Global OTC FIX Specification

Global OTC Platform (OTC Equity Securities)
UGW FIX Gateway

May 11, 2023
Version 5.1

Preface

Document Control

Date	Revision	Synopsis of Change
April 16, 2013	1.0	Initial Document
August 29th, 2013	1.1	Removed "Random Reserve" Order Type
March 26th, 2014	2.0	Changed Tag 47 name to Order Capacity Added note to Tag 47 that if no Tag 47 is sent on an order, the order will by default be marked with 47=P (Principal).
April 16, 2015	2.1	Added Tag 9534 (UnsolicitedFlag) to indicate whether an order is to be treated as solicited or unsolicited. **Reserved for future use. Changed product branding to "Global OTC UGW FIX Gateway" from "Global OTC CGW FIX Gateway" in support of customer migrations away from CGW and onto the Universal Gateway (UGW). Note that the FIX protocol remains unchanged in this migration.
April 26, 2016	3.0	Removed details for the following order types and modifiers: - Tracking Order - Passive Liquidity (PL) Order - Midpoint Passive Liquidity (MPL) Order - Discretionary Orders (inclusive of Discretionary Limit and Passive Discretionary) - "Auction Only" Market/Limit Orders - Midpoint Cross Order - PNP Cross Order - IOC Cross Order - Sweep Reserve Order
May 16, 2016	4.0	Updated details of Tag 9534 (UnsolicitedFlag) and Tag 9732 (AttributedQuote).
June 28, 2017	4.1	Removed support for PNP+ Orders (removed Tag 9417 ExtendedPNP).
August 25, 2017	4.2	Updated description of PNP Order.
March 8, 2018	4.3	Updated description of PNP Order.
May 2, 2019	4.4	Updated to remove Q orders
January 8, 2021	4.5	Updated descriptions of the following tags: - OrderQty (38) - CumQty (14) - LastShares (32) - OrderQty (38) - LeavesQty (151) Updated Appendix A: Liquidity Indicator Values - replaced Neutral (O) with Auction (O, G or Z).
March 5, 2021	4.6	Section 8: Global OTC Order Types - clarified that Inside Limit Order is only routable when specified with TIF=0.
September 22, 2021	4.7	Effective September 28, 2021: Updated description of tag UnsolicitedFlag (9534) and added this tag to Cancel/Replace Request and Execution Report.

July 19, 2022	4.8	Updated description of LocateReqd (114).
September 16, 2022	4.9	Updated description of LocateReqd (114).
November 9, 2022	5.0	Updates to account for nanosecond support.
May 11, 2023	5.1	Removed support for Fast Cancel/Replace.

Contents

1 Overview

1.1   About this Document

This document describes the implementation of the FIX 4.2 Protocol used by Global OTC. This document assumes the reader thoroughly understands the FIX 4.2 protocol available at http://www.fixprotocol.org/. This document is not intended as a guide to constructing a FIX client. Rather, it is a checklist to ensure that a firm's FIX client, constructed according to the FIX 4.2 specification, will be compatible with the Global OTC UGW FIX Gateway on the ambiguous details of the FIX specification.

1.2   About the Global OTC UGW FIX Gateway

The Global OTC UGW FIX Gateway strictly follows the FIX 4.2 standards. Firms utilizing FIX 4.2 systems should easily interface with the Global OTC UGW FIX Gateway.

As new features become available in future versions of the FIX protocol and are implemented in the Global OTC UGW FIX Gateway, Global OTC makes them available in all past FIX versions. As a result, any new fields introduced in FIX 4.3 and beyond that are supported by Global OTC can be available in FIX 4.2.

1.3   Global OTC FIX Certification

Global OTC offers a FIX gateway testing environment that can be used for certification and by clients to test changes made to their FIX engines. This environment supports most Global OTC specialized order types and is available daily from 4:00 AM EST to 8:00 PM EST. Please send an email to connectivity@globalotc.com to obtain the appropriate connectivity information.

Other Contacts

The Global OTC Market Support teams have a centralized phone number. Through this number, clients are able to reach all support contacts for Trading, Technical, Market Data and Client Relationship Services.

+1 212-896-2830

Follow the prompts for menu options.

2 System Architecture

Each client sends orders to their assigned session and port on the Global OTC UGW FIX Gateway. The Global OTC UGW FIX Gateway then routes the order to the appropriate destination.

```
┌──────────────┐
│   FIRM A     │────────┐
│   FIX 4.2    │         ╲
└──────────────┘          ╲
                           ▼
┌──────────────┐     ┌─────────────────┐        ┌──────────────────────┐
│   FIRM B     │────▶│   Global OTC    │────────│     Global OTC       │
│   FIX 4.2    │     │  FIX Gateways   │        │ (OTC Equity Securities)│
└──────────────┘     └─────────────────┘        └──────────────────────┘
                           ▲
┌──────────────┐          ╱
│   FIRM C     │────────┘
│   FIX 4.2    │
└──────────────┘
```
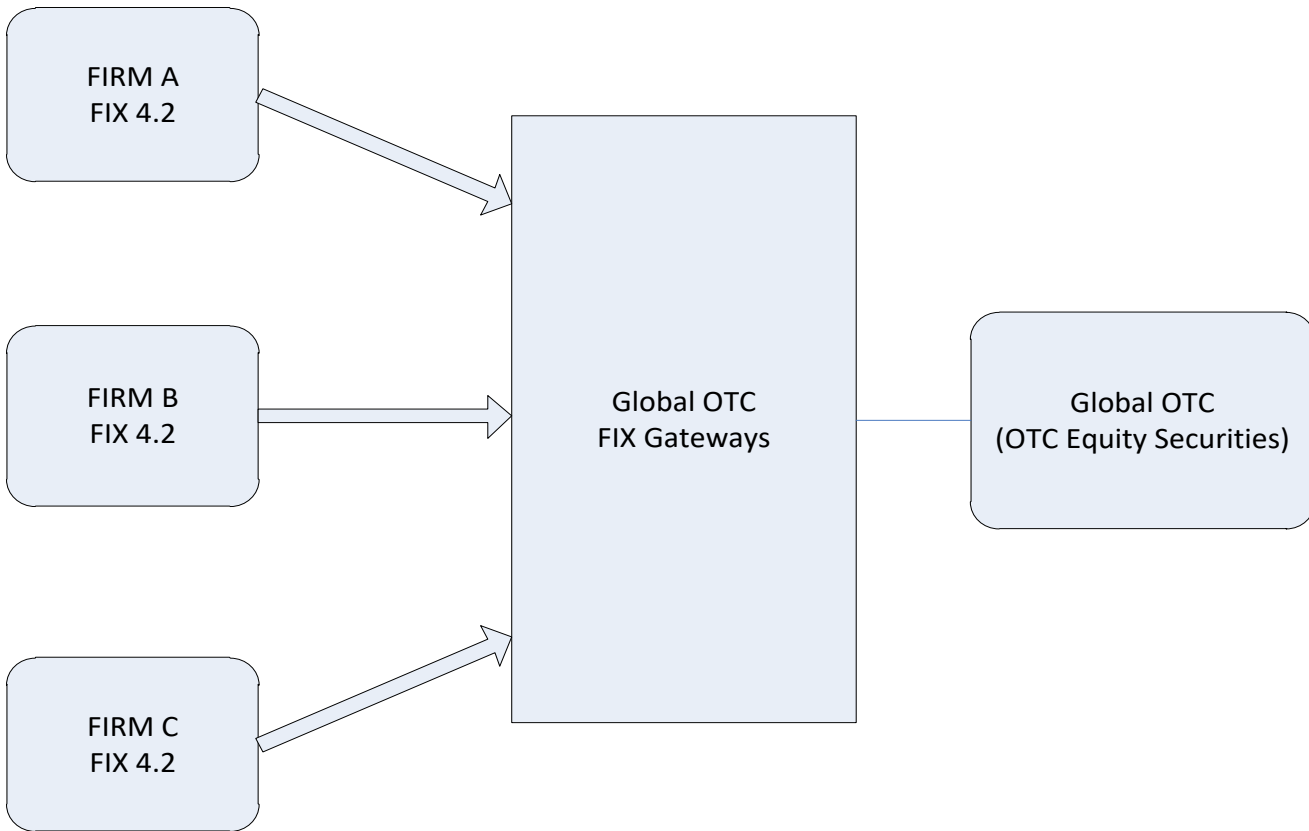
3   Global OTC Information

