

NYSE Pillar Gateway FIX IOI Protocol Specification

NYSE Equities
NYSE Arca Equities
NYSE American Equities
NYSE National Equities
NYSE Texas Equities

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1. Introduction

This document describes the implementation of the FIX 4.2 protocol used by the NYSE Group markets for entry of Indication of Interest (IOI) via the Pillar FIX Gateway. Each IOI session on the Pillar Gateway will be configured to access a single NYSE Group market.

Current Market Support	Future Market Support
NYSE Equities	NYSE Bonds
NYSE Arca Equities	
NYSE American Equities	
NYSE National Equities	
NYSE Texas Equities	

This document assumes the reader has a thorough understanding of the FIX 4.2 protocol available at <http://www.fixprotocol.org/>. As such, it is not intended as a guide to constructing a FIX client. Rather, it is a reference to ensure that a firm's FIX client, constructed according to the FIX 4.2 specifications, will be compatible with the Pillar FIX Gateway.

1.1 About the Pillar FIX Gateway

Pillar FIX Gateway is the application offering a single protocol for firms to transact business with one or more of the NYSE Group markets. It is a component of Pillar, an integrated trading technology platform that has been designed to reduce complexity, while enhancing consistency, performance and resiliency across the NYSE Group markets.

For more information on the Pillar trading platform, please visit <https://www.nyse.com/pillar>.

1.2 Failure Recovery

Each session on the Pillar Gateway is assigned two pairs of destination Pillar IP addresses, and one port number used by all four IPs. The IP/Port pairs correspond to the Pillar Primary and DR production environments.

- **Primary Production Environment** – Pillar FIX Gateway users may be logged in to either the primary or backup destination IP addresses, but not both, at any given time.
 - Once logged in, a successful login attempt on the other IP address will result in a logout on the first IP.
 - In the event that the primary destination becomes unavailable, the user should attempt to log in on the secondary IP address.
 - Resting IOIs will be zeroed out if the outage was caused by a gateway failure or when the login occurs on the secondary IP address
 - The sequence number on the secondary IP address will always continue from the last Application Layer message transacted on the primary IP (and vice versa). That is, Session Layer messages will not be recovered nor counted in determining the next sequence number expected from the client.
 - In the event of an intraday session restart, both Primary and Secondary destination IP addresses will be temporarily unavailable.

- Resting IOIs will be zeroed out.
- Upon restart:
 - If the session restart was not accompanied by a software release rollback, Application Layer messages transacted on the affected session prior to the outage will be recoverable, and the sequence number will continue from the last Application Layer message transacted. That is, Session Layer messages will not be recovered.
 - If the session restart was accompanied by a software release rollback, messages transacted on the affected session prior to the outage will not be recoverable. Sequence numbers will start with 1.
- **DR Production Environment** – In the event that the Pillar Primary Production environment becomes unavailable, Pillar FIX Gateway users may log in to the DR IP addresses configured for their sessions.
 - All resting IOIs will be zeroed out.
 - Messages transacted on the affected session prior to the outage will not be recoverable. Sequence numbers will start with 1.

1.3 Contact Us

The NYSE Group 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. Trading Services

2.1 Message Throttling

Inbound messages from a given session are read at a rate of 500 messages per rolling 100 milliseconds (including all Session and Application Layer message types).

A session becomes throttled when the message count reaches a value of 500 during the time window. A session becomes un-throttled when there are no messages to read from the firm.

Throttled messages are queued and processed in time sequence as the message read rate allows.

2.2 Denial of Service Restrictions

Pillar maintains a running counter of log in attempts and session level rejects on a per SenderCompID/Target IP address basis over the course of a trading day. If either of the counters reaches 100, the SenderCompID/Target IP will go into Denial of Service Mode. Upon entering this mode Pillar will:

- Reset counters for the SenderCompID/Target IP to zero
- Zero out all resting IOIs
- Disconnect the SenderCompID and refuse connection attempts to that specific TargetIP for 60 seconds

3. FIX Header & Trailer

All FIX messages sent and received via the Pillar FIX Gateway must include a Header and Trailer as defined below.

