



**Options FIX Drop  
using FIX Protocol**

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**FIX Drop Specification**

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# 1 Overview

The MIAX FIX Drop (**FXD**) is a messaging interface that provides real-time trade information corresponding to a firm's orders.

FXD uses FIX protocol version 4.2 (with minor customization) for both application messages and session level messages. For detailed information regarding FIX protocol and session protocol, please refer to the FIX documentation provided by FIX Protocol Limited (FPL) on their website <http://www.fixprotocol.org>.

This specification is intended to only be used by MIAX member firms and the firms that are sponsored for MIAX access by MIAX member firms.

## 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 as per timings of United States Eastern Time zone.

|                       |   |
|-----------------------|---|
| 7:30 am               | Firm Interface Start up time<br>Firms are allowed to connect  |
| 9:30 am to<br>4:00 pm | <b>Trading Session for Equity Options</b> (ends at 1:00 pm on early closing days)<br>Note that MIAX may still send queued executions even after the end of this time range        |
| 9:30 am to<br>4:15 pm | <b>Trading Session for ETF and Index Options</b> (ends at 1:15 pm on early closing days)<br>Note that MIAX may still send queued executions even after the end of this time range |
| 5 pm<br>(approx)      | <b>End of Session</b> (ends at 2 pm on early closing days)<br>FIX Drop has completed sending all messages and Firms will soon be disconnected                                     |

### 1.1.2 Obtaining more information

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

## 1.2 Certification for the FIX Drop

MIAX will provide a test area for member firm's testing and certification needs. Please contact MIAX Trading Operations to obtain more information about this environment.

In order to connect to MIAX production, member firms must certify their application with MIAX. This certification testing is a manual process. In order to schedule a certification test, please email Trading Operations.

### 1.3 FAQs

***Executions/Busts/Adjustments:*** All partially filled, filled executions, trade cancels (busts) and corrections (adjustments) are conveyed to firms via FIX Drop. Order acknowledges, rejects, cancels and replaces are not conveyed to firms via FIX Drop.

***Multiple FXDs:*** In the event a firm needs multiple FXDs sending executions for the same MPIDs, the order of executions received on one FXD can be different than that of another FXD. Firms are recommended to arbitrate using execution report information and not FIX sequence numbers.

***Failure/Recovery:*** In the event of a catastrophic hardware problem servicing FIX Drop, MIAX will activate backup FIX Drop services on alternative hardware with different IP addresses. Other than a change in IP address, the FIX session can be reestablished just as after a normal disconnect and resynchronized per normal FIX protocol. Note that selected outbound messages, from MIAX to the Firm, in transition during the failure, may be sent **or resent** with PossResend=Y. Firms may have already seen some of these messages before, with lower sequence numbers, and should handle the possible duplicate communications

Note that the backup FIX Drop Copies are not available for connectivity testing during the trading day.

Firms are encouraged to conduct failover testing to ensure seamless interaction during such events.

### 1.4 Configuration

Firms can configure their session(s) with the below properties.

***Comp ID:*** All messages sent in either direction must contain SenderCompID and TargetCompID. Firms and MIAX will agree upon the values, to be used for these fields, at the time of initial setup. Firms are allowed to use a single *Comp ID* for each connection. MIAX will allow connections from a preconfigured computer (CompID).

| Firm to MIAX |              | MIAX to Firm |              |
|--------------|--------------|--------------|--------------|
| SenderCompID | TargetCompID | SenderCompID | TargetCompID |
| Firm Comp ID | MIAX         | MIAX         | Firm Comp ID |

***TargetSubID:*** The TargetSubID in the execution reports contain the SenderSubID from a firm's order entry.

***IP Address:*** At the time of setup, MIAX will require Firms source IPs and will allocate one or more MIAX FIX Drop server IPs to your firm as agreed upon by the Firm and MIAX membership.

***Port:*** At the time of setup, MIAX will allocate one or more MIAX FIX Drop server ports as agreed upon by the Firm and MIAX membership.

**Configuration:** A FXD can be set up to send messages of one or more MPIDs belonging to the same member firm. For example, a firm has a MM division that use MPID A on one FIX Order Interface (FOI) and an EEM/OFPP division that uses MPID B and MPID C on three other FOIs, a FXD can be set up to send executions for MPID B and MPID C only (note that this excludes executions for MPID A).

**Stock Symbol Format:** Legsymbol will be in the OCC Options Underlying symbol format by default. Firms can opt to receive the LegSymbol in the stock ticker format for stock leg trades of Complex stock-tied orders in the messages “8” and “UCC”. This can be configured per FXD port.

## 2 FIX Message Format and Delivery

Please refer to **FIX v4.2 Protocol** document (<http://fixprotocol.org/specifications>) for details about **FIX message format and delivery**. That section offers insights into the general format of a FIX message being comprised of a *standard header* followed by the message body fields and terminated with a *standard trailer*. It further states that the non-printing, ASCII “SOH” (#001, hex:0x01, referred to in this document as <SOH>) must be used as the field and message delimiter.

FIX Drop will accept FIX session administrative messages from the firm. Any application message sent to the FIX Drop will result in a business reject back to the firm.

### Data Types:

Price field formats are specified in the messages

Char String fields are case sensitive unless otherwise noted

### 2.1 Standard Message Header

The Standard Header precedes each administrative or application message in the FIX protocol. The header identifies the message type, length, destination, sequence number, origination point, and time.