3.1   Decimalization

For all securities trading below $1.00, Users will be able to submit orders in price increments of up to four decimal places. Global OTC will also route to away market centers in price increments of up to four decimal places.

Opening/Closing Auctions:
- Opening and Closing Auctions may occur in sub-penny increments.
- Any imbalance after the Opening Auction will be released into the market for core trading.

The following order types may not utilize sub-penny prices:
- Offsets of any type of less than $0.01.

3.2   Hours of Operation

Hours of Operation for Global OTC Platform

- Opening limit Auction – We start accepting orders for the auction at 3:30AM, limit order auction runs at 8:00AM
- Session 1 (Opening Session) – 8:00AM – 9:30AM
- Market Order Auction – 9:30AM
- Session 2 (Core Session) – 9:30AM – 4:00PM
- Session 3 (Late Session) – 4:00PM – 4:15PM

3.3   Trading Session ID

Firms have several options in identifying the TimeInForce parameters, it is highly recommended that firms using a combination of TradingSessionID values to specify the sessions for which participation is desired.

Orders may be entered at any time after 3:30 AM.

Session 1 (TradingSessionID value "P1") orders participate in:

- Opening Auction
- Session 1 (Opening Session)
- Limit Order Auction
- Expire at 9:30 AM

Session 2 (TradingSessionID value "P2") orders participate in:

- Market Order Auction
- Session 2 (Core Session)
- Expire at 4:00 PM

Session 3 (TradingSessionID value "P3") orders participate in:

- Session 3 (Late Session)
- Expire at 4:15 PM

FIX Format of Trading Sessions:

386=1 | 336=P1 (Early Session)
386=1 | 336=P2 (Core Session)
386=1 | 336=P3 (Late Session)
386=2 | 336=P1 | 336=P2 (Early and Core Sessions)
386=2 | 336=P2 | 336=P3 (Core and Late Sessions)
386=3 | 336=P1 | 336=P2 | 336=P3 (All three trading sessions)

TradingSessionID may be combined with a DAY order to provide accurate control of order execution. Combinations of TradingSessionID values may be used. For example, a DAY order might be specified with TradingSessionID values of "P1" "P2" and "P3".

DAY orders with no TradingSessionID qualifiers or other factors such as EffectiveTime default to being valid for Sessions 1 and 2 if placed between 3:30 AM and 4:00 PM, or will be rejected in the afterhours session.

3.4   Auction Orders

The schedule for these auctions is listed below:

- **Early Limit Order Auction – 8:00 AM EST**
- **Opening Market & Limit Order Auction – 9:30 AM EST**
- **Closing Market & Limit Order Auction – 4:00 PM EST**

Please note that there will be a freeze one minute before each auction. Orders cannot be cancelled during this time, and new orders that increase the imbalance will be rejected.

Market on Open (MOO)/Limit On Open (LOO) Orders

MOO/LOO orders participate in the opening auction only. Any quantity not executed in the opening auction will be immediately cancelled back to the client.

Market On Open (MOO) Order	OrdType (40) = 1 (Market) Timeinforce (59) = 2	A market order that is to be executed only during the opening auction.	Global OTC
Limit On Open (LOO) Order	OrdType (40) =2 (Limit) TimeInForce (59) = 2	A limit order that is to be executed only during the opening auction.	Global OTC

Closing Auction

To place an order in the late auctions, specify OrdType(40)=5 (Market on close) or OrdType(40)=B (Limit on close). Using these tags will indicate that an order is to participate ONLY in the appropriate auction and expire if not filled. Any straight limit order placed before the limit order auctions will participate and stay live if not executed. Any straight market order placed before the early market order auction will participate and stay live if not executed. Market orders are not valid after the late market order auction.

3.5   Self Trade Prevention Information

Four Self-Trade Prevention (STP) modifiers are available to Global OTC users. The STP modifiers allow firms to prevent two orders with the same MPID from executing against each other. Global OTC Subscribers may elect to add the STP modifiers to orders at the MPID level.

STP Cancel Newest (STPN)

An incoming order marked with the STPN modifier will not execute against opposite side resting interest marked with any of the STP modifiers from the same MPID. The incoming order marked with the STPN modifier will be cancelled back to the originating MPID. The resting order, which otherwise would have interacted with the incoming order by the same MPID, will remain on the Global OTC Book.

STP Cancel Oldest (STPO)
An incoming order marked with the STPO modifier will not execute against opposite side resting interest marked with any of the STP modifiers from the same MPID. The resting order, which otherwise would have interacted with the incoming order by the same MPID, will be cancelled back to the originating MPID. The incoming order marked with the STPO modifier will remain on the Global OTC Book.

STP Decrement and Cancel (STPD)
An incoming order marked with the STPD modifier will not execute against opposite side resting interest marked with any of the STP modifiers from the same MPID. If both orders are equivalent in size, both orders will be cancelled back to the originating MPIDs. If the orders are not equivalent in size, the equivalent size will be cancelled back to the originating MPIDs and the larger order will be decremented by the size of the smaller order with the balance remaining on the Global OTC Book.

STP Cancel Both (STPC)
An incoming order marked with the STPC modifier will not execute against opposite side resting interest marked with any of the STP modifiers from the same MPID. The entire size of both orders will be cancelled back to originating MPID.