3.1 Header

Tag	Field Name	Data Type	Req'd	Values
FIX-8	BeginString	String[8]	Y	(ALWAYS FIRST FIELD IN MESSAGE) FIX.4.2
FIX-9	BodyLength	Int[6]	Y	(ALWAYS SECOND FIELD IN MESSAGE) Message length, in bytes, forward to the CheckSum field.
FIX-35	MsgType	String[3]	Y	(ALWAYS THIRD FIELD IN MESSAGE) A = Logon 0 = Heartbeat 1 = Test Request 2 = Resend Request 3 = Session Layer Reject 4 = Sequence Reset 5 = Logout 6 = Indication of Interest
FIX-34	MsgSeqNum	Int[20]	Y	Last sequence number processed. First message sent has sequence of 1.
FIX-43	PossDupFlag	Boolean	C	Y = Yes N = No
FIX-49	SenderCompID	String[32]	Y	Incoming Messages from Firm: Agreed upon Connection identifier set between the Exchange and the entering firm. Outgoing Messages from Exchange: Market Identifier Code (MIC) of the sending Exchange. ARCX = NYSE Arca Equities XASE = NYSE American Equities XCHI = NYSE Texas Equities XCIS = NYSE National Equities XNYS = NYSE Equities
FIX-50	SenderSubID	String[32]	C	Incoming Messages from Firm: This field is not supported. Outgoing Messages from Exchange: Set to the value of the original SenderCompID on the incoming message from the firm.
FIX-52	SendingTime	UTC Timestamp [27]	Y	Time of message transmission on Incoming Messages from Firms & Outgoing messages from Exchange. UTC time, in Milliseconds - YYYYMMDD-HH:MM:SS.mmm
FIX-56	TargetCompID	String[32]	Y	Incoming Messages from Firm: Market Identifier Code (MIC) of target Exchange. ARCX = NYSE Arca Equities XASE = NYSE American Equities XCHI = NYSE Texas Equities XCIS = NYSE National Equities XNYS = NYSE Equities

Tag	Field Name	Data Type	Req'd	Values
				Outgoing Messages from Exchange: Set to the value of the original SenderCompID on the incoming message from the firm..
FIX-122	OrigSendingTime	UTC Timestamp [27]	N	Original time of message transmission when transmitting orders as the result of a resend request. UTC time, in Milliseconds - YYYYMMDD-HH:MM:SS.mmm

3.2 Trailer

Tag	Field Name	Data Type	Req'd	Values
				(ALWAYS LAST FIELD IN MESSAGE; Always unencrypted)
FIX-10	Checksum	String[6]	Y	Three byte, simple checksum that serves, with the trailing <SOH>, as the end-of-message delimiter.

4. FIX Session Layer

This section describes the protocol for the initiation, operation, and termination of FIX sessions with the Pillar FIX Gateway. TCP/IP is the required transmission protocol, and FIX 4.2 is the required application protocol supplemented by certain custom tags and values as defined in this specification. The Pillar FIX Gateway will reject a message with any tags that are not defined for the given message type in this specification.

4.1 Pillar FIX Session Layer Handling

The Pillar FIX Gateway validates and handles inbound Session Layer messages according to the following rules:

- **MsgSeqNum as expected** – all messages with a sequence number equal to the expected value will be accepted and processed in full, provided they pass basic message type format validations. This includes both Session and Application Layer messages, regardless of the PossDup or GapFillFlag values indicated on the inbound message.
- **MsgSeqNum greater than expected** – in general, upon receipt of a message with a sequence number greater than the expected value, Pillar FIX Gateway will neither accept nor process the message and will not increment the expected client-side sequence number. The gateway will respond with a Resend Request with BeginSeqNo = the expected value, and EndSeqNo = 0 (infinity).

However, there are two cases with special handling:

- **Login Request with MsgSeqNum greater than expected** – Pillar FIX Gateway will send a Logon Response, immediately followed by the Resend Request.
- **Resend Request with MsgSeqNum greater than expected** – Pillar FIX Gateway will process the request, provided it passes basic message type format validations.

- **Sequence Reset with GapFillFlag set to N, or not set** – Pillar FIX Gateway will accept and process the request, provided it passes basic message type format validations. The expected client-side sequence number will be adjusted according to the NewSeqNo specified in the Sequence Reset message, as long as the requested number is higher than the next expected value.
- **MsgSeqNum less than expected** – in general, upon receipt of a message with a sequence number less than the expected value, Pillar FIX Gateway will respond with a Session-Level Reject message, then close the TCP connection. The expected client-side sequence number will not be incremented.