The following table contains the Standard Header tags processed by MIAX. Any other header tag will be ignored.

| Tag | FIX Name    | Req'd | Details  |
|-----|-------------|-------|--|
| 8   | BeginString | Yes   | Always the first field in a FIX message.<br>Valid value: FIX.4.2   |
| 9   | BodyLength  | Yes   | Always the second field in a FIX message.<br>Length of message expressed as the number of characters in the message following the BodyLength field up to, and including, the delimiter immediately preceding the CheckSum tag (“10=”). |

| Tag | FIX Name     | Req'd | Details  |
|-----|--------------|-------|--|
| 35  | MsgType      | Yes   | <p>Always the third field in a FIX message.<br/>Defines the message type.</p> <p>Valid values - Administrative messages:<br/>'0' = Heartbeat<br/>'1' = Test Request<br/>'2' = Resend Request<br/>'3' = Reject (Session level reject)<br/>'4' = Sequence Reset<br/>'5' = Logout<br/>'A' = Logon</p> <p>Valid values – Application messages:<br/>'8' = Execution Report<br/>'j' = Reject (Business message reject)<br/>'UCC' = Trade Cancels and Corrections</p> |
| 34  | MsgSeqNum    | Yes   | Message sequence number (numeric).   |
| 43  | PossDupFlag  | No    | Ignored  |
| 49  | SenderCompID | Yes   | <p>Identifies the party sending the message.<br/>The sending firm should use their Line Identifier as assigned by MIAX.<br/>MIAX will use "MIAX" when sending the messages to Firms.</p>   |
| 52  | SendingTime  | Yes   | <p>Time of message transmission expressed in UTC (Universal Time Coordinated), also known as GMT.<br/>This value must be within 60 seconds of the current time; else the order will be rejected.<br/>Format:<br/>YYYYMMDD–HH:MM:SS.uuu</p>   |
| 56  | TargetCompID | Yes   | <p>Identifies the party receiving the message.<br/>Firms should use the value "MIAX."<br/>MIAX will use the Firm's Line ID when sending the messages to Firms.</p>   |
| 57  | TargetSubID  | Cond. | <p>Sub identifier of the party receiving the message.<br/>Required for application messages delivered to the firms from MIAX.<br/>See Configuration section (1.4) for more detail.</p>   |
| 97  | PossResend   | No    | <p>Ignored in messages sent to MIAX.<br/>Set to Y in messages from MIAX during certain failure/recovery scenarios.</p>   |

| Tag | FIX Name         | Req'd | Details  |
|-----|------------------|-------|--|
| 115 | OnBehalfOfCompID | Cond. | Only applicable to messages sent to MIAX:<br>Identifies the end client that is the originator of the message.<br>This will be returned in the DeliverToCompID of messages corresponding to this message. |
| 116 | OnBehalfOfSubID  | Cond. | Only applicable to messages sent to MIAX:<br>Sub identifier of the end client.<br>This will be returned in the DeliverToSubID of messages corresponding to this message.                                 |
| 122 | OrigSendingTime  | Cond. | Required for resent messages. If no data is available, this value is set to the SendingTime value.<br>Format:<br>YYYYMMDD–HH:MM:SS.uuu   |
| 128 | DeliverToCompID  | Cond. | Only applicable to messages sent from MIAX:<br>MIAX will reflect back the data sent in OnBehalfOfCompID field.   |
| 129 | DeliverToSubID   | Cond. | Only applicable to messages sent from MIAX:<br>MIAX will reflect back the data sent in OnBehalfOfSubID field.  |

## 2.2 Standard Message Trailer

The Standard Trailer terminates each administrative or application message in the FIX protocol. The trailer is used to segregate messages and contains the three-digit character representation of the Check Sum value. Tag must be present even for Firms that have disabled Check Sum validation.

The following table contains the Standard Trailer tags processed by MIAX. Any other Trailer tag will be ignored.

| Tag | FIX Name | Req'd | Details                                 |
|-----|----------|-------|---|
| 10  | Checksum | Yes   | Always the last field of a FIX message. |

## 3 Session Protocol

Please refer to **FIX v4.2 Protocol** document (<http://fixprotocol.org/specifications>) for details about **FIX session protocol**. This protocol layer offers session management capabilities such as establishing a FIX session, authentication, application/administrative messaging over TCP/IP, sequencing of messages, heartbeats and gap fills.

Order sending firm will always be the *Initiator* of the FIX session and MIAX is the *Acceptor*.

## 4 Administrative Messages

This section consists of administrative messages such as those that are used for session protocol.

### 4.1 Logon Request (MsgType = A)

Please refer to **FIX v4.2 Protocol** document for details about **FIX Logon Request**.

The logon message authenticates a user establishing a connection to a remote system. The logon message must be the first message sent by the Firm that needs to initiate a FIX session with the FIX Drop. Firms must wait for a Logon message as a response from the FIX Drop before sending other messages.

The message format is as follows:

| FIX Tag | FIX Name                | Req'd | Details   |
|---------|-------------------------|-------|---|
|         | <i>Standard Header</i>  | Yes   | MsgType = A   |
| 98      | EncryptMethod           | Yes   | (always unencrypted)  |
| 108     | HeartBtInt              | Yes   | Value specified in seconds.<br>Note: Must be > 0 and same value must be used by both sides. |
| 141     | ResetSeqNumFlag         | No    | Indicates both sides of a FIX session should reset sequence numbers                         |
|         | <i>Standard Trailer</i> | Yes   |   |

Points to note:

- Firms can specify a heartbeat interval that is greater than zero and FIX Drop will use the same. Both sides must use that same interval to check if the other side is alive. A Heartbeat interval of 5 seconds is recommended. Upon missing of a single heartbeat, FOI will send a *Test Request*. Upon missing of 2 heartbeats, FIX Drop will send a logout and terminate the connection. MIAX recommends using as low of a value the reliability and latency of your telecommunications channel will allow.
- Encryption is not supported and hence the EncryptMethod field is ignored.
- When Firms reconnect due to a loss of connection, the login response from MIAX may contain a sequence number greater than what the firm expects. This will require the Firm to follow the FIX resend protocol to do a gap fill.

### 4.2 Heartbeat (MsgType = 0)

Please refer to **FIX v4.2 Protocol** document for details about **FIX Heartbeat**.

