MIAX Sapphire Options Exchange

Options FIX Drop using FIX Protocol

FIX Drop Specification

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1. Overview

The MIAX Sapphire 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.fixtrading.org/standards.

This specification is intended to only be used by MIAX Sapphire member firms and the firms that are sponsored for MIAX Sapphire access by Sapphire member firms. MIAX Sapphire is referred to as Sapphire for the rest of this document.

1.1 Exchange Related Information

1.1.1 Hours of Operation for Sapphire Options Exchange

Note: Times specified below are as per timings of United States Eastern Time zone.

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

Firms are expected to stay connected at least until End of Order Cancel Acceptance because system can send executions and cancels due to production closing logic. Disconnecting before that can result in not receiving key information about order status changes.

1.1.2 Additional 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 the MIAX website.

1.2 Certification for the FIX Drop

Sapphire 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.

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In order to connect to Sapphire production, member firms must certify their application with Sapphire. This certification testing is a manual process. In order to schedule a certification test, please email MIAX 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 acknowledgements, rejects, cancel 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, Sapphire 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 Sapphire 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 Sapphire 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. Sapphire will allow connections from a preconfigured computer (CompID).

Firm to Sapphire

SenderCompID	TargetCompID
Firm Comp ID	SPHR

Sapphire to Firm

SenderCompID	TargetCompID
SPHR	Firm Comp ID

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

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

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

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2. FIX Message Format and Delivery

Please refer to **FIX v4.2 Protocol** document (http://www.fixtrading.org/standards) 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 Sapphire. Any other header tag will be ignored.

Tag	FIX Name	Req'd	Details
8	BeginString	Yes	Always the first field in a FIX message. Valid value: FIX.4.2
9	BodyLength	Yes	Always the second field in a FIX message. 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=").

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Tag	FIX Name	Req'd	Details
35	MsgType	Yes	Always the third field in a FIX message. Defines the message type. Valid values - Administrative messages: '0' = Heartbeat '1' = Test Request '2' = Resend Request '3' = Reject (Session level reject) '4' = Sequence Reset '5' = Logout 'A' = Logon Valid values – Application messages: '8' = Execution Report 'j' = Reject (Business message reject) 'UCC' = Trade Cancels and Corrections
34	MsgSeqNum	Yes	Message sequence number (numeric).
43	PossDupFlag	No	Ignored
49	SenderCompID	Yes	Identifies the party sending the message. The sending firm should use their Line Identifier as assigned by Sapphire. Sapphire will use "SPHR" when sending the messages to Firms.
52	SendingTime	Yes	Time of message transmission expressed in UTC (Universal Time Coordinated), also known as GMT. This value must be within 60 seconds of the current time; else the order will be rejected. Format (Configurable for messages sent from Sapphire): YYYYMMDD–HH:MM:SS.mmm YYYYMMDD–HH:MM:SS.uuuuuu YYYYMMDD–HH:MM:SS.nnnnnnnnn
56	TargetCompID	Yes	Identifies the party receiving the message. Firms should use the value "SPHR" Sapphire will use the Firm's Line ID when sending the messages to Firms.

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Tag	FIX Name	Req'd	Details
57	TargetSubID	Cond.	Sub identifier of the party receiving the message. Required for application messages delivered to the firms from Sapphire. See Configuration section (1.4 Configuration) for more detail.
97	PossResend	No	Ignored in messages sent to Sapphire. Set to Y in messages from Sapphire during certain failure/recovery scenarios.
115	OnBehalfOfCompID	Cond.	Only applicable to messages sent to Sapphire: Identifies the end client that is the originator of the message. This will be returned in the DeliverToCompID of messages corresponding to this message.
116	OnBehalfOfSubID	Cond.	Only applicable to messages sent to Sapphire: Sub identifier of the end client. 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. Format (Configurable for messages sent from Sapphire): YYYYMMDD–HH:MM:SS.mmm YYYYMMDD–HH:MM:SS.uuuuuu YYYYMMDD–HH:MM:SS.nnnnnnnnn
128	DeliverToCompID	Cond.	Only applicable to messages sent from Sapphire: Sapphire will reflect back the data sent in OnBehalfOfCompID field.
129	DeliverToSubID	Cond.	Only applicable to messages sent from Sapphire: Sapphire will reflect back the data sent in OnBehalfOfSubID field.

