



ISE, GEMX, & MRX FIX Drop Specifications

VERSION 1.1.2

JULY 13, 2017

FIX DROP 1.1.2 (Nasdaq ISE/Nasdaq GEMX/Nasdaq MRX Options)

Table of Contents

1 Overview	2
2 Session Information	2
2.1 Logon	2
2.1.1 ID Fields	2
2.2 Sequence Numbers	2
2.3 Heartbeat	2
2.4 Test Request	3
2.5 Resend Request	3
2.6 Reject	3
2.7 Sequence Reset	3
2.8 Logout	3
3 Data Types	3
4 Fault Redundancy	3
5 Service Bureau Configuration	4
6 Standard Message Header	4
7 Standard Message Trailer	4
8 Outbound Sequenced Messages	4
8.1 Trade-Drop Copy	5
8.2 Order-Drop Copy	7
8.3 Execution Report	7
9 Notes	13
10 Support	13
11 Revision History	13

1 Overview

It is assumed that the reader is familiar with the FIX 4.2 protocol as described at <http://www.fixprotocol.org>. This document describes the differences between the Nasdaq implementation and the FIX 4.2 standard.

2 Session Information

2.1 Logon

The Logon must be the first message sent by the subscriber after the TCP connection is established. EncryptMethod is ignored (FIX level encryption is not supported). The IP Address of the subscriber, the SenderCompID and TargetCompID will be validated. If validation fails, the connection will be dropped.

2.1.1 ID Fields

SenderCompID sent	The SenderCompID as assigned by Nasdaq. The maximum size is 4 to 6 characters.
TargetCompID	The TargetCompID as assigned by Nasdaq. The maximum size is 4 to 6 characters.

If the connection is unexpectedly broken, upon reconnect the subscriber may receive a Logon Acknowledgement with a sequence number greater than expected. This means that in-flight messages were missed (likely important execution reports). The subscriber should issue a Resend Request to retrieve the missed messages.

Similarly, NASDAQ will issue a Resend Request to the subscriber for messages that it missed.

HeartbeatInterval must be specified by the subscriber in the Logon message in whole seconds. Though there are no restrictions imposed by NASDAQ on *HeartbeatInterval*, we recommend using a value as low as possible, so disconnects are detected sooner. The accepted *HeartbeatInterval* value will be returned on the Logon Acknowledgement message.

2.2 Sequence Numbers

Sequence numbers, both inbound and outbound, will be reset to 1 at the beginning of each session. Messages are processed sequentially. Sequenced messages that have fallen behind (other than Sequence Reset – Reset, Sequence Reset - GapFill and those marked with PossDup flag of 'Y') can cause an immediate logout. Sequence Reset – Reset attempting to reset the sequence to a new sequence number that is lower than current expected sequence will also cause an immediate logout. Messages with sequence numbers higher than expected (other than Logon and Logout) will trigger message recovery via Resend Request.

2.3 Heartbeat

A Heartbeat message should be sent if the agreed upon *HeartbeatInterval* has elapsed since the last message sent. If any message has been sent during the preceding *HeartbeatInterval* a Heartbeat message need not be sent.

2.4 Test Request

Nasdaq will reply with a Heartbeat message to a Test Request message, providing TestReqId as of original Test Request.

Nasdaq will issue a Test Request if a *HeartbeatInterval* + 1 seconds have elapsed since the last message received. If 3 consequent Nasdaq Test Requests go by without receiving a message the TCP connection is considered broken and will be dropped.

2.5 Resend Request

As discussed in the FIX 4.2 specification, it is possible to send an open or closed sequence range in a Resend Request (an open range uses sequence zero as the EndSeqNo). Nasdaq will honor either type of request. Any messages sent in response to Nasdaq Resend Request should have PossDup="Y".

2.6 Reject

Session level rejects are used to indicate violations of the session protocol, or missing (or invalid) fields. These are to be expected during development and certification, but should be extremely rare in production. Application layer rejects (like Order Reject and Cancel Reject) are normal.

2.7 Sequence Reset

Sequence Reset - Gap Fill (GapFillFlag = "Y") messages should conform to standard message sequencing rules, sequence numbers in the past will be ignored and treated as PossDup="Y".

Sequence Reset - Reset (GapFillFlag not "Y") is used only as a last resort, and always by human intervention, to allow an otherwise confused session to be resumed. In these cases, all chances at automatic message recovery are lost.