The heartbeat format is as follows:

| FIX Tag | FIX Name               | Req'd | Details     |
|---------|------------------------|-------|-------------|
|         | <i>Standard Header</i> | Yes   | MsgType = 0 |



|     |                         |      |  |
|-----|-------------------------|------|--|
| 112 | TestReqID               | Cond | Required when the heartbeat is the result of a Test Request message. |
|     | <i>Standard Trailer</i> | Yes  |  |

Points to note:

- Check the Logon message for details about the heartbeat interval
- Each side must send a heartbeat only when the agreed upon interval has elapsed since the last message was sent.

### 4.3 Test Request (MsgType = 1)

Please refer to **FIX v4.2 Protocol** document for details about **FIX Test Request**.

The test request message forces a heartbeat from the opposing application. The test request message checks sequence numbers or verifies communication line status. The opposite application responds to the Test Request with a Heartbeat containing the TestReqID.

The heartbeat format is as follows:

| FIX Tag | FIX Name                | Req'd | Details     |
|---------|-------------------------|-------|-------------|
|         | <i>Standard Header</i>  | Yes   | MsgType = 1 |
| 112     | TestReqID               | Yes   |             |
|         | <i>Standard Trailer</i> | Yes   |             |

Points to note:

- If heartbeat interval + 1 second has elapsed since the last message was received, a Test request can be issued. After two such iterations, the connection must be dropped. This ensures a proactive detection and cleanup of a broken TCP connection.

### 4.4 Resend Request (MsgType = 2)

Please refer to **FIX v4.2 Protocol** document for details about **FIX Resend Request**.

The message format is as follows:

| FIX Tag | FIX Name                | Req'd | Details     |
|---------|-------------------------|-------|-------------|
|         | <i>Standard Header</i>  | Yes   | MsgType = 2 |
| 7       | BeginSeqNo              | Yes   |             |
| 16      | EndSeqNo                | Yes   |             |
|         | <i>Standard Trailer</i> | Yes   |             |

### 4.5 Reject – Session Level (MsgType = 3)

Please refer to **FIX v4.2 Protocol** document for details about **FIX Reject (session level)**.

FOI will disregard any message that is garbled, cannot be parsed or fails a data integrity check. MIAX will also terminate the connection.

The message format is as follows:

| FIX Tag | FIX Name                | Req'd | Details   |
|---------|-------------------------|-------|---|
|         | <i>Standard Header</i>  | Yes   | MsgType = 3   |
| 45      | RefSeqNum               | Yes   | MsgSeqNum of rejected message   |
| 371     | RefTagID                | Cond  | Required if reject reason refers to a specific tag  |
| 372     | RefMsgType              | Yes   | The MsgType of the FIX message being referenced   |
| 373     | SessionRejectReason     | Yes   | Code to identify reason for a session-level Reject message<br>Valid Values:<br>"0" = Invalid tag number<br>"1" = Required tag missing<br>"2" = Tag not defined for this message type<br>"3" = Undefined tag<br>"4" = Tag specified without a value<br>"5" = Value is incorrect (out of range) for this tag<br>"6" = Incorrect data format for value<br>"7" = *Unused/Not applicable*<br>"8" = *Unused/Not applicable*<br>"9" = Comp ID problem<br>"10" = SendingTime accuracy problem<br>"11" = Invalid MsgType |
| 58      | Text                    | No    | Will be supplied if there is a need to supply more information regarding the reject   |
|         | <i>Standard Trailer</i> | Yes   |   |

#### 4.6 Sequence Reset (MsgType = 4)

Please refer to **FIX v4.2 Protocol** document for details about **FIX Sequence Reset (Gap Fill)**.

The message format is as follows:

| FIX Tag | FIX Name                | Req'd | Details     |
|---------|-------------------------|-------|-------------|
|         | <i>Standard Header</i>  | Yes   | MsgType = 4 |
| 123     | GapFillFlag             | No    |             |
| 36      | NewSeqNo                | Yes   |             |
|         | <i>Standard Trailer</i> | Yes   |             |

#### 4.7 Logout Request (MsgType = 5)

Please refer to **FIX v4.2 Protocol** document for details about **FIX Logout Request**.

The logout message initiates or confirms the termination of a FIX session. Disconnection without the exchange of logout messages will be interpreted as an abnormal condition.

Before actually closing the session, the logout initiator must wait for the opposite side to respond with a confirming logout message. This gives the remote end a chance to perform any Gap Fill operations that may be necessary. The session may be terminated if the remote side does not respond in 5 minutes.

After sending the Logout message, the logout initiator should not send any messages unless requested to do so by the logout acceptor via a ResendRequest.

The message format is as follows:

| FIX Tag | FIX Name                | Req'd | Details  |
|---------|-------------------------|-------|--|
|         | <i>Standard Header</i>  | Yes   | MsgType = 5  |
| 58      | Text                    | N     | Can be used to send readable information to the recipient. FOI will just log this and no alerts will be generated on any human readable display devices. |
|         | <i>Standard Trailer</i> | Yes   |  |

## 5 Application Messages

This section consists of application messages.