General Notes
- STP modifiers are intended to prevent interaction between the same MPID.
- STP modifiers must be present on both the buy and the sell order in order to prevent a trade from occurring and to effect a cancel instruction.
- An incoming STP order cannot cancel through resting orders that have price and/or time priority.
- When an order with an STP modifier is entered it will first interact with all available interest in accordance with the Order Ranking and Display process.
- If there is a remaining balance on the order after trading with all orders with higher priority, it may then interact with an opposite side STP order.
- In situations where there are multiple STP orders resting in the Global OTC Book, an incoming STP order will only interact with the first resting STP order that it encounters.
- Incoming STP orders that are priced through the price of a resting STP order may cancel the resting order as long as no other non-STP orders have priority. Additionally, orders marked with one of the STP modifiers will not be prevented from interacting during any Auction process.

3.6   ISO Attribute
- An attribute that when added to an order will cause it to ignore away markets.   Subscribers shall remain responsible for their compliance with all aspects of the Regulation NMS-Principled Rules as set forth in FINRA Regulatory Notice 10-42, including routing to away markets, as necessary.

4   Global OTC Custom FIX Fields

4.1   Global OTC Defined FIX Fields

The following FIX fields have been added or created due to client demand. They are used to assist clients in trade reconciliation and also for billing purposes.

LastMkt (Tag 30)

The FIX LastMkt field will be specified on execution reports containing trades.

Values for this field: BB – Global OTC
The client may need this field for back office clearing and reporting purposes.

ExecBroker Field (Tag 76)

The FIX ExecBroker field can be specified on execution reports containing trades for Global OTC. This will contain the MPID (The Global OTC Subscriber Identifier) of the clientclient submitting the order for execution. This is a configurable setting that is turned on at the request of the clientclient (ExecBroker only appears on executions done on Global OTC). If you wish to receive this tag on Execution Reports, you will need to send an e-mail to connectivity@globalotc.com requesting this feature be turned on each of your session(s).

Liquidity Indicator (Tag 9730)

The Liquidity indicator is a proprietary FIX field sent on execution reports by Global OTC to indicate what effect an order has had on the liquidity of the book. Client's rates are determined by whether an order adds or removes liquidity from the book. The LiquidityIndicator is FIX Tag 9730 and is registered at fixprotocol.org. Appendix A in this specification contains all the definitions and values for this Tag. If you wish to receive this tag on Execution Reports, you will need to send an e-mail to connectivity@globalotc.com requesting this feature be turned on each of your session(s).

ArcaExID (Tag 9731)

This proprietary tag (9731) is populated by a numeric ID that is generated by Global OTC. Global OTC will provide a numeric ID when order is traded but the ID will be different for Buy and Sell orders.

For the Buy order execution, the ArcaExID will have the deal ExecID + *BUY EXECID OFFSET.*
For the Sell order execution, the ArcaExID will have the deal ExecID + *SELL EXECID OFFSET*.
For external executions, the ArcaExID will be populated from ExecID in the execution report sent from the away market.

If you wish to receive this tag on Execution Reports, you will need to send an e-mail to connectivity@globalotc.com requesting this feature be turned on for each of your session(s).

Attributed Quote Indicator (Tag 9732)

This proprietary tag (9732) is set to Y. The attributed quote in the XDP market data feed will show the MPID of the sender.

Proactive If Locked Indicator (Tag 9733)

This proprietary tag (9733) is set by the client to Y on limit orders to indicate that an order should route outbound if Global OTC is locked by an away marketplace. A client can also request this to be enabled by default on a FIX session, where all limit orders will by default be appended with 9733=Y.

5   FIX Session Settings and Messaging

5.1   Auto Cancel on Disconnect

At the client's request, a FIX session can be configured to automatically cancel all live or orders when your firm disconnects. Please note that this feature does not guarantee that all outstanding orders will be successfully canceled. It is possible that trades may happen near the time your firm disconnects, and such trades will not be reported to you. Likewise, a cancel request may fail due to system problems at Global OTC, and orders may remain live and subject to execution.

This feature is intended to help your firm in emergency situations. **Firms must not rely upon this automatic cancellation as a normal business practice or to prevent liability of execution. This feature is also not a substitute for contacting the applicable trade desks to verify that all orders are indeed canceled and that the firm has received all trades.**

5.2   Logon Session Profile

For the Global OTC UGW FIX Gateway, a client feature profile has been added utilizing Tags 95 and 96 to the Logon Message. Utilizing this profile, you can enable and disable session cancel on disconnect, tags and messages to be sent back on the order entry session. You can also enable/disable certain tags to be defaulted on orders through the session. Below is an explanation and details of each setting and value.

Tag	Position	Description	Values
95	N/A	Number of Feature Position Fields to Read	1 – 8
96	1	Cancel On Disconnect	0 - Do not enable Cancel On Disconnect for the session 1 - Enable Cancel On Disconnect for the session
	2	Send Busts and Correct Messages	0 - Do not enable Bust and Correct messages for the session 1 - Enable Bust and Correct messages for the session
	3	Send Liquidity Indicator	0 -Do not enable Tag 9730 to be sent on executions for the session 1 - Enable Tag 9730 to be sent on executions for the session
	4	Send ArcaExID	0 -Do not enable Tag 9731 to be sent on Executions for the session 1 - Enable Tag 9731 to be sent on Executions for the session
	5	Default ExtendedExecinst (Tag 9416) on New Order Messages	0 -No Interaction with Midpoint Passive Liquidity Orders 2 - No interaction with IOI Cloud A - Add Liquidity Only Z – Do Not enable Default of 9416 (ExtendedExecInst) Note: If a value is enabled here for default and you send in another value in Tag 9416 on a New Order, the value you sent in Tag 9416 will override this setting for that order and pass that value to the Matching Engines.
	6	Send ExecBroker	0 -Do not enable Tag 76 to be sent on Executions (Partial Fills/Fills) for the session 1 - Enable Tag 76 to be sent on Executions (Partial Fills/Fills) for the session
	7	Default ProactiveIfLocked (Tag 9733) on New Order Messages	0 – Do not default Tag 9733 on New Order Messages 1 - Default Tag 9733 to Y on New Order Messages A - Default Tag 9733 to 1 on New Order Messages B - Default Tag 9733 to 2 on New Order Messages
	8	Send Time Stamps in Tags 52/60	0 - (Default value) - Seconds 1 - Microseconds