2.8 Logout

Either side may issue a Logout to gracefully close the session. The side that issues the Logout should process messages normally until it sees the Logout Acknowledgement, and then break the TCP connection. Nasdaq will typically only request Logout after the scheduled end of a FIX session.

3 Data Types

Nasdaq follows FIX standard for data types.

4 Fault Redundancy

A single FIX Drop account can be bound to multiple physical FIX Drop instances. These FIX Drop instances then provide "parallel" fix sessions for fault redundancy.

In this configuration, all instances are able to "drop" messages. Both incoming and outgoing sequencing will be maintained across all instances. However, subscriber will be allowed to maintain only one active

connection at a time. If the subscriber connects to one of the alternative instances when still connected on another instance, the old connection will be dropped and the new connection will be accepted.

5 Service Bureau Configuration

A DROP host can deliver information for one or more firms, allowing a service bureau configuration. In this case, the DROP account must be authorized by each desired firm using a DROP Port Authorization Form.

6 Standard Message Header

Message Header

Tag	Field Name	Req'd	Comments
8	BeginString	Y	FIX.4.2. Must be the first field in message.
9	BodyLength	Y	Must be second field in the message.
35	MsgType	Y	Must be the third field in the message.
34	MsgSeqNum	Y	
49	SenderCompID	Y	SenderCompID as assigned by NASDAQ.
56	TargetCompID	Y	TargetCompID as assigned by NASDAQ.
52	SendingTime	Y	Required by FIX but not validated by NASDAQ.
50	SenderSubID	N	Ignored. When sending execution report NASDAQ will send INET in this field.
57	TargetSubID	N	Ignored, When sending execution report NASDAQ will duplicate first 4 characters of Client Order Id in this field.
43	PossDupFlag	N	Should be present on retransmitted messages, whether prompted by the sending system or as the result of a resend request.
97	PossResend	N	Required when message may be duplicate of another message sent under a different sequence number.
122	OrigSendingTime	N	Required for message resends but not validated by NASDAQ.

7 Standard Message Trailer

Tag	Field Name	Req'd	Description
10	Checksum	Y	Modulo 256 checksum of all characters in message up to and including the delimiter preceding the CheckSum field. Three digits with leading zeroes if necessary.

8 Outbound Sequenced Messages

A drop copy session sends execution reports to interested parties (such as clearing members or sponsors) when:

- A trade occurs
- Order status changes
- A trade is modified or canceled

Drop copy services are offered in three versions:

- Trade-Drop Copy — trade reports, only
- Order-Drop Copy — order status and trade reports

Drop Copy Configurations

This section describes the available drop copy configurations, and highlights messaging and data differences between the drop copy interfaces, and between drop copy and order entry interfaces.

Drop copy sessions are one-way sessions. Execution reports are sent only from the exchange to the member. Except for FIX session-level messages, drop copy sessions do not support any application messages sent by the member.

Note, the following treatments applicable to Trade-Drop Copy, Order-Drop Copy and Execution Report Messages:

- **Manual trades** entered by market operations will result in the following fields being populated as described:
 - *CLOrdID* (Tag 11), *QuoteId*(117), *Price*(44), *OrderType*(40), *TimeInForce*(59), and all other order related tags will not be there.
 - *ExecType* (Tag 150) and *OrderStatus* (Tag 39) will be 0
 - *OrderQty*(38), *LeavesQty* (151), *CumQty*(14), *AvgPx*(6) will be 0
- **Trade Cancellations** will result in the following fields being populated as described:
 - *ExecTransType* (Tag 20) will be populated with 1
 - *ExecRefID* (Tag 19) will be populated with the reference ExecID
- **Successful Post Trade Allocation Request or corrections** will result in the following fields being populated as described:
 - Trade Cancel Message with:
 - *ExecTransType* (Tag 20) = '1'
 - *ExecRefID* (Tag 19) will be populated with the reference ExecID
 - *ExecType* (Tag 150) and *OrderStatus* (Tag 39) will be 0
 - New Trade Message with:
 - *ExecTransType* (Tag 20) = '0'
 - *ExecRefID* (Tag 19) will be populated with the reference ExecID
 - *ExecType* (Tag 150) and *OrderStatus* (Tag 39) will be 0

Please note, all the PTA, corrections and busts will be based on the trade and not the current order state.

8.1 Trade-Drop Copy

Any member that wishes to receive trade notices for any trade to which they are a party, regardless of how the order was entered, can use a trade-drop copy session.