### 5.1 Execution Report (MsgType = 8)

The MIAX FIX Drop Server transmits execution reports (MsgType = 8) back to the Firm. The execution report message is used to:

- Relay fill information on working orders
- Report post-trade fee calculations associated with a trade.

| FIX Tag | FIX Name               | Req'd | Details  |
|---------|------------------------|-------|--|
|         | <i>Standard Header</i> | Yes   | MsgType = 8  |
| 1       | Account                | No    | As specified on the order. Optional field.   |
| 6       | AvgPx                  | Yes   | Always filled with 0 (zero).   |
| 11      | ClOrdID                | Yes   | Unique identifier of the order. This value uses the ID from the original order. Value must be 30 characters or less. |
| 14      | CumQty                 | Yes   | Total number of filled options.<br>Valid values: 0 – 999,999   |
| 17      | ExecID                 | Yes   | Unique identifier for each Execution Report message. Uniqueness is guaranteed within a single trading day.           |

| FIX Tag | FIX Name      | Req'd | Details   |
|---------|---------------|-------|---|
| 18      | ExecInst      | No    | Instructions for order handling on exchange. Will be the same value as entered in the order (if used).<br>Valid values:<br>f = ISO                              |
| 20      | ExecTransType | Yes   | Identifies the trade type.<br>Valid values:<br>0 = New  |
| 31      | LastPx        | Yes   | Price of the last fill.<br>This field is not required for ExecTransType = 3 (Status).<br><br>(the number of decimal places might vary and is not limited to 3). |
| 32      | LastShares    | Yes   | Quantity of bought/sold contracts on the last fill.<br>This field is not required for ExecTransType = 3 (Status).<br>Valid values: 0 – 999,999                  |
| 37      | OrderID       | Yes   | OrderID, as assigned by MIAX, is required to be unique for each chain of orders.  |
| 38      | OrderQty      | Yes   | The number of contracts (total order quantity).   |
| 39      | OrdStatus     | Yes   | Identifies the current status of an order.<br>Valid values:<br>1 = Partially Filled<br>2 = Filled<br>6 = Pending Cancel   |
| 40      | OrdType       | Yes   | Order type that is specified on the order.<br>Valid values:<br>1 = Market<br>2 = Limit  |
| 41      | OrigClOrdID   | No    | ClOrdID of the canceled or replaced order. This is the target order of the previous request and <b>not</b> the initial order of the day.                        |
| 44      | Price         | Cond  | Price for limit orders (OrdType = 2)<br>Format follows Price field as described in MsgType D, G, s, AB & AC of the FOI specification.                           |
| 54      | Side          | Yes   | Side of order.<br>Valid values:   |

| FIX Tag | FIX Name     | Req'd | Details   |
|---------|--------------|-------|---|
|         |              |       | <p>1 = Buy<br/>2 = Sell<br/>5 = Sell Short (for stock leg)<br/>6 = Sell Short Exempt (for stock leg)</p>  |
| 55      | Symbol       | Yes   | <p>For Option Legs:<br/>The 6 character OCC Security Symbol (class) for an option.<br/>For Equity Legs:<br/>The OCC Options underlying symbol (default) or stock ticker symbol (configurable).</p>  |
| 58      | Text         | Cond  | <p>User requested Cancel and Replace with ExecType equal to "6" or "E" contain partial Canceled Quantity<br/>Format: CxlQty:'value' Eg. CxlQty:40<br/>Unsolicited Canceled (ExecType = 4) will contain a freeform human readable reason for the cancel. (See Error Code 0 in Appendix C)</p>                                    |
| 59      | TimeInForce  | No    | <p>Specifies how long the order remains in effect.<br/>Valid values:<br/>0 = DAY<br/>1 = GTC (Good Till Canceled)<br/>2 = OPG (Opening transaction only or Cancel)<br/>3 = IOC (Immediate or Cancel)<br/>4 = FOK (Fill or Kill)<br/>9 = AtCrossing (Use only in the specified Liquidity gathering event, Auction or Cancel)</p> |
| 60      | TransactTime | No    | <p>Time of execution/order creation expressed in UTC (Universal Time Coordinated), also known as GMT.<br/>Format:<br/>YYYYMMDD-HH:MM:SS.uuu</p>   |
| 77      | OpenClose    | Cond  | <p><i>Option leg only</i><br/>Specifies if this order opens a position or closes a position. Required except for MIAX member or Non-Member Market Maker orders<br/>Valid values:<br/>O = Open<br/>C = Close</p>   |
| 150     | ExecType     | Yes   | <p>Identifies the type of execution report.<br/>Valid values:</p>   |

| FIX Tag | FIX Name          | Req'd | Details   |
|---------|-------------------|-------|---|
|         |                   |       | 1 = Partially filled<br>2 = Filled  |
| 151     | LeavesQty         | Yes   | Number of open contracts for further execution. If the OrdStatus is Canceled or Rejected (no longer active) then LeavesQty = 0, otherwise LeavesQty = OrderQty- CumQty.   |
| 167     | SecurityType      | No    | The type of security.<br>Valid values: "OPT" or "MLEG"  |
| 200     | MaturityMonthYear | No    | <i>Option leg only</i><br>Expiration month and year, as specified on the order.<br>Format: YYYYMM (For example, 201009 is an expiration of September 2010.)   |
| 201     | PutOrCall         | No    | <i>Option leg only</i><br>As specified on the order.<br>Valid values:<br>0 = Put<br>1 = Call  |
| 202     | StrikePrice       | No    | <i>Option leg only</i><br>Strike price for an option, as specified on the order.  |
| 204     | CustomerOrFirm    | No    | Specifies the order origin type that is specified on the order.<br>Valid values:<br>0 = Priority Customer<br>1 = Firm<br>2 = Broker/Dealer<br>4 = Market Maker<br>5 = Non-Member Market Maker<br>8 = Non-Priority Customer                    |
| 205     | MaturityDay       | No    | <i>Option leg only</i><br>Expiration day of month, used in along with MaturityMonthYear (200) to fully specify the maturity date for options.<br>Format: DD   |
| 207     | SecurityExchange  | Cond  | <i>Option leg only</i><br>Exchange ID (MIC code) of the Option Exchange on which this execution occurred when it occurs on an exchange other than MIAX.<br>Example codes from <a href="http://www.iso10383.org/">http://www.iso10383.org/</a> |