Tag	Position	Description	Values
			2 - Milliseconds
			3 - Nanoseconds

Tag 95 - # of Positions								
Feature Profile (96)	Cancel On Disconnect	Send Busts and Corrects	Send Tag 9730 Liquidity Indicator	Send Tag 9731 DBExecID	Default Tag 9416 Extended ExecInst	Send Tag 76 ExecBroker	Default Tag 9733 Proactive if locked	Send Time Stamps in Tags 52/60
Values	0 or 1	0 or 1	0 or 1	0 or 1	0, 2, A, Z	0 or 1	0, 1, A, B	0 or 1
Tag 95	1							
Tag 96	0 or 1	0 or 1	0 or 1	0 or 1	0, 2, A, Z	0 or 1	0, 1, A, B	0 or 1
Tag 95	2							
Tag 96	0 or 1	0 or 1	0 or 1	0 or 1	0, 2, A, Z	0 or 1	0, 1, A, B	0 or 1
Tag 95	3							
Tag 96	0 or 1	0 or 1	0 or 1	0 or 1	0, 2, A, Z	0 or 1	0, 1, A, B	0 or 1
Tag 95	4							
Tag 96	0 or 1	0 or 1	0 or 1	0 or 1	0, 2, A, Z	0 or 1	0, 1, A, B	0 or 1
Tag 95	5							
Tag 96	0 or 1	0 or 1	0 or 1	0 or 1	0, 2, A, Z	0 or 1	0, 1, A, B	0 or 1
Tag 95	6							
Tag 96	0 or 1	0 or 1	0 or 1	0 or 1	0, 2, A, Z	0 or 1	0, 1, A, B	0 or 1
Tag 95	7							
Tag 96	0 or 1	0 or 1	0 or 1	0 or 1	0, 2, A, Z	0 or 1	0, 1, A, B	0 or 1
Tag 95	8							
Tag 96	0 or 1	0 or 1	0 or 1	0 or 1	0, 2, A, Z	0 or 1	0, 1, A, B	0, 1, 2, 3

As new features are added, they will be appended to the end of the profile in new positions.

If Logon Profile is not used, the following default settings will apply:

Feature	Default
Cancel On Disconnect	0 - Do not enable Cancel On Disconnect for the session
Send Busts and Correct Messages	1 - Enable Bust and Correct messages for the session
Send Liquidity Indicator	1 - Enable Tag 9730 to be sent on executions for the session
Send ArcaExID	0 - Do not enable Tag 9731 to be sent on Executions for the session
Default ExtendedExecinst (Tag 9416) on New Order Messages	Z - Do Not enable Default of 9416 (ExtendedExecInst)
Send ExecBroker	0 - Do not enable Tag 76 to be sent on Executions (Partial Fills/Fills) for the session
Default ProactiveIfLocked (Tag 9733) on New Order Messages	0 - Do not default Tag 9733 on New Order Messages
Send Time Stamps in Tags 52/60	0 - Time Stamp granularity in seconds. YYYYMMDD-HH-MM-SS

Or if Profile positions are not utilized, the default value applies to that position.

Examples:

Only Enable/Disable Cancel On Disconnect is selected on Logon Message:

95=1
96=1 (Cancel on Disconnect Enabled)

Default Value would apply to the other positions:

Feature	Default
Send Busts and Correct Messages	1 - Enable Bust and Correct messages for the session
Send Liquidity Indicator	1 - Enable Tag 9730 to be sent on executions for the session
Send ArcaExID	0 - Do not enable Tag 9731 to be sent on Executions for the session
Default ExtendedExecinst (Tag 9416) on New Order Messages	Z - Do not enable Default of 9416 (ExtendedExecInst)
Send ExecBroker	0 - Do not enable Tag 76 to be sent on Executions (Partial Fills/Fills) for the session
Default ProactiveIfLocked (Tag 9733) on New Order Messages	0 - Do not default Tag 9733 on New Order Messages
Send Time Stamps in Tags 52/60	0 - Time Stamp granularity in seconds. YYYYMMDD-HH-MM-SS

Enable/Disable Cancel On Disconnect, Send Busts and Corrects, Send Liquidity Indicator, and Send ArcaExID is selected on Logon Message:

95=4
96=1111 (Cancel on Disconnect, Busts and Corrects, Liquidity Indicator, ArcaExID all enabled)

Default Value would apply to the other positions:

Feature	Default
Default ExtendedExecinst (Tag 9416) on New Order Messages	Z - Do Not enable Default of 9416 (ExtendedExecInst)
Send ExecBroker	0 - Do not enable Tag 76 to be sent on Executions (Partial Fills/Fills) for the session
Default ProactiveIfLocked (Tag 9733) on New Order Messages	0 - Do not default Tag 9733 on New Order Messages
Send Time Stamps in Tags 52/60	0 - Time Stamp granularity in seconds. YYYYMMDD-HH-MM-SS

Cancel On Disconnect, Send Busts and Corrects, Send Liquidity Indicator, Send ArcaExID, Default Proactive If Locked = Y, Send Microsecond Time Stamps on Execution Reports are enabled on Logon Message:

95=8
96= 1111Z011

No Default settings apply in this scenario:

Feature	Default
No default features apply	Customer provided value for all feature positions

5.3   Trade Bust and Trade Correct Messaging

If or when the Global OTC Trade Desk changes or busts a trade, "Trade Break" or "Trade Correction" execution report messages can be sent outbound to the client via FIX. These messages will be defined in FIX with ExecTransType (20) =1 (Cancel) or 2 (Correct).

If you wish to receive electronic busts/corrects, you will need to send an e-mail to connectivity@globalotc.com requesting this feature be enabled on your session(s).

5.4   Bulk Cancel Message

If you want to bulk cancel your orders without disconnecting your FIX connection(s) we offer a bulk cancel message. The bulk cancel message is MsgType = F with the OrderID (37) field set to -999. We offer the following bulk cancel option:

- Cancel all orders for a particular symbol – If you want to cancel all orders for a particular symbol they you can add the symbol to the bulk cancel message.

When Global OTC receives a bulk message it will deliver a bulk cancel ack message followed by out messages for each of the orders that are canceled. If your orders have been routed to other away destinations we will ack them separately as it may take longer to receive the out messages from the away destinations.

5.5   FIX Session Throttle

This type of order gateway has a throttle limit of 1000 total inbound messages read per second for each configured client order session. The Enforced Message Rate Limitation is to ensure a session provides more predictable performance, while also preventing it from affecting the performance of other sessions on the same gateway.

Processing:

After the 1000th message is received within a rolling 1 second, any subsequent message is buffered until that second is completed. The application then sequentially processes queued messages, carrying over to further seconds every additional 1000 messages in the buffer. In this manner; if 5001 messages are sent to the port in under a second, the last one will not be processed by the gateway until the 5th second.

Outbound message rate from the gateway is not inhibited.

Recommendation:

It is recommended that firms monitor their exchange-bound message rate for a session, and adjust their order flow to utilize other sessions if this limit is frequently approached.

6   Session Protocol

This section discusses issues pertaining to the FIX Session Protocol, which is responsible for providing reliable, ordered transport of FIX Application messages.