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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 Sapphire. Any other Trailer tag will be ignored.

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

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3. Session Protocol

Please refer to **FIX v4.2 Protocol** document (http://www.fixtrading.org/standards) 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 Sapphire is the *Acceptor*.

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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
	Standard Header	Yes	MsgType = A
98	EncryptMethod	Yes	(always unencrypted)
108	HeartBtInt	Yes	Value specified in seconds. 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
	Standard Trailer	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. Sapphire 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 Sapphire 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:

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FIX Tag	FIX Name	Req'd	Details
	Standard Header	Yes	MsgType = 0
112	TestReqID	Cond	Required when the heartbeat is the result of a Test Request message.
	Standard Trailer	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
	Standard Header	Yes	MsgType = 1
112	TestReqID	Yes	
	Standard Trailer	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
	Standard Header	Yes	MsgType = 2

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FIX Tag	FIX Name	Req'd	Details
7	BeginSeqNo	Yes	
16	EndSeqNo	Yes	
	Standard Trailer	Yes	

4.5 Reject – Session Level (MsgType = 3)

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

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

The message format is as follows:

FIX Tag	FIX Name	Req'd	Details
	Standard Header	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 Valid Values: "0" = Invalid tag number "1" = Required tag missing "2" = Tag not defined for this message type "3" = Undefined tag "4" = Tag specified without a value "5" = Value is incorrect (out of range) for this tag "6" = Incorrect data format for value "7" = *Unused/Not applicable* "8" = *Unused/Not applicable* "9" = Comp ID problem "10" = SendingTime accuracy problem "11" = Invalid MsgType
58	Text	No	Will be supplied if there is a need to supply more information regarding the reject
	Standard Trailer	Yes	

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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
	Standard Header	Yes	MsgType = 4
123	GapFillFlag	No	
36	NewSeqNo	Yes	
	Standard Trailer	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
	Standard Header	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.
	Standard Trailer	Yes	

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5. Application Messages

This section consists of application messages.

5.1 Execution Report (MsgType = 8)

The Sapphire 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
	Standard Header	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 option contracts or stock shares.
17	ExecID	Yes	Unique identifier for each Execution Report message. Uniqueness is guaranteed within a single trading day.
18	ExecInst	No	Instructions for order handling on exchange. Will be the same value as entered in the order (if used). Valid values: f = ISO
20	ExecTransType	Yes	Identifies the trade type. Valid values: 0 = New
31	LastPx	Yes	Price of the last fill. (The number of decimal places might vary and is not limited to 3).
32	LastShares	Yes	Quantity of bought/sold contracts/shares on the last fill.
37	OrderID	Yes	OrderID, as assigned by Sapphire, is required to be unique for each chain of orders.
38	OrderQty	Yes	The number of option contracts or stock shares.
39	OrdStatus	Yes	Identifies the current status of an order. Valid values: 1 = Partially Filled 2 = Filled 6 = Pending Cancel
40	OrdType	Yes	Order type that is specified on the order.

