Field Name	Length	Data Type	Notes
MACH Protocol Data			*Refer to MACH Protocol Specification*
Message Type	1	BinaryU	7
Timestamp	8	NanoTime	Matching Engine time.
Trade Date	2	Date	Trade Date
Instrument ID	4	BinaryU	Instrument ID mapped to a given Simple Instrument.
Open Interest Quantity	4	BinaryU	The amount of aggregate open contracts in a Simple Instrument

Points to note:
- This update will be sent only for Simple Instruments and not for Complex Instruments.

4.8 Total Volume Update

This message format is used to publish a Total Volume Update for each Simple Instrument at the end of the last Trading Session.

Field Name	Length	Data Type	Notes
MACH Protocol Data			*Refer to MACH Protocol Specification*
Message Type	1	BinaryU	8
Timestamp	8	NanoTime	Matching Engine time.
Trade Date	2	Date	Trade Date
Instrument ID	4	BinaryU	Instrument ID mapped to a given Simple Instrument.
Total Volume	4	BinaryU	The aggregate amount of volume that has traded in a Simple Futures Instrument from the prior trading day

Points to note:
- This update will be sent only for Simple Instruments and not for Complex Instruments.

4.9 Instrument Clear Message

This message format is used to indicate that the MIAX Futures Onyx book for a Simple or Complex instrument has been cleared of all orders.

Field Name	Length	Data Type	Notes
MACH Protocol Data			*Refer to MACH Protocol Specification*
Message Type	1	BinaryU	9
Timestamp	8	NanoTime	Matching Engine time.
Instrument ID	4	BinaryU	Instrument ID mapped to a given Simple or Complex Instrument.

Points to note:
- This message will be sent anytime when MIAX Futures Onyx book is cleared of all orders including at startup each day and on Matching Engine recovery for all affected Instruments

4.10 Add Order Message

This is the message format that will be used when an order is added to the MIAX Futures Onyx book. It includes an Order ID that is unique to the order across the exchange and across trading days.

Field Name	Length	Data Type	Notes
MACH Protocol Data			*Refer to MACH Protocol Specification*
Message Type	1	BinaryU	10
Timestamp	8	NanoTime	Matching Engine time.
Instrument ID	4	BinaryU	Instrument ID mapped to a given Simple or Complex Instrument.

Field Name	Length	Data Type	Notes
Order Type	1	Alphanumeric	Order type. 'S' = Simple Order 'C' = Complex Order 'D' = Derived Order
Order ID	8	BinaryU	Matching engine assigned Order ID.
Order Side	1	Alphanumeric	Side of order. Valid values: B = Buy S = Sell
Price	8	Price9S	Order price. Can be positive, negative or zero.
Size	4	BinaryU	Open order size.

Points to note:
- If an order's size on the book is reduced to zero, other than by a trade, a Delete Order message will be published.
- Orders fully executed, rejected or canceled immediately upon receipt are not disseminated.
- Order Add Messages will not be sent for Stop Limit Orders unless the order is triggered/introduced and posted to the order book.
- Order Add Messages will not be sent for Stop Market Orders even at introduction as they will never be posted to the order book.

4.11 Modify Order Message

This message format is used to publish price/size changes for an existing order on the MIAX Futures Onyx book.

Field Name	Length	Data Type	Notes
MACH Protocol Data			*Refer to MACH Protocol Specification*
Message Type	1	BinaryU	11
Timestamp	8	NanoTime	Matching Engine time.
Instrument ID	4	BinaryU	Instrument ID mapped to a given Simple or Complex Instrument.
Order ID	8	BinaryU	Provided in the Add Order message.
Price	8	Price9S	Order price after this modify. Can be positive, negative or zero.
Size	4	BinaryU	Open order size after this modify.
Flags	1	Flags	**Bit 0: Order Position** 0 – Order kept its position in the book 1 – Order lost its position in the book **Bits 1-7:** undefined

4.12 Delete Order Message

This message format is used to indicate that an order has been removed from the MIAX Futures Onyx book.