All messages sent by your firm must have one SenderCompID and TargetCompID that is agreed upon in advance with Global OTC, and a TargetSubID of "ARCA".

Only the following FIX Session MsgTypes may be sent to the Global OTC UGW FIX Gateway:

- Sequence Reset
- Logon
- Logout
- Heartbeat
- Test Request
- Resend Request
- Reject

6.1   Sequencing and Reconnecting

In the event of a network or FIX gateway host failure during the day, Global OTC does provide backup sessions under the same SenderCompID on alternative FIX gateways at client request. Please note that these backup sessions are totally independent and will need to be connected to with inbound and outbound sequence numbers equal to 1. These sessions will not check orders sent as PossDupFlag=Y against orders sent previously on other FIX sessions with the same SenderCompID. These orders will be processed normally.

Global OTC staff will not modify the incoming and outgoing sequence numbers of your live FIX sessions. If you need to reset the sequence numbers on your session, setting ResetSeqNumFlag (Tag 141) to Y upon Login will accomplish this.

Please use caution when forcing a sequence number change as sequence mismatch scenarios typically indicate a serious problem. Coordination with members of the Global OTC Connectivity group is always recommended.

6.2   Logon

The logon message must be the first message you send after establishing a TCP connection on the port agreed upon with Global OTC. EncryptMethod must be 0 – None, or 5 – PGP/DES-MD5, as agreed upon with Global OTC. Your firm must wait for a Logon from Global OTC before sending other messages and beginning gap fill operations.

If your firm disconnects during the trading day and reconnects again, the logon you will receive in reply may have a sequence number greater than expected. It is critical that your firm detects this condition and issues a Resend Request to retrieve any missed Executions.

Your firm must specify a heartbeat interval in the Logon message, which the Global OTC UGW FIX Gateway will use to determine if the connection is active. The heartbeat information is documented in the Heartbeat and Test Request section.

6.3   Logout

It is your firm's responsibility to log out at the end of each day before midnight Eastern Time. You must verify, **prior to logout**, that there are no live or pending orders, otherwise your firm may miss trade reports.

The party initiating the logout must be the party that breaks the TCP connection to Global OTC. This requirement allows for both sides to issue a Resend Request should the logout or its reply arrive with a sequence gap. If you receive a logout with a sequence gap, as per the protocol specification, issue a Resend Request and then your own logout.

6.4   Heartbeat and Test Request

The Global OTC Host will use the heartbeat interval specified by the client in the Logon message to determine if the client is alive and the networks connecting your firm to Global OTC are functional. A value of 0 will disable this check, and the Global OTC Host will not send test requests nor break the connection if the client becomes idle. We recommend a heartbeat interval of 30 seconds. A value too small will waste bandwidth, and a value too large will defeat the purpose of the heartbeat. After HeartBtInt + 2 seconds of inactivity, the Global OTC Host will send a Test Request to determine if the firm is still active. After 2 * HeartBtInt + 4 seconds of inactivity, the Global OTC Host will send a logout and immediately drop the connection. Global OTC expects that your firm will use a similar method to determine if the Global OTC Host is active.

6.5   Resend Request

If your firm receives a Resend Request with a sequence gap, it is critical that you resend the appropriate messages first before sending your own Resend Request.

The FIX protocol specification defines two methods to recover from gaps in messages. One method, should your firm receive messages 1-10, then 15, would be to request 11-14 and then process 15. We recommend against this method because it can cause certain race conditions that increase recovery time. Instead, we recommend that your firm discard message 15, and request messages 11-999999. Global OTC will resend all messages with sequence numbers greater than or equal to 11. Note that this circumstance refers to the general case; the FIX protocol specification outlines more specific recovery behavior for certain out of sequence Administrative messages.

6.6   Reject

We recommend that your firm use the Reject message as sparingly as possible. As per the FIX specification, any message your firm rejects will not be resent. Your firm should keep a record of which messages the FIX Host rejects, and never resend them.

We will send a reject (Msgtype=3) in the event that a client has sent a properly formatted message, but a data field (price for example) is not populated with a proper value.

6.7   Sequence Reset

It is required that a Sequence Reset – Gap Fill occurs in sequence. For instance, if resending 10-15, and 11-14 are Administrative messages other than Reject, the client should resend 10, then 11 should be a Sequence Reset – Gap Fill, with a NewSeqNum of 15, and then resend 15. As per the specification, all messages in answer to a Resend Request must be flagged Poss Dupe. We interpret this part of the specification to mean that the Sequence Reset – Gap Fill itself must be flagged Poss Dupe as well.

A Sequence Reset – Gap Fill is the preferred method for handling errors. Global OTC will never send a Sequence Reset – Reset automatically. It is only sent by manual intervention, possibly to stop an endless loop of Resend Requests and resends, and we recommend that your firm do the same. We make no attempt to recover skipped messages when we receive a Sequence Reset – Reset, which is advantageous to breaking out of an infinite resend loop.

7 FIX Application Protocol

This section describes some of the FIX Application messages. It is not a complete reference and should be used in conjunction with the FIX protocol specification. Below is a quick legend to the Message tables that follow:

Tag	Field	Description	Req.	Values
Tag #	*Field Name*	*Field Description*	*Y = Required* *Y © = Required Conditionally* *N = Not Required* *C = Conditional*	*Valid Values for Field*

7.1 New Order – Single

Tag	Field	Description	Req.	Values
	Standard Header		*Y*	*MsgType = D*
1	Account	If this field is present, we copy the information into execution messages referring to this order. This field can be used for clearing information.	N	Agreed upon clearing value
11	ClOrdID	This field contains the ID assigned to the order by the firm. This value must be ≤ 30 characters. It is critical that this ID is unique for all orders sent today.	Y	Client Defined ≤30 characters
18	ExecInst	Used to specify values for different order types.	N	1=Not Held (Now orders only) 6=PNP f 6 (f *space* 6) = ISO
38	OrderQty	Indicates share quantity on order.	Y	Share prices > $0.01, 1-1,000,000 < $0.01, 1-10,000,000
40	OrdType	Indicates order type.	Y	1=Market 2=Limit 5=MOC 7=Inside Limit B=LOC
44	Price	Indicates price on order in decimals.	Y	.0001-999999.99 (Limit order only)
47	Order Capacity	Indicates capacity on order.	Y	A = Agency P = Principal R = Riskless Principal Note: If no Tag 47 is sent with an order, by default it will be marked with 47=P (Principal).
50	SenderSubID	This field, if present, will be copied into the TargetSubID field of all messages referring to the order. Your firm must not embed dates, time stamps, or order IDs in this field, as doing so will make aggregation of orders for troubleshooting purposes impossible.	*Y ©*	Required for Subscibers that have filed a Form 211 – this value will be agreed upon between Global OTC and client (MPID).
52	SendingTime	This value must be within 60 seconds of the current time, or we will reject the order.	Y	Time in UTC format. YYYYMMDD-HH:MM:SS