| FIX Tag | FIX Name              | Req'd | Details   |
|---------|-----------------------|-------|---|
|         |                       |       | <p>Example Valid Values:</p> <p>“AMXO” = NYSE/AMEX Options</p> <p>“BATO” = BATS Options</p> <p>“XBOX” = BOX Options</p> <p>“C2OX” = C2 Options</p> <p>“XCBO” = CBOE Options</p> <p>“XISX” = ISE Options</p> <p>“GMNI” = ISE Gemini Options</p> <p>“MCRY” = ISE Mercury Options</p> <p>“ARCO” = NYSE/ARCA Options</p> <p>“XNDQ” = Nasdaq Options Market</p> <p>“XPHO” = Nasdaq OMX PHLX Options</p> <p>“XBXO” = Nasdaq BX</p> <p>“EDGO” = BATS EDGX Options</p> <p>“MPRL” = MIAX PEARL Options</p> <p>“EMLD” = MIAX Emerald Options (<i>in future</i>)</p> |
| 442     | MultiLegReportingType | Cond  | <p>Used to indicate what an Execution Report represents for Multileg orders only.</p> <p>Valid Values:</p> <p>2 = Individual Leg of a Multileg Security</p> <p>3 = Multileg Security</p>  |
| 461     | CFICode               | Cond  | <p>CFI code for the individual leg</p> <p>Valid values:</p> <ul style="list-style-type: none"> <li>ES – Equity Shares</li> </ul> <p>Present only for Multileg equity leg. Used to determine what instrument fields are present for this leg.</p>  |
| 467     | IndividualAllocID     | No    | <p>Unique identifier for a specific NoAllocs repeating group used in a cross order.</p>   |
| 528     | OrderCapacity         | Cond  | <p><i>Stock leg only</i></p> <p>Firm’s capacity for the stock leg as specified in the order.</p> <p>Valid values:</p> <p>A = Agency</p> <p>P = Principal</p> <p>R = Riskless Principal</p>  |
| 548     | CrossID               | Cond  | <p>Identification from a cross order. Only populated from New Order Cross orders.</p>   |
| 654     | LegRefID              | Cond  | <p>Identifier from the original order. Only present</p>   |

| FIX Tag | FIX Name                    | Req'd | Details   |
|---------|-----------------------------|-------|---|
|         |                             |       | when tag 442 set to '2'   |
| 1003    | TradeID                     | Cond  | The unique ID that identifies the trade at MIAX. Only available on Fill (ExecType 1 or 2) messages.   |
| 9018    | MIAXExecInst                | No    | Instructions for order handling on exchange. Will be the same value as entered in the order (if used).<br>Valid values:<br>P = ABBO Price Protection (APP)<br>A = Auction on Arrival (AOA)  |
| 9207    | StockExecutionDestination   | Cond  | <i>Stock leg only</i><br>Stock trading/reporting venue that will report and clear the stock leg trade<br>Valid Values:<br>1 – NASDAQ TRF  |
| 9385    | AuctionID                   | Cond  | Only present if this is an execution that occurred as a part of a liquidity gathering event (eg. Auctions, route timers).<br>Event ID of the Liquidity Event in which this execution occurred.  |
| 9449    | BillingMPID                 | No    | Only present if the alternative BillingMPID was provided at Order entry and it is different than the Executing Broker MPID supplied in tag SenderSubID or FirmMPID.   |
| 9730    | AdditionalBillingParameters | Cond  | For Order Executions (ExecType=1 or 2):<br>A field containing additional (not contained elsewhere in Execution report or Order) parameters required for MIAX billing.<br>See Appendix for details.<br>For other Execution reports (ExecType is not 1 or 2): Tag will not be sent. |
| 9946    | FirmMPID                    | No    | Only present if execution report is for a fill or partial fill resulting from a New Order Cross message.  |
|         | <i>Standard Trailer</i>     | Yes   |   |

## 5.2 Trade Cancel/Correct (MsgType = UCC)

The MIAX FIX Drop server transmits trade cancellations and corrections using this message format. This message is sent to relay information such as (but not limited to)



- A trade cancellation (bust)
- A price/size correction on a trade
- A clearing change correction on a trade. Clearing change includes
  - Trade split that results in one or more new trades, each of which will be transmitted using MsgType = UCC
  - Trade reassignment to another EEM MPID that may result in trade cancellation and new trade which will be transmitted using MsgType = UCC
  - Updates to clearing information, eg. Clearing MPID, CMTA, Account, Open/Close, Order Text , Origin, Directed Firm Code (DFC)

| FIX Tag | FIX Name               | Req'd | Details  |
|---------|------------------------|-------|--|
|         | <i>Standard Header</i> | Yes   | MsgType = UCC  |
| 20      | ExecTransType          | Y     | 0 = New Manual Trade (only due to clearing change)<br>1 = Trade Cancel<br>2 = Trade Correct<br><br>Note: New Manual Trade and Trade Cancel messages can be generated due to a Clearing change correction. See CorrectionType field for details.  |
| 9020    | CorrectionType         | Y     | 1 = Not Applicable (Used when message is generated due to a trade cancel)<br>2 = Price and/or Size change<br>3 = This side Clearing change<br>4 = Contra side Clearing change<br>5 = Both side Clearing change<br><br>Note: Clearing change includes trade split/reassignment that may result in New Manual Trade and Trade Cancel messages.       |
| 17      | ExecID                 | Y     | It is always the ExecID in the original trade  |
| 1003    | TradeID                | Y     | MIAX assigned unique Trade ID for the day for a New Manual Trade created due to a clearing change<br><br>When not a New Manual Trade, same as the Trade ID of the cancelled or corrected trade.<br><br>Note: When TradeID is used in conjunction with CorrectionNum, Side and ExecTransType, this is a unique identifier for each corrected trade. |