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FIX Tag	FIX Name	Req'd	Details
			Valid values: 1 = Market 2 = Limit
41	OrigClOrdID	No	ClOrdID of the canceled or replaced order. This is the target order of the previous request and **not** the initial order of the day.
44	Price	Cond	Price for limit orders (OrdType = 2) Format follows Price field as described in MsgType D, s, AB, As, G & AC of the FOI specification.
54	Side	Yes	Side of order. Valid values: 1 = Buy 2 = Sell 5 = Sell Short (for stock leg) 6 = Sell Short Exempt (for stock leg)
55	Symbol	Yes	For Option Legs: The 6 character OCC Security Symbol (class) for an option. For Equity Legs: The OCC Options underlying symbol (default) or stock ticker symbol (configurable).
58	Text	Cond	User requested Cancel and Replace with ExecType equal to "6" or "E" contain partial Canceled Quantity Format: CxlQty:'value' e.g. CxlQty:40 Unsolicited Canceled (ExecType = 4) will contain a freeform human readable reason for the cancel. (See Error Code 0 in Appendix C)
59	TimeInForce	No	Specifies how long the order remains in effect. Valid values: 0 = DAY 3 = IOC (Immediate or Cancel)
60	TransactTime	No	Time of execution/order creation expressed in UTC (Universal Time Coordinated), also known as GMT. Configurable Format: YYYYMMDD–HH:MM:SS.mmm YYYYMMDD–HH:MM:SS.uuuuuu YYYYMMDD–HH:MM:SS.nnnnnnnnn
76	ExecBroker	No	Specifies order handling. Valid values: "DNR" = Do not route (Trade at Sapphire or post to Sapphire book. Never route away)

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FIX Tag	FIX Name	Req'd	Details
			Default: If this tag is absent, the order may be eligible for routing as per Sapphire routing rules.
77	OpenClose	Cond	*Option leg only* Specifies if this order opens a position or closes a position. Required except for Sapphire member or Non-Member Market Maker orders Valid values: O = Open C = Close
150	ExecType	Yes	Identifies the type of execution report. Valid values: 1 = Partially filled 2 = Filled
151	LeavesQty	Yes	Number of open option contracts or stock shares for further execution. LeavesQty = OrderQty- CumQty, or LeavesQty = OrderQty * LegRatio - CumQty.
167	SecurityType	No	The type of security. Valid values: "OPT" or "MLEG"
200	MaturityMonthYear	No	*Option leg only* Expiration month and year, as specified on the order. Format: YYYYMM (For example, 201009 is an expiration of September 2010.)
201	PutOrCall	No	*Option leg only* As specified on the order. Valid values: 0 = Put 1 = Call
202	StrikePrice	No	*Option leg only* Strike price for an option, as specified on the order.
204	CustomerOrFirm	No	*Option leg only* Specifies the order origin type that is specified on the order. Valid values: 0 = Priority Customer 1 = Firm 2 = Broker/Dealer 4 = Market Maker 5 = Non-Member Market Maker 8 = Non-Priority Customer
205	MaturityDay	No	*Option leg only*

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FIX Tag	FIX Name	Req'd	Details
			Expiration day of month, used in along with MaturityMonthYear (200) to fully specify the maturity date for options. Format: DD
207	SecurityExchange	Cond	*Option leg only* Exchange ID (MIC code) of the Option Exchange on which this execution occurred when it occurs on an exchange other than Sapphire. Example codes from http://www.iso10383.org/ Example Valid Values: "AMXO" = NYSE/AMEX Options "BATO" = BATS Options "XBOX" = BOX Options "C2OX" = C2 Options "XCBO" = CBOE Options "XISX" = ISE Options "GMNI" = ISE Gemini Options "MCRY" = ISE Mercury Options "ARCO" = NYSE/ARCA Options "XNDQ" = Nasdaq Options Market "XPHO" = Nasdaq OMX PHLX Options "XBXO" = Nasdaq BX "EDGO" = BATS EDGX Options "XMIO" = MIAX Options "MPRL" = MIAX Pearl Options "EMLD" = MIAX Emerald Options "MXOP" = Members Exchange "IEXO" = IEX Options "MXTO" = MX2 Options
442	MultiLegReportingType	Cond	Used to indicate what an Execution Report represents for Multileg orders only. Valid Values: 2 = Individual Leg of a Multileg Security 3 = Multileg Security
461	CFICode	Cond	CFI code for the individual leg Valid values: • ES – Equity Shares Present only for Multileg equity leg. Used to determine what instrument fields are present for this leg.
467	IndividualAllocID	No	Unique identifier for a specific NoAllocs repeating group used in a cross order.
528	OrderCapacity	Cond	*Stock leg only*