Tag	Field	Description	Req.	Values
54	Side	Only Buy, Sell, Sell Short, and in some cases, Cross and Cross Short.	Y	1=Buy 2=Sell 5=Sell Short 8=Cross 9=Cross Short
55	Symbol	This field must contain a valid symbol in upper case lettering.	Y	Valid Equities Ticker Symbol
57	TargetSubID	This field is required. The value must be "ARCA" for production. All messages referring to the order will have the SenderSubID set to this value.	Y	ARCA
59	TimeInForce	If a value is not present in this field, the default is Day.	N	0 = Day 2 = At the Opening 3 = IOC 4 = FOK
97	PossResend	An order sent with PossResend set is checked to see if it matches an existing order with the same ClOrdID. If not, it is treated as a new order. If it is a duplicate, we will ignore the message if the order is on file.	N	Y
111	MaxFloor	Used for reserve orders.	N	≥ 100
114	LocateReqd	Required to be N or Absent for sell short orders. Orders with this tag absent will be treated in the same manner as if it was included with value "N". Orders with "Y" value will be rejected.	N	N = No Null/Absent = Will be treated same as "N" value
115	OnBehalfOfCompID	This field normally is ignored, although can be used for clearing information.	N	Agreed upon clearing value
211	PegDifference		N	-9999.99-9999.99
336	TradingSessionID (NOTE: REPEATING GROUP!)	Indicates trading session order is designated for.	N	P1=Pre Open P2=Core P3=Post Market
386	NoTradingSessions	The number of instances of TradingSessionID values following.	N	1-3 (Must come before 336 Tag(s))
7928	NoSelfTrade	If used will prevent the order from trading against another order from the same MPID	N	N = Cancel Newest O = Cancel Oldest C = Cancel Both D = Decrement
8020	Display Range	Used for Random Reserve orders to indicate the display range	N	0-999,999
9416	ExtendedExecInst	To indicate for the order to Add Liquidity Only to the Global OTC Book.	N	A = Add Liquidity Only
9534	UnsolicitedFlag	Indicates whether the order represents unsolicited customer interest and that such order is not from, or on behalf of, a company insider or affiliate of the issuer.	N	N (or blank, or not sent) = Solicited Y = Unsolicited

Tag	Field	Description	Req.	Values
9732	AttributedQuote	All orders will be set to Y to indicate that the customer's MPID will be distributed through the Global OTC quote feed.	N	Y = Attributed
9733	ProactiveIfLocked	Set to Y on a Limit order for to indicate that an order should route outbound if Global OTC is locked by an away marketplace.	N	Y = Proactive if Locked
	Standard Footer		*Y*	

7.2   Order Cancel Request

In addition to requirements for the standard FIX message header, only the following fields are used by the application layer for an Order Cancel Request. Any other fields specified in the message are ignored.

Tag	Field	Description	Req.	Values
	Standard Header		*Y*	*MsgType = F*
1	Account	Used on MPID Bulk Cancel Only.	N	Client MPID
11	ClOrdID	This field contains the ID assigned to the change by your firm. This value must be ≤ 49 characters. It is critical that this ID is unique for all orders and changes sent today, as well as any orders or changes that may be active from previous days.	Y	User specified up to 30 characters
18	ExecInst	If sent, this value must match the original order.	N	1=Not Held 6=PNP f 6 (f *space* 6) = ISO
37	OrderID	If present, the value must exactly match the OrderID Global OTC assigns to the order.	N	Numerical up to 20 characters
38	OrderQty	If sent, this value must match the original order.	N	Share prices > $0.01, 1-1,000,000 < $0.01, 1-10,000,000
40	OrdType	If sent, this value must match the original order.	N	1=Market 2=Limit 5=MOC (Market On Close) 7=Inside Limit B=LOC (Limit on Close)
41	OrigClOrdID	This value must match the ClOrdID of the order or replaced order being cancelled. This value is the ClOrdID of the most current successful change. If the order was not changed or replaced, then this will be the ClOrdID of the original order.	Y	User specified up to 30 characters
44	Price	If sent, this value must match the original order.	N	.0001-999999.99

Tag	Field	Description	Req.	Values
47	Rule80A	If sent, this value must match the original order.	N	A = Agency P = Principal R = Riskless Principal
52	SendingTime	This value must be within 60 seconds of the current time, or we will reject the order.	Y	Time specified in UTC time. YYYYMMDD-HH-MM-SS
54	Side	If sent, this value must match the original order.	N	1=Buy 2=Sell 5=Sell Short 8=Cross 9=Cross Short
55	Symbol	This value must match the original order.	Y	Valid Symbol
59	TimeInForce	If sent, this value must match the original order.	N	0=Day 2=At the Opening 3=IOC 4=FOK
97	PossResend	A change request sent with PossResend set is checked to see if it matches an existing order with the same ClOrdID.	N	Y
111	MaxFloor	If sent, this value must match the original order.	N	≥ 100
211	PegDifference	If sent, this value must match the original order.	N	-9,999.99-9,999.99
	Standard Footer		*Y*	

7.3   Cancel/Replace Request

In addition to requirements for the standard FIX message header, only the following fields are used by the application layer for an Order Cancel/Replace (Change) Request. Any other fields specified in the message are ignored.

Tag	Field	Description	Req.	Values
	Standard Header		*Y*	*MsgType = G*
11	ClOrdID	This field contains the ID assigned to the change by your firm. This value must be <= 49 characters. It is critical that this ID is unique for all orders and changes sent today, as well as any orders or changes that may be active from previous days. If this value is duplicated; we will send a Cancel Reject.	Y	User specified up to 30 characters
18	ExecInst	This value must match the original order.	Y	1=Not Held 6=PNP f 6 (f *space* 6) = ISO
37	OrderID	If present, the value must exactly match the OrderID Global OTC assigns to the order.	N	Numerical up to 20 characters
38	OrderQty	This value can be changed	Y	Share prices > $0.01, 1-1,000,000 < $0.01, 1-10,000,000
40	OrdType	This value can be changed	Y	1=Market 2=Limit 5=MOC (Market On Close) 7=Inside Limit B=LOC (Limit on Close)
41	OrigClOrdID	This value must match the ClOrdID of the order being changed. Note in the case of multiple changes that. This value is the ClOrdID of the most current successful change.	Y	User specified up to 30 characters
44	Price	This value can be changed	Y	.0001-999999.99(Limit order only)
47	Rule80A	This value must match the original order.	Y	A = Agency P = Principal R = Riskless Principal
52	SendingTime	This value must be within 60 seconds of the current time, or we will reject the order.	Y	Time specified in UTC time. YYYYMMDD-HH-MM-SS
54	Side	This value must match the original order.	Y	1=Buy 2=Sell 5=Sell Short 8=Cross 9=Cross Short
55	Symbol	This value must match the original order.	Y	Valid Equities Symbol
59	TimeInForce	This value must match the original order.	Y	0=Day