Trade-drop copy is a stateless session. That is, no state information is reported or maintained about the order that generated the trade. Only trades (executions) are reported. All trades are reported in isolation for the quantity indicated with no calculations performed for remaining quantity, cumulative quantity, or average price – even if multiple executions for the same order occur consecutively.

Same-day trade cancels and corrections are reported, but corrections to previous days’ trades are not reported. Clearing changes initiated by the counter party side of a trade are not reported also.

The following table details *only* the differences between a “normal” execution report (as sent by FIX order routing port) and a trade-drop copy execution report.

Table 1: Trade-Drop Copy Report Message Format

Tag	Field name	Req	Comments
6	AvgPx	Y	0 (zero)
11	ClOrdID	Y	Unique order identifier (may not be unique for the drop session) Not guaranteed to be same as original order
14	CumQty	Y	0 (zero)
17	ExecID	Y	Internal Exec ID
20	ExecTransType	Y	0=New 1=Cancel
38	OrderQty	Y	0 (zero)
39	OrdStatus	Y	0=New
109	ClientID	N	Enabled by request only. Options give-up value if specified on order. Otherwise default give-up value is populated.
150	ExecType	Y	0=New
151	LeavesQty	Y	0 (zero)
204	CustomerOrFirm	Y	0=Customer 1=Proprietary — Firm 5=Far Market Maker Additional values can be enabled by request: 2=Broker/Dealer — Firm 3=Broker/Dealer — Customer 4=ISE Market Maker 6=Retail Customer 7=Proprietary — Customer 8=Customer Professional 9=JBO
9076	StockLegGiveUp	N	Enabled by request only. Stock leg give-up value if specified on order. Otherwise default give-up value is populated.

8.2 Order-Drop Copy

An order-drop copy session provides execution reports, including order acknowledgment (“new”), modifications, cancels, and trades.

Clearing changes initiated by the counter party side of a trade are not reported also.

The following table details *only* the differences between a “normal” execution report and an order-drop copy execution report.

Table 2: Order-Drop Copy Message Format

Tag	Field name	Req	Comments
11	ClOrdID	Y	Unique order identifier per incoming protocol connection (may not be unique for the drop session)
109	ClientID	Y	Stock or Options give-up value if specified on order. Otherwise default give-up value is populated.
797	CopyMsgIndicator	Y	“Y”
9076	StockLegGiveUp	N	Enabled by request only. Stock leg give-up value if specified on order. Otherwise default give-up value is populated.

8.3 Execution Report

The **Execution Report** message is used to:

- confirm the receipt of an order
- confirm changes to an existing order
- confirm cancelation of an existing order
- relay fill information on working orders
- report trade busts or other post-trade corrections

Regular orders are reported atomically.

Multi-leg orders are reported per leg, in any order. *SecurityType* (167) can be configured to report MLEG (default) for all legs, or CS and OPT (depending on the leg instrument type).

Regular crossing orders are reported per side, in any order.

Multi-leg crossing orders are reported per leg per side, in any order.

Fill or Kill orders (FOK) are represented with Tag 18 *ExecInst* = ‘G’=All Or None (AON) and Tag 59 *TimeInForce* = “IOC”

AvgPx (6) and *CumQty* (14), *DayCumQty*(425) and *DayAvgPx*(426), *LeavesQty* (251) will not be populated on execution messages resulting from busts or other post trade corrections.

Fields that simply carry-over from order messages will be as specified on the order, and are shaded in the table below. The following tags are supported on the **Execution Report** message:

Table 3: Execution Report Message Format

Tag	Field Name	Req	Comments
<Standard Header>		Y	MsgType = 8
1	Account	N	
6	AvgPx	N	Will be 0 for busts or other post-trade corrections
11	ClOrdID	N	Unique order identifier per incoming protocol connection (may not be unique for the drop session)
117	QuoteID	N	Identifier of the SQF quote/sweep being reported. If TIF = 3 (IOC) & this tag is present, it refers to a sweep-id sent by the client. If TIF = 0 (DAY) & this tag is present, it refers to a quote-id sent by the client. See notes for explanation how this tag will be decoded
14	CumQty	N	Will be 0 for busts or other post-trade corrections
17	ExecID	Y	Internal trade ID
18	ExecInst	N	1'=Not held (ALO, re-price [with '6']) '6'=Participate don't initiate (ALO, cancel) 'G'=All Or None (AON) 'H'=Reinstate on System Failure (Persist)* 'Q'=Cancel on System Failure (Do not persist)** 'f'=Intermarket Sweep Order (ISO)† 'h'=Do Not Route order (DNR)† * NON-STANDARD value (FIX ver. 4.3) ** NON-STANDARD value (FIX ver. 4.4) † NON-STANDARD value (FIX ver. 5.0)
19	ExecRefID	N	
20	ExecTransType	Y	0=New 1=Cancel 2=Correct