However, there are two cases with special handling:

- **Any Message with PossDup set to Y** – Pillar FIX Gateway will silently ignore the message.
- **Sequence Reset with GapFillFlag set to N, or not set** – Pillar FIX Gateway will accept and process the request, provided it passes basic message type format validations. The expected client-side sequence number will be adjusted according to the NewSeqNo specified in the Sequence Reset message, as long as the requested number is higher than the next expected value.

4.2 Logon

This single message format is used as either a Logon Request or Logon Response depending on the message direction:

Usage	Description	Direction
Logon Request	Request to establish a FIX session.	Client to Gateway
Logon Response	Confirmation a FIX session has been established successfully.	Gateway to Client

The Pillar FIX Gateway authenticates the Logon Request by checking the SenderCompID [49] against the Username [553] and Password [554]. If either the Username or Password does not match the previously agreed value for that SenderCompID, the Pillar FIX Gateway will send a Logout Message [35=5] with SessionStatus [1409=5], then close the TCP connection. If the Logon Request is authenticated, the Pillar FIX Gateway will respond with a confirmation Logon Response.

The format for the Logon Request message is below:

Tag	Field Name	Data Type	Req'd	Description	Values
	<i>Standard Header</i>		Y	MsgType [35] = A	
FIX-98	EncryptMethod	Int[1]	Y	Must be 0 (No encryption).	0
FIX-108	HeartBtInt	Int[2]	Y	The Heartbeat interval in seconds.	1-60
FIX-141	ResetSeqNum Flag	Boolean	N	Indicates both sides of a FIX session should reset sequence numbers. If included, this tag must be set to N.	N
FIX-553	Username	String [16]	Y	Username agreed in advance with NYSE Group – SenderCompID.	String [16]
FIX-554	Password	String [32]	Y	Password agreed in advance with NYSE Group. Required on Logon Request, but omitted from Logon response.	String [32]
	<i>Standard Trailer</i>		Y		

The format for the successful Logon Response message is below:

Tag	Field Name	Data Type	Req'd	Description	Values
	<i>Standard Header</i>		Y	MsgType [35] = A	
FIX-58	Text	String [100]	N	Text associated with Logon Response	String [100]
FIX-789	NextExpectedMsgSeqNum	Int [20]	Y	Next MsgSeqNum [34] expected by Pillar	Next MsgSeqNum [34] expected by Pillar
FIX-98	EncryptMethod	Int [1]	Y	Must be 0 (No encryption).	0
FIX-108	HeartBtInt	Int [2]	Y	The Heartbeat interval in seconds.	1-60
FIX-553	Username	String [16]	Y	Username agreed in advance with NYSE Group – SenderCompID.	String [16]
FIX-1409	SessionStatus	Int [1]	N	Status of FIX Session.	0 (Session Active)
	<i>Standard Trailer</i>		Y		

4.3 Logout

This single message format is used for different purposes depending on the message direction and SessionStatus [1409] value:

Usage	Description	Direction	SessionStatus [1409]
Logout Request	Client request to the Pillar FIX Gateway to terminate a FIX session.	Client to Pillar	n/a
Logout Response	The Pillar FIX Gateway response to a client Logout Request indicating the client may terminate the session.	Pillar to Client	0 = Session active
Unsolicited Logout	The Pillar FIX Gateway has terminated the FIX session.	Pillar to Client	4 = Session logout complete
Logon Reject	The Pillar FIX Gateway has rejected the client Logon Request.	Pillar to Client	5 = Invalid username or password

The format for the Logout message is below:

Tag	Field Name	Data Type	Req'd	Description	Values
	<i>Standard Header</i>		Y	MsgType[35] = 5	
FIX-1409	SessionStatus	Int[1]	N	Current status of the FIX session provided to indicate the message usage. The Pillar FIX Gateway will ignore this field if received from the client on a Logout message.	0 = Session Active 4 = Session logout complete 5 = Invalid username or password
FIX-58	Text	String [100]	N	Logout description.	String [100]
FIX-789	NextExpectedMsgSeqNum	Int[20]	Y	Next MsgSeqNum [34] expected by Pillar	Next MsgSeqNum