Tag	Field	Description	Req.	Values
				2=At the Opening
				3=IOC
				4= FOK
97	PossResend	A change request sent with PossResend set is checked to see if it matches an existing order with the same ClOrdID.	N	Y
111	MaxFloor	This value must match the original order.	Y ©	>100 (Required if specified on the original order)
211	PegDifference	If sent, this value must match the original order.	N	-9,999.99-9,999.99
336	TradingSessionID (repeating field)	This value can be changed	N	1-3
386	NoTradingSessions	This value can be changed	N	P1,P2,P3
9534	UnsolicitedFlag	Indicates whether the order represents unsolicited customer interest and that such order is not from, or on behalf of, a company insider or affiliate of the issuer.	N	N (or blank, or not sent) = Solicited Y = Unsolicited
	Standard Footer		*Y*	

7.4   Execution Reports

Clients can expect to receive an acknowledgement on any order placed as well as any subsequent fills in the form of an execution report or MsgType=8. In addition to requirements for the standard FIX message header, the following fields will be specified on these messages.

Tag	Field	Description	Req.	Values
	Standard Header		**Y**	**MsgType = 8**
1	Account	If this field is present, we copy the information into execution messages referring to this order. This field can be used for clearing information.	N	User specified up to 10 characters
6	AvgPx	Indicates Average Price of fills on order	Y	.000001-999999.999999
11	ClOrdID	ID assigned to the order by the firm.	Y	User specified up to 30 characters
14	CumQty	Indicates total quantity of fills on open order	Y	1-10,000,000
17	ExecID	Execution ID assigned by Global OTC	Y	Numerical up to 20 characters
19	ExecRefID	On trade break or trade correction only	Y	Contains the ExecID (Tag 17) value of the Fill that is broken or corrected.
20	ExecTransType	All execution reports	Y	0=New 1=Cancel (Trade Break Only) 2=Correct (Trade Correction Only)
30	LastMkt	Designates system of execution	Y	BB = Global OTC
31	LastPx	Indicates price of fill	Y	.000001-999999.999999
32	LastShares	Indicates quantity of fill	Y	1-10,000,000
37	OrderID	OrderID assigned by Global OTC	Y	Numerical up to 20 characters
38	OrderQty	Indicates share quantity on order	Y	Up to 10,000,000
39	OrdStatus	Identifies current status of order	Y	0=New 1=Partially Filled 2=Filled 3=Done For Day 4=Cancelled 5=Replaced 6=Pending/Cxl Replace 8=Rejected C = Billable Cancel (STP Only) E= Pending Cxl/Replace (4.2 only)
40	OrdType	Indicates order type of order	Y	1=Market 2=Limit 5=MOC (Market on Close) 7=Inside Limit B=LOC (Limit On Close)
44	Price	Indicates price on order in decimals.	Y*	0.0001-9999999.9999 (Limit order only)
50	SenderSubID	Client will receive value specified in TargetSubID on order.	Y	ARCA
52	SendingTime	Time sent by Global OTC	Y	Time specified in UTC time. YYYYMMDD-HH-MM-SS (Default)

Tag	Field	Description	Reg.	Values
				*Logon Message determines time stamp granularity.
				Tag 96/Position 8 =
				0 - YYYYMMDD-HH-MM-SS
				1 - YYYYMMDD-HH-MM-SSsssssss
				2- YYYYMMDD-HH-MM-SSsss
				3 - YYYYMMDD-HH-MM-SSsssssssss
54	Side	Buy, Sell, or Sell Short	Y	1=Buy 2=Sell 5=Sell Short
55	Symbol	This field must contain a valid symbol in upper case lettering.	Y	Equities Ticker Symbol
57	TargetSubID	Client will receive value specified in SenderSubID on order.	Y (C)	User Specified up to 10 characters (Required if specified on the original order)
58	Text	Gives additional information on how the New Order, Cancel, or Cancel/Replace Message was handled.	Y	Examples of Information Text: • New Order • Partially Filled • Filled • Expired • Cancelled • Replaced • Pending/Cxl Replace • Rejected • Self + ClOrdID (STP Only)
59	TimeInForce	TIF from order. If TIF was not present on the original order, the default value is Day.	N	0=Day 2=At the Opening 3=IOC 4=FOK
60	TransactTime	Indicates time of transaction on ack or fill	Y	Time specified in UTC time. YYYYMMDD-HH-MM-SS (Default) *Logon Message determines time stamp granularity. Tag 96/Position 8 = 0 - YYYYMMDD-HH-MM-SS 1 - YYYYMMDD-HH-MM-SSsssssss 2- YYYYMMDD-HH-MM-SSsss 3 - YYYYMMDD-HH-MM-SSsssssssss
150	ExecType	Describes the specific Execution Report	Y	0=New 1=Partially Filled 2=Filled 3=Done For Day 4=Cancelled 5=Replaced 6=Pending Cxl/Replace 8=Rejected

Tag	Field	Description	Req.	Values
				C = Billable Cancel (No Self Trade Only) E= Pending Cxl/Replace (4.2 only)
151	LeavesQty	Indicates open shares remaining on order	Y	1-10,000,000
211	PegDifference		N	-9999.99-9999.99
9416	ExtendedExecInst	Returned if used on original order message	Y (C)	A = Add Liquidity Only
9534	UnsolicitedFlag	Indicates whether the order represents unsolicited customer interest and that such order is not from, or on behalf of, a company insider or affiliate of the issuer.	N	N (or blank, or not sent) = Solicited Y = Unsolicited
9730	LiquidityIndicator	Sent on Order Ack, Cancel pending, Cancelled, C/R Pending, and Replaced Acks conditionally	Y(C)	On Acknowledgements: 1 = Candidate for Liquidity Indicator "S" On Partial Fills and Fills: See Appendix A
	Standard Footer		*Y*	

7.5　Order Cancel Reject

In addition to requirements for the standard FIX message header, the following fields are returned on the Cancel or Cancel/Replace Reject Message.