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461	CFICode	Cond	CFI code for the individual leg Valid values: • ES – Equity Shares Present only for Multileg equity leg. Used to determine what instrument fields are present for this leg.
			Firm's capacity for the stock leg as specified in the order. Valid values: A = Agency P = Principal R = Riskless Principal
548	CrossID	Cond	Identification from a cross order. Only populated from New Order Cross orders.
654	LegRefID	Cond	Identifier from the original order. Only present when tag 442 set to '2'
1003	TradeID	Cond	The unique ID that identifies the trade at Sapphire. 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). Valid values: P = ABBO Price Protection (APP)
9207	StockExecutionDestination	Cond	*Stock leg only* Stock trading/reporting venue that will report and clear the stock leg trade Valid Values: 1 – NASDAQ TRF
9463	BillingTradeType	No	One byte optional billing data as specified, in the order. Only present if execution report is for a fill or partial fill.
9730	AdditionalBillingParameters	Cond	For Order Executions (ExecType=1 or 2): A field containing additional (not contained elsewhere in Execution report or Order) parameters required for Sapphire billing. See Appendix A: Additional Billing Parameters for details. 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.
	Standard Trailer	Yes	

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5.2 Trade Cancel/Correct (MsgType = UCC)

The Sapphire 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, e.g. Clearing MPID, CMTA, Account, Open/Close, Order Text, Origin

FIX Tag	FIX Name	Req'd	Details
	Standard Header	Yes	MsgType = UCC
20	ExecTransType	Y	0 = New Manual Trade (only due to clearing change) 1 = Trade Cancel 2 = Trade Correct 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) 2 = Price and/or Size change 3 = This side Clearing change 4 = Contra side Clearing change 5 = Both side Clearing change 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	Sapphire assigned unique Trade ID for the day for a New Manual Trade created due to a clearing change When not a New Manual Trade, same as the Trade ID of the cancelled or corrected trade. Note: When TradeID is used in conjunction with CorrectionNum, Side and ExecTransType, this is a unique identifier for each corrected trade.

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FIX Tag	FIX Name	Req'd	Details
1126	OrigTradeID	N	TradeID of the trade being corrected. 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. 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. Valid values: "OPT" ορ □ΜΛΕΓ□
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 Valid values: • ES – Equity Shares 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	*Option leg only* If changed in correction, the latest corrected value. Else, the value supplied in the order
109	ClientID	Cond	*Option leg only* Clearing MPID. If changed in correction, the latest corrected value. Else, the value supplied in the order. If it is not provided in the order, it is the same as ExecutingMPID/TargetSubID.

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1	Account	N	If changed in correction, the latest corrected value. Else, the value supplied in the order.
439	ClearingFirm	N	CMTA 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 a Trade Cancel/Correct represents for Multileg orders only. Valid Values: 2 = Individual Leg of a Multileg Security 3 = Multileg Security
528	OrderCapacity	Cond	*Stock leg only* Firm's capacity for the stock leg as specified in the order. Valid values: A = Agency P = Principal 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	*Stock leg only* Stock trading/reporting venue that will report and clear the stock leg trade Valid Values: 1 – NASDAQ TRF
9372	StockClearingAccount	Cond	*Stock leg only* If changed in correction, the latest corrected value.
9463	BillingTradeType	N	If changed in correction, the latest corrected value. Else, the value supplied in the order.
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. Note: Updates to Origin will be sent as part of AdditionalBillingParameters.
	Standard Trailer	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

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- 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**: Sapphire may choose to retransmit Trade Cancel/Correct messages in response to an interruption of the FIX Drop service. Sapphire 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

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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
	Standard Header	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. Valid values: 0 = Other 3 = Unsupported Message Type
58	Text	Cond	Required if BusinessRejectReason = 0
	Standard Trailer	Yes	