Tag	Field Name	Req	Comments
30	LastMkt	N	<p>For stock trades, market that executed the stock leg.</p> <p>1=BNY ConvergEx U.S. Transaction Services 3=BNY ConvergEx Millennium ATS 4=Knight Match 5=Knight Link 6=Instinet CBX (US) 7=Deutsche Bank ATS 8=Cheevers 9=Libucki 10=FOG Equities 12=Knight Capital Group (KCG)</p> <p>All values NON-STANDARD (ISE)</p> <p>For option linkage trades, away execution exchange:</p> <p>A = NYSE AMEX B = BOX C = CBOE E = EDGX H = GEMX I = ISE J = MRX M = Miami P = MIAX Pearl N = NYSE ARCA Q = NASDAQ T = NASDAQ BX W = C2 X = NASDAQ PHLX Z = BATS</p>
31	LastPx	N	
32	LastShares	N	
37	OrderID	Y	Unique ID assigned by exchange
38	OrderQty	Y	
39	OrdStatus	Y	0=New 1=Partially Filled 2=Filled 4=Canceled 5=Replaced 6=Pending Cancel E=Pending Replace
40	OrdTyp	N	
41	OrigClOrdID	N	
44	Price	N	
48	SecurityID	Y	
54	Side	Y	

Tag	Field Name	Req	Comments
55	Symbol	Y	
58	Text	N	
59	TimeInForce	N	
60	TransactTime	Y	Time of execution. YYYYMMDD-HH:MM:SS.sss (milliseconds)
76	ExecBroker	N	
77	OpenClose	Y	
99	StopPx	N	
100	ExDestination	N	Only present for QCC w/ Stock Order Sent only in ORDER mode (if user provided at order entry)
111	MaxFloor	N	
150	ExecType	Y	0=New 1=Partially Filled 2=Filled 4=Canceled 5=Replace 6=Pending Cancel E=Pending Replace
151	LeavesQty	Y	0, if OrdStatus is Canceled or Rejected, otherwise (OrderQty - CumQty)
167	SecurityType	Y	CS OPT MLEG (Configurable by request)
168	EffectiveTime	N	YYYYMMDD-HH:MM:SS.sss (milliseconds)
200	MaturityMonthYear	Y	
201	PutOrCall	Y	
202	StrikePrice	Y	
204	CustomerOrFirm	Y	
205	MaturityDay	N	
541	MaturityDate	Y	Month, Day and Year of the maturity. Format YYYYMMDD (e.g., 20100918 to represent Sept 18, 2010)
424	DayOrderQty	N	GTC/GTD orders only: DayOrderQty is the OrderQty minus the contracts that were traded on previous days.
425	DayCumQty	N	GTC/GTD orders only: The number of contracts that have traded today. Will be 0 for busts or other post-trade corrections

Tag	Field Name	Req	Comments
426	DayAvgPx	N	GTC/GTD orders only: The average price of contracts that have traded today. Will be 0 for busts or other post-trade corrections
439	ClearingFirm	N	CMTA
440	ClearingAccount	N	OCC sub-account
442	MultiLegReportingType	N	2=Individual leg of a multi-leg security 3=Multi-leg security
548	CrossID	N	
549	CrossType	N	
654	LegRefID	N	
797	CopyMsgIndicator	N	NON-STANDARD field (FIX ver. 4.4)
810	UnderlyingQty	N	Present only in QCC Order ER Sent only in ORDER mode (if user provided at order entry)
879	UnderlyingPrice	N	Present only in QCC Order ER Sent only in ORDER mode (if user provided at order entry)
109 2	PriceProtectionScope	N	
150 6	SideTradeID	N	Carried to OCC TrdID field NON-STANDARD field (FIX ver. 5.0SP2 EP107)
860 1	AuctionInst	N	
904 3	Stepup Price Type	N	Valid Values 1=Market 2=Limit (Only in ORDER Mode)
904 4	Stepup Price	N	(Only in ORDER Mode)
920 2	SpecialOrdType	N	
943 9	CounterpartyExecBrokerClearingFirm	N	Trade counter-party CMTA NON-STANDARD field (ISE) - DROP COPY ONLY
917 6	CounterpartyExecBroker	N	Trade counter-party clearing account NON-STANDARD field (ISE) – DROP COPY ONLY