| FIX Tag | FIX Name          | Req'd | Details   |
|---------|-------------------|-------|---|
| 1126    | OrigTradeID       | N     | TradeID of the trade being corrected.<br><br>Note: When the message is for a New Manual Trade, this is TradeID of the trade that had the clearing change correction resulting in this New Manual Trade                            |
| 9021    | CorrectionNum     | Y     | Trade correction number.<br><br>Used to identify version of the trade being corrected or canceled. Increments by 1 for each subsequent correction. New trades resulting from corrections may have a non-zero number.              |
| 37      | OrderID           | Y     | From original trade   |
| 11      | ClOrdID           | Y     | From original trade   |
| 42      | OrigTime          | Y     | GMT date-time of trade being corrected or cancelled   |
| 60      | TransactTime      | Y     | GMT date-time of the cancel/correct trade   |
| 167     | SecurityType      | Y     | The type of security.<br>Valid values: "OPT" or "MLEG"  |
| 55      | Symbol            | Y     | From original trade   |
| 200     | MaturityMonthYear | Cond  | From original trade, if option leg  |
| 205     | MaturityDay       | Cond  | From original trade, if option leg  |
| 201     | PutOrCall         | Cond  | From original trade, if option leg  |
| 202     | StrikePrice       | Cond  | From original trade, if option leg  |
| 461     | CFIcode           | Cond  | CFI code for the individual leg<br>Valid values:<br><ul style="list-style-type: none"> <li>ES – Equity Shares</li> </ul> Present only for Multileg equity leg. Used to determine what instrument fields are present for this leg. |
| 54      | Side              | Y     | From original trade   |
| 31      | LastPX            | Y     | For Price/Size change, it is the latest price. Else, the value in the trade being corrected or cancelled  |
| 32      | LastShares        | Y     | For Price/Size change and split trades, it is the latest size. Else, the value in the trade being corrected or cancelled  |
| 77      | OpenClose         | Cond  | <i>Option leg only</i><br>If changed in correction, the latest corrected value. Else, the value supplied in the order   |

| FIX Tag | FIX Name                  | Req'd | Details  |
|---------|---------------------------|-------|--|
| 109     | ClientID                  | Cond  | <i>Option leg only</i><br>Clearing MPID.<br><br>If changed in correction, the latest corrected value. Else, the value supplied in the order.<br><br>If it is not provided in the order, it is the same as ExecutingMPID/TargetSubID. |
| 1       | Account                   | N     | If changed in correction, the latest corrected value. Else, the value supplied in the order.   |
| 439     | ClearingFirm              | N     | CMTA<br>If changed in correction, the latest corrected value. Else, the value supplied in the order  |
| 440     | ClearingAccount           | N     | If changed in correction, the latest corrected value. Else, the value supplied in the order  |
| 442     | MultiLegReportingType     | Cond  | Used to indicate what an Execution Report represents for Multileg orders only.<br>Valid Values:<br>2 = Individual Leg of a Multileg Security<br>3 = Multileg Security  |
| 528     | OrderCapacity             | Cond  | <i>Stock leg only</i><br>Firm's capacity for the stock leg as specified in the order.<br>Valid values:<br>A = Agency<br>P = Principal<br>R = Riskless Principal  |
| 654     | LegRefID                  | Cond  | Identifier from the original order. Only present when tag 442 set to '2'   |
| 58      | Text                      | N     | If changed in correction, the latest corrected value. Else, the value supplied in the order  |
| 9207    | StockExecutionDestination | Cond  | <i>Stock leg only</i><br>Stock trading/reporting venue that will report and clear the stock leg trade<br>Valid Values:<br>1 – NASDAQ TRF   |
| 9372    | StockClearingAccount      | Cond  | <i>Stock leg only</i><br>If changed in correction, the latest corrected value.   |

| FIX Tag | FIX Name                    | Req'd | Details   |
|---------|-----------------------------|-------|---|
| 9730    | AdditionalBillingParameters | N     | Latest changes to additional billing parameters. Format is the same as tag 9730 reported in FOI/FXD execution report. See Appendix A for details on AdditionalBillingParameters.<br><br>Note: Updates to Origin and Directed Firm Code (DFC) will be sent as part of AdditionalBillingParameters. |
|         | <i>Standard Trailer</i>     | Yes   |   |

Points to note:

- Trade corrections or busts do not change the state or open contracts of orders
- Only Trade cancels and corrections of EEMs Orders are sent via this message
- Each correction will result in a Trade Cancel/Correct message (MsgType = UCC) to both the sides, if eligible based on MPID entitlement. In Clearing change update messages, contra side may see only an updated CorrectionNum
- **Important:** MIAX may choose to retransmit Trade Cancel/Correct messages in response to an interruption of the FIX Drop service. MIAX will coordinate with the firms before initiating these retransmissions. Firms can use a combination of TradeID, CorrectionNum, Side and ExecTransType as a unique key to know if a given message is a retransmitted message

## 6 Business Reject (MsgType = j)

Any business level message type from a firm will result in a business reject (j).

Note that if the message fails session level checks (e.g. incorrect body length, required tag missing, etc.), a session level reject (3) will be issued.

| FIX Tag | FIX Name               | Req'd | Details  |
|---------|------------------------|-------|--|
|         | <i>Standard Header</i> | Yes   | MsgType = j  |
| 45      | RefSeqNum              | Yes   | MsgSeqNum of rejected message  |
| 372     | RefMsgType             | Yes   | MsgType of the FIX message being rejected  |
| 379     | BusinessRejectRefID    | Yes   | RefID of the message being rejected. This is the ExecID in case an Execution report is being rejected and this is the ClOrdID in case an Order/Cancel message is being rejected. This will be the CrossID in case a New Order Cross is being rejected. |
| 380     | BusinessRejectReason   | Yes   | Code to identify reason for Business rejection.<br>Valid values:<br>0 = Other<br>3 = Unsupported Message Type  |
| 58      | Text                   | Cond  | Required if BusinessRejectReason = 0   |

| FIX Tag | FIX Name                | Req'd | Details |
|---------|-------------------------|-------|---------|
|         | <i>Standard Trailer</i> | Yes   |         |