Field Name	Length	Data Type	Notes
MACH Protocol Data			*Refer to MACH Protocol Specification*
Message Type	1	BinaryU	12
Timestamp	8	NanoTime	Matching Engine time.
Instrument ID	4	BinaryU	Instrument ID mapped to a given Simple or Complex Instrument.
Order ID	8	BinaryU	Provided in the Add Order message.

4.13 Order Execution Message

This message format is used when a Simple or Complex order on the book executes in whole or in part. The execution is identified by a unique Trade ID that is unique across the exchange for the trading day. Subsequent partial executions of the order would be published with the same Order ID but different Trade ID. Trade Corrections are published using this message for Simple Instruments only.

Field Name	Length	Data Type	Notes
MACH Protocol Data			*Refer to MACH Protocol Specification*
Message Type	1	BinaryU	13
Timestamp	8	NanoTime	Matching Engine time.

Field Name	Length	Data Type	Notes
Trade Date	2	Date	Business Trade Date
Instrument ID	4	BinaryU	Instrument ID mapped to a given Simple or Complex Instrument.
Buy Order ID	8	BinaryU	Provided in the Add Order message. 0 if Order has not rested on the Book.
Sell Order ID	8	BinaryU	Provided in the Add Order message. 0 if Order has not rested on the Book.
Aggressor Side	1	Alphanumeric	Side of the trade that was the Aggressor: 'B' = Buy Side 'S' = Sell Side 'N' = Not Applicable
Trade ID	8	BinaryU	Unique ID assigned by the Matching Engine.
Correction Number	1	BinaryU	Trade correction number. Set to zero for new trades. Increments by 1 for each subsequent correction.
Price	8	Price9S	Execution price.
Size	4	BinaryU	Number of Futures contracts executed.

Points to note:
- Trade ID assigned to a trade execution will be used in subsequent Trade Cancel message if the trade is canceled.
- If the execution is corrected, trade corrections are published with the same Trade ID as the original execution.
  - If a new or corrected trade was manually entered, both Buy Order ID and Sell Order ID will be set to 0 and the Aggressor Side will be set to 'N'.
- For clients maintaining an order book, the order size is reduced by the executed size. If a trade execution is reported by the Order Execution message, there will be no other message to indicate this order size reduction.
- Trade corrections will have the same Trade ID as the original trade; the Correction Number will be incremented for each subsequent correction.
- Trade Corrections will not be sent for Complex trades.
- A complete view of all MIAX Futures Onyx executions can be built by using the Order Execution Messages and Trade Cancel Messages.
- Aggressor Side will be set to Not Applicable for trades that take place as part of the Opening Process.
- For Complex trades that take place via legging, only the individual leg executions will be reported.

4.14 Trade Cancel Message

This message format is used to publish cancellation of a Simple Instrument trade which was previously published via an Order Execution Message.

Field Name	Length	Data Type	Notes
MACH Protocol Data			*Refer to MACH Protocol Specification*

Field Name	Length	Data Type	Notes
Message Type	1	BinaryU	14
Timestamp	8	NanoTime	Matching Engine time.
Trade Date	2	Date	Business Trade Date
Instrument ID	4	BinaryU	Instrument ID mapped to a given Simple Instrument.
Trade ID	8	BinaryU	Provided in the Order Execution Message.
Correction Number	1	BinaryU	The latest correction number of the given Trade ID.
Price	8	Price9S	The latest price of the given Trade ID.
Size	4	BinaryU	The latest size of the given Trade ID.

Points to note:
- Trade Cancel messages do not alter the book and can be ignored by recipients which are not building a book.
- Trade Cancels will not be sent for Complex trades.

Appendix A: DoM Subscription/Connectivity Information

Please visit the MIAX Website 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 the MIAX Website for obtaining the most up-to-date contact list and other such information.

Appendix C: Revision History

Revision Date	Version	Description
10/31/2024	1.0	Initial release.
1/10/2025	1.0a	No changes to message structures Corrected values for Unit of Measure Added clarification on Order Execution message for corrections to a manually entered trade Added clarification to notes in section 4.3

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