Tag	Field Name	Req	Comments
9404	CounterpartyCustomerOrFirm	N	Trade counter-party client category 0=Customer 1=Prop - Firm 2=B/D - Firm 3=B/D - Customer 4=ISE MM 5=FARMM 7=Prop - Customer 8=Customer - Pro NON-STANDARD field (ISE)
9730	LiquidityIndicator	N	X=undefined M=Maker T=Taker H=Hidden O=Opening C=Cross R=Response 8=Flashed Order 9=Flash Response 10=Routed Out 11=Trade Report 12=Combo Maker Against Combo 13=Combo Taker Against Combo 14=Combo Response Against Combo 15=Combo Hidden Against Combo 16=Combo Opening Rotation 17=Combo Cross 18=Combo Taker Against Regular 19=Regular Maker Against Combo 20=Combo Taker Against IO 21=Regular Taker Against IO (incl. PIM) 22=IO Maker Against Combo 23=IO Maker Against Regular 24=Regular Maker Against IO Participant 25=IO Participant Taker Against Regular 26=Broken Price Improvement 27=Broken Facilitation 28=Broken Solicitation 29=Combo Broken Price Improvement 30=Combo Broken Facilitation 31=Combo Broken Solicitation 32=Block 33=Block Response 34=Directed Response 35=Facilitation 36=Facilitation Response

Tag	Field Name	Req	Comments
			37=Price Improvement 38=Price improvement Response 39=Solicitation 40=Solicitation Response 41=Qualified Contingent Cross 42=Customer to Customer 43=Combo Facilitation 44=Combo Facilitation Response 45=Combo Price Improvement 46=Combo Price Improvement Response 47=Combo Solicitation 48=Combo Solicitation Response 49=Combo Qualified Contingent Cross 50=Combo Customer to Customer 51=Sweep Routed Out 52=Sweep Trade Report NON-STANDARD field (ISE)
981 1	PriceDelta	N	Present only in QCC Order ER Sent only in ORDER mode (if user provided at order entry)
986 1	BranchSeqNbr	N	
	<Standard Trailer>	Y	

9 Notes

Quote/Sweep Id

o SQF Quote / Sweep message Ids are specified as binary strings. 8-byte binary SQF Ids are encoded as 16-byte ASCII strings where each byte of the SQF Id is represented by two 0-F ASCII characters, e.g. "5E" for 0x5e.

10 Support

If you have any questions or comments about this specification, email tradingservices@nasdaqomx.com. We welcome suggestions for new features or improvements.

11 Revision History

Revision #	Date	Change

1.0	09/13/16	Created a separate specification for FixDrops
1.1	11/18/16	<ul style="list-style-type: none"> • AvgPx (6), CumQty (14), DayCumQty(425) and DayAvgPx(426) will not be provided on busts or other post trade allocation changes • Fill or Kill order will have TimeInForce = IOC and ExeInst = AON • Adding QuoteID to Execution Report
1.1.1	1/7/17	<ul style="list-style-type: none"> • <i>LeavesQty (Tag 151) will not be populated on execution messages from busts or other PTA corrections</i> • Manual Trade, Trade Correct/Cancellation messaging details clarified • Adding MIAX Pearl enumeration as P to <i>LastMkt</i>
1.1.1	4/19/17	<ul style="list-style-type: none"> • Clarifying <i>Security Type</i> (Tag 167) is not configurable
1.1.2	7/14/17	<ul style="list-style-type: none"> • Adding clarifying <i>Security Type</i> (Tag 167) configurability • Adding following tags to Execution report to support QCC <ul style="list-style-type: none"> ○ <i>ExDestination</i> (100) ○ <i>UnderlyingQty</i> (810) ○ <i>UnderlyingPrice</i> (879) ○ <i>PriceDelta</i> (9811) ○ <i>Stepup Price Type</i> (9043) ○ <i>Step up Price</i> (9044) • Clarifying <i>OrderID</i> (37) will be sent on PTAs