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Appendix A: Additional Billing Parameters

Sapphire will provide parameters used by Sapphire 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	ClassType	Indicates whether the underlying is being billed as maker/taker. 'T' = Taker/Maker '*' (asterisk) = New value masked for backward compatibility. Upgrade to new version to see new values.
4	1	LiquidityIndicator	'M' = Maker 'T' = Taker 'N' = Not Applicable '*' (asterisk) = New value masked for backward compatibility. Upgrade to new version to see new values.
5	1	SbboMPV	'P' = PennyAlways 'N' = Penny/Nickel 'D' = Nickel/Dime ' ' (space) = Not Applicable
6	1	MarketState	'N' = Normal Trading 'O' = Opening ' ' (space) = Not Applicable '*' (asterisk) = New value masked for backward compatibility. Upgrade to new version to see new values.
7	1	FreeTradingCondition	'1' = Regular , '2' = ABBOUncrossed, ' '(space) = Not Applicable '*' (asterisk) = New value masked for backward compatibility. Upgrade to new version to see new values.
8	6	RoutedOrderQty	Total Routed Away Quantity. Populated when the trade is executed at away exchange.

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Position	Number of Characters	Parameter Name	Description
			Format: Fixed length integer prepended with zero I.E. 000012
14	1	ContraTimeInForce	0 = DAY 3 = IOC (Immediate or Cancel) '*' (asterisk) = New value masked for backward compatibility. Upgrade to new version to see new values.
15	1	FIXLiquidityRole	Possible values: 'R' = Single Order 'Q' = QCC Agency Order 'Z' = QCC Contra Order '@' = Multileg Order 'F' = cQCC Agency Order 'G' = cQCC Contra Order 'A' = QFO Initiator Order 'B' = QFO Contra Order 'C' = cQFO Initiator Order 'D' = cQFO Contra Order 'H' = C2C Initiator Order 'I' = C2C Contra Order 'J' = cC2C Initiator Order 'K' = cC2C Contra Order '*' (asterisk) = downgraded for older version
16	1	ContraLiquidityType	Possible values: 'F' = FIX Order 'B' = Binary Order 'C' = Complex FIX Order 'E' = Complex Binary Order ' ' (space) = N/A (Not Applicable) (eg: Manual Trade) '*' (asterisk) = downgraded for older version
17	1	ContraFIXLiquidityRole	Possible values: 'R' = Single Order 'Q' = QCC Agency Order 'Z' = QCC Contra Order '@' = Multileg Order 'F' = cQCC Agency Order 'G' = cQCC Contra Order 'A' = QFO Initiator Order 'B' = QFO Contra Order 'C' = cQFO Initiator Order 'D' = cQFO Contra Order 'H' = C2C Initiator Order 'I' = C2C Contra Order

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Position	Number of Characters	Parameter Name	Description
			'J' = cC2C Initiator Order 'K' = cC2C Contra Order ' ' (space) = N/A (Not Applicable) (eg: Contra is a Binary Order) '*' (asterisk) = downgraded for older version

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Appendix B: Contact List

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

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Appendix C: Revision History

Revision Date	Version	Description
Jul 25th, 2023	1.0	First Release
Mar 25th, 2024	2.0	Floor Trading related changes.
Jan 08th, 2025	2.1	Replaced C2C and cC2C related single enum with 2 distinct enums in FIXLiquidityRole and Contra FIXLiquidityRole of AdditionalBillingParameters (Tag **9730),** which is used in ExecutionReport (MsgType = 8) and Trade Cancel/Correct (MsgType = UCC).
Aug 04th, 2026	2.1a	SecurityExchange: Added 'IEXO'(IEX Options) and 'MXTO'(MX2 Options)
Nov 16th, 2026	2.1b	Added configurable support for time format in SendingTime (tag 52), TransactTime (tag 60) and OrigSendingTime (tag 122) of outbound messages. For inbound messages, configuration is not required for the time fields. Firms can send time value in any of the three formats.

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