## Appendix A: Additional Billing Parameters

MIAX will provide parameters used by MIAX for billing in tag 9730 of *execution report* message for all executions (trades). The following table gives the breakup of that field:

| Position | Number of Characters | Parameter Name     | Description   |
|----------|----------------------|--------------------|---|
| 1        | 1                    | OrderOrigin        | Origin (CustomerOrFirm) of the firm's side of the order   |
| 2        | 1                    | ContraOrigin       | Origin (CustomerOrFirm) of the opposite side of this trade  |
| 3        | 1                    | PriorityIndicator  | Only applicable for MM origin.<br>'Y' = Yes<br>'N' = No<br>" (space) = N/A  |
| 4        | 1                    | MMRole             | Only applicable for MM origin.<br>'P' = PLMM<br>'L' = LMM<br>'R' = RMM<br>'U' = UMM (UMM: Unassigned to quote in this class)<br>" (Space) = N/A   |
| 5        | 1                    | LiquidityTimerRole | When the liquidity is involved in a trade occurring in a MIAX PRIME Auction or Timer Event such as a Route and Liquidity Refresh as defined in field "AuctionType", this field contains the role of the liquidity.<br>Possible values:<br>'I' = Timer Initiator or PRIME Agency Order or PRIME Qualified Contingent Cross Agency Order<br>'J' = Timer Joiner on same side as Timer Initiator<br>'T' = Liquidity received before and on the same side as Timer Initiator or PRIME Agency Order<br>'B' = Received on opposite side of Initiator/Agency order before Timer/Auction stated<br>'A' = Received on opposite side of Initiator/Agency order after Timer/Auction started<br>'R' = Received as a response and on opposite side of Timer Initiator or PRIME Agency Order after event started<br>'E' = Managed interest filled by PRIME Agency Order before the auction starts<br>'K' = PRIME Contra order that trades with Agency Order at the end of auction or PRIME Qualified |

| Position | Number of Characters | Parameter Name     | Description   |
|----------|----------------------|--------------------|---|
|          |                      |                    | Contingent Cross Contra order that trades with Agency Order<br>'P' = PRIME Customer Cross<br>' ' (space) = N/A (Not Applicable)<br>'*' (asterisk) = downgraded for older version  |
| 6        | 1                    | ClassType          | Indicates whether the underlying is being billed as maker/taker.<br>'C' = Conventional<br>'M' = Maker/Taker   |
| 7        | 1                    | LiquidityIndicator | 'A' = Add<br>'R' = Remove<br>'N' = Not Applicable   |
| 8        | 1                    | MbboMPV            | 'P' = PennyAlways<br>'N' = Penny/Nickel<br>'D' = Nickel/Dime<br>' ' (space) = Not Applicable  |
| 9        | 1                    | MarketState        | 'N' = Normal Trading<br>'A' = Auction<br>'R' = Routing Timer<br>' ' (space) = Not Applicable  |
| 10       | 4                    | DirectedFirmCode   | Directed Firm Code (DFC) of the participant that the order was directed to  |
| 14       | 1                    | DirectedStatus     | Status of directed order flow.<br>Directed:<br>'E' = Directed to DLMM assigned to Underlying<br>'U' = Directed to DLMM not assigned to Underlying<br>Not Directed:<br>'N' = Non-directed Order (NDO)<br>'X' =DFC invalid<br>'I' = Not directed due to Order origin (Origin not Priority Customer) |
| 15       | 1                    | AuctionType        | '1' = Opening ,<br>'2' = Reopening,<br>'3' = Closing,<br>'4' = Routing ,<br>'5' = Liquidity Refresh,<br>'6' = PRIME Paired Order,<br>'7' = PRIME Customer-to-Customer Cross,<br>'8' = PRIME Qualified Contingent Cross,   |

| Position | Number of Characters | Parameter Name            | Description   |
|----------|----------------------|---------------------------|---|
|          |                      |                           | ' ' = Not Applicable (space)<br>'*' (asterisk) = downgraded for older version   |
| 16       | 6                    | RoutedOrderQty            | Total Routed Away Quantity.<br>Format: Fixed length integer prepended with zero I.E. 000012   |
| 22       | 1                    | TradedWithDirected MM     | Indicates if the trade occurred with the MM to which the order was Directed:<br>'Y' = Yes<br>'N' = No<br>" (space) = Not Applicable   |
| 23       | 1                    | ContraTimeInForce         | 0 = DAY<br>1 = GTC (Good Till Canceled)<br>2 = OPG (Opening transaction only or Cancel)<br>3 = IOC (Immediate or Cancel)<br>4 = FOK (Fill or Kill)<br>9 = AtCrossing (Use only in the Liquidity gathering event specified in EventID; Auction or Cancel Order)<br>'*' (asterisk) = downgraded for older version   |
| 24       | 1                    | ContraLiquidityTimer Role | When the liquidity is involved in a trade occurring in a PRIME Auction or Timer Event such as a Route and Liquidity Refresh as defined in field "AuctionType", this field contains the role of the liquidity.<br>Possible values:<br>'I' = Timer Initiator or PRIME Agency Order or PRIME Qualified Contingent Cross Agency Order<br>'J' = Timer Joiner on same side as Timer Initiator<br>'T' = Liquidity received before and on the same side as Timer Initiator or PRIME Agency Order<br>'B' = Received on opposite side of Initiator/Agency order before Timer/Auction started<br>'A' = Received on opposite side of Initiator/Agency order after Timer/Auction started<br>'R' = Received as a response and on opposite side of Timer Initiator or PRIME Agency Order after event started<br>'E' = Managed interest filled by PRIME Agency order before the auction starts<br>'K' = PRIME Contra order that trades with Agency Order at the end of auction or PRIME Qualified |