Tag	Field	Description	Req.	Values
	Standard Header		**Y**	**MsgType = 9**
11	ClOrdID	This field contains the ClOrdID assigned by your firm.	C	User specified up to 30 characters
37	OrderID	If Tag 37 containing the Global OTC assigned OrderID is sent on the Cancel or Cancel/Replace Request, that value is returned. If no Tag 37 is sent, will contain the Tag 11 value sent on the Cancel or Cancel/Replace Request.	Y	Global OTC assigned OrderID (Up to 20 numerical characters) or User assigned ClOrdID (Tag 11 from Cancel or Cancel/Replace Request)
39	OrdStatus	Identifies status of the request	Y	8=Rejected
41	OrigClOrdID	This value is the ClOrdID of the most current successful change.	Y	User specified up to 30 characters
52	SendingTime	Time sent by Global OTC	Y	Time specified in UTC time. YYYYMMDD-HH-MM-SS (Default) *Logon Message determines time stamp granularity. Tag 96/Position 8 = 0 - YYYYMMDD-HH-MM-SS 1 - YYYYMMDD-HH-MM-SSssssss 2- YYYYMMDD-HH-MM-SSsss 3 - YYYYMMDD-HH-MM-SSsssssssss
58	Text	Gives information on why the Cancel or Cancel/Replace request was rejected	Y	Reason for Reject
60	TransactTime	Indicates time of transaction on ack or fill	Y	Time specified in UTC time. YYYYMMDD-HH-MM-SS (Default) *Logon Message determines time stamp granularity. Tag 96/Position 8 = 0 - YYYYMMDD-HH-MM-SS 1 - YYYYMMDD-HH-MM-SSssssss 2- YYYYMMDD-HH-MM-SSsss 3 - YYYYMMDD-HH-MM-SSsssssssss
102	CxlRejReason	Code to identify reason for cancel rejection.	Y	0 = Too Late To Cancel 1 = Unknown order 3 = Order is already in pending cancel or pending replace status
434	CxlResponseTo	Identifier of message type for which this reject message is a response	Y	1 = Order Cancel Request 2 = Order Cancel Replace Request
	Standard Footer		**Y**	

8   Global OTC Order Types

Order Type	FIX Tags	Description	Available Sessions
Market Order	OrdType (40)=1 (Market)	An order to buy or sell that is to be executed immediately upon entry at the best available quoted price.	Mkt Order Auction Core
Limit Order	OrdType (40) = 2 (Limit)	An order to buy or sell at a specified price ("limit price") or better. Limit Orders are displayed at the limit price.	All
PNP (post no preference)	OrdType (40) = 2 ExecInst (18) = 6	An instruction on a limit order that allows the order to temporarily slide (adjust) and display at one minimum price variation (MPV) below the current prevailing inside offer for bids or at one MPV above the current prevailing inside bid for offers if the order's limit price would lock or cross the prevailing inside bid or offer in the OTC equities marketplace. An order with a PNP attribute will not route away from Global OTC and may trade at an inferior price to a displayed bid or offer on an away market. Note: Firms should be aware that if they choose to add the ISO tag to a PNP order, the PNP+ISO order may execute at a price through the prevailing inside bid or offer in the OTC equities marketplace up to the order's limit price. Subscribers shall remain responsible for their best execution obligations.	All
ISO Immediate-Or-Cancel (IOC)	OrdType (40) = 2 ExecInst (18) =f 6 TimeInForce (59) = 3	Applying a time in force of IOC to an order type will override the routing or posting functionality and the order will only be available for execution on Global OTC. Any remaining unexecuted quantity is canceled back.	All
Inside IOC	OrdType (40) = 1 or 2 TimeInForce (59) = 3	A market or limit order that is to be executed in whole or in part on Global OTC as soon as the order is received. Any residual balance is cancelled. Inside IOC orders may not trade through better priced away market participants quotes.	All
Inside Limit	OrdType (40) = 7 TimeInForce (59) = 0 or 3	Instruction to display and match on Global OTC at the best obtainable price (up to the limit order price) or route (TIF=0 only) to the away market participants quoting the best available price (up to the limit order price). Any residual size will not be routed to the next price level until all quotes at the current best available price are exhausted.	All
Reserve Order	OrdType (40) = 2 (limit) MaxFloor (111) = (show size)	An instruction on a Limit Order to replenish the displayed quantity upon execution.	All
Market Peg	OrdType (40) = P ExecInst (18) = P (market peg) PegDifference (211) = offset to market (required)	An order with a price that will track, display, and peg off the best available bid or offer. Orders to buy are pegged to the offer and an orders to sell are pegged to the bid. The price of the order must be pegged to an offset from the bid or the offer.	Core

Order Type	FIX Tags	Description	Available Sessions
Primary Peg	OrdType (40) = P ExecInst (18) = R (primary peg) PegDifference (211) = offset to market (not required)	An order with a price that will track, display, and peg off the best available bid or offer. Orders to buy are pegged to the bid and orders to sell are pegged to the offer. An offset price is optional on a primary peg.	Core
NOW order	OrdType (40) = 1 (Market) or 2 (Limit) TimeInForce (59) = 3 ExecInst (18) = 1	Instruction on a Limit Order to route with a time in force of ISO IOC to one or more NOW recipients if the order cannot be executed on Global OTC. Applying a NOW designation will override any other instructions and the order will function as stated above.	All
Add Liquidity Only (ALO)	**ALO Order** OrdType (40) = 2 ExecInst (18) = 6 ExtendedExecInst (9416)= A	The ALO instruction specifies that a Limit Order is to be displayed and posted on Global OTC only when the order adds liquidity. A Limit Order with an ALO instruction will not route to away market centers. Orders with the ALO instruction will be cancelled if marketable upon acceptance.	All
Fill Or Kill	OrdType (40) = 2 TimeInForce(59) = 4 (FOK)	An instruction added to a Limit Order that specifies if the order cannot be executed in its entirety on Global OTC then the order will be immediately cancelled.	Core

Global OTC Auction Order Types			
Order Type	**FIX Tags**	**Description**	**Available Sessions**
Market On Open (MOO) Order	OrdType (40) = 1 (Market) Timeinforce (59) = 2	A market order that is to be executed only during the opening auction.	Opening Auction
Limit On Open (LOO) Order	OrdType (40) =2 (Limit) TimeInForce (59) = 2	A limit order that is to be executed only during the opening auction.	Opening Auction
Limit on Close (LOC)	OrdType (40) = B	A limit price order that is to be executed only during the closing auction.	Closing Auction
Market On Close (MOC)	OrdType (40) = 5	A market order that is to be executed only during the closing auction.	Closing Auction

Global OTC Unpriced Quotes
Global OTC offers Subscribers the ability to publish unpriced quotes for eligible symbols on the Global OTC IDQS. Any Subscribers wishing to publish unpriced quotes on Global OTC must contact the Global OTC Trade Support Desk as well as provide written instructions for doing so. Unpriced quotes display through the Global OTC XDP Market Data feeds as "name only" unpriced quotations attributed to the MPID of the Subscriber, are non-tradable and published each day by Global OTC on behalf of the Subscriber.

9 Appendix A: Liquidity Indicator Values (Tag 9730)

Description	Liquidity Indicator (Tag 9730)
Add	A
Add - Sub Dollar	D
Removing - Sub Dollar	E
Routed - Sub Dollar	H
Auction	O, G or Z
Removing	R
Set new Global OTC BBO and Adding Liquidity - Global OTC	S
Execution - Routed	X