| Position | Number of Characters | Parameter Name      | Description  |
|----------|----------------------|---------------------|--|
|          |                      |                     | Contingent Cross Contra order that trades with Agency Order<br>'P' = PRIME Customer Cross<br>' ' (space) = N/A (Not Applicable)<br>'*' (asterisk) = downgraded for older version   |
| 25       | 1                    | StrategyAuctionType | Possible values:<br>' ' (space) = Not Applicable<br>'I' = Initial Improvement Opening<br>'Y' = Initial Improvement Opening: Book Crossed<br>'U' = Upon Receipt Improvement<br>'R' = Reevaluation Improvement<br>'P' = Reevaluation Improvement: Book Crossed<br>'C' = Immediate Book Uncrossing<br>'*' (asterisk) = downgraded for older version   |
| 26       | 1                    | StrategyTimerRole   | When the liquidity is involved in a trade occurring in a Complex Standard Auction as defined in field StrategyAuctionType, or a cPRIME auction or cC2C or cQCC crossing, this field contains the role of the liquidity:<br>'I' = Standard Auction Initiator or cPRIME Agency Order or cQCC Agency Order<br>'J' = Joiner (un-related) on the same side of initiator and received after auction started<br>'T' = Pre- existing on the same side of initiator and received before auction started<br>'B' = Pre- existing on opposite side of Initiator and received before auction stated<br>'A' = Un-related on opposite side of Initiator and received after auction started<br>'R' = Response on opposite side of Initiator and received after event started<br>'G' = Response on the same side of initiator and received after auction started<br>'K' = cPRIME Contra Order that trades with Agency Order at the end of auction or cQCC Contra Order that trades with Agency Order<br>'P' = cC2C Order<br>' ' (space) = N/A (Not Applicable)<br>'*' (asterisk) = downgraded for older version |
| 27       | 1                    | ContraStrategyTimer | When the liquidity is involved in a trade occurring in a   |

| Position | Number of Characters | Parameter Name | Description   |
|----------|----------------------|----------------|---|
|          |                      | Role           | <p>Complex Standard Auction as defined in field StrategyAuctionType, or a cPRIME auction or cC2C or cQCC crossing, this field contains the role of the liquidity:</p> <p>'I' = Standard Auction Initiator or cPRIME Agency Order or cQCC Agency Order</p> <p>'J' = Joiner (un-realted) on the same side of initiator and received after auction started</p> <p>'T' = Pre- existing on the same side of initiator and received before auction started</p> <p>'B' = Pre- existing on opposite side of Initiator and received before auction stated</p> <p>'A' = Un-related on opposite side of Initiator and received after auction started</p> <p>'R' = Response on opposite side of Initiator and received after event started</p> <p>'G' =Response on the same side of initiator and received after auction started</p> <p>'K' = cPRIME Contra Order that trades with Agency Order at the end of auction or cQCC Contra Order that trades with Agency Order</p> <p>'P' = cC2C Order</p> <p>' ' (space) = N/A (Not Applicable)</p> <p>'*' (asterisk) = downgraded for older version</p> |
| 28       | 1                    | Strategy State | <p>Possible values:</p> <p>' ' (space) = Not Applicable</p> <p>'A' = Standard Auction</p> <p>'F' = Free Trading</p> <p>'P' = cPRIME</p> <p>'X' = cC2C</p> <p>'Q' = cQCC</p> <p>'*' (asterisk) = downgraded for older version</p>  |

## **Appendix B: Contact List**

Please visit MIAX website at <http://www.MIAXOptions.com> for obtaining most up-to-date contact list and other such information.

## Appendix C: Revision History

| Revision Date               | Version | Author          | Description   |
|-----------------------------|---------|-----------------|---|
| June 29 2015                | 1.0     | Muna Tang       | First Release   |
| Jan 15 2016                 | 1.1     | Siddharth Sahoo | Added message for trade cancellation and corrections (MsgType = UCC)<br>Message type 8 – Support for MIAX PEARL Market  |
| Feb 1 2016                  | 2.0     | Kevin Mueller   | Added support for Complex (Strategy) Orders:<br>MsgType 8:<br>Add values to tag 44<br>Clarifications in Tag 55<br>Added MLEG to tag 167<br>Added new tags 442, 461, 654 and 9018<br>Added new fields to Additional Billing Parameters: 25, 26, and 26.<br>MsgType UCC:<br>Added new tags 167, 442 and 645   |
| March 24 <sup>th</sup> 2016 | 2.1     | Kevin Mueller   | MsgType 8 – removed BMO from tag 9018   |
| Apr 3 <sup>rd</sup> 2017    | 2.2     | Siddharth Sahoo | Complex Crossing Order enhancements<br>Appendix D (Additional Billing Parameters):<br>Added a new field “Strategy State”.<br>Added values ‘K’ and ‘P’ and updated description for value ‘I’ for fields – Strategy Timer Role and Contra Strategy Timer Role   |
| Feb 16 <sup>th</sup> 2018   | 2.3     | Siddharth Sahoo | Stock-tied strategy trading enhancements.<br>MsgType = 8:<br>Added to list of valid values for Side<br>Noted that these fields are present for option leg message only – OpenClose, MaturityMonthYear, PutOrCall, StrikePrice, MaturityDay, SecurityExchange<br>Added new stock leg only fields – OrderCapacity, StockExecutionDestination<br>MsgType = UCC:<br>Noted that these fields are conditional and are present for option leg only – OpenClose, MaturityMonthYear, PutOrCall, StrikePrice, MaturityDay |

| Revision Date               | Version | Author    | Description   |
|-----------------------------|---------|-----------|---|
|                             |         |           | Added new fields CFICode, OrderCapacity, StockExecutionDestination, StockClearingAccount  |
| Jun 27 <sup>th</sup> , 2018 | 2.3a    | Vinay Rao | Firms can now opt-in to receive the stock symbol in ticker symbol format for stock leg trades of Complex Stock-tied orders in the messages types "8" and "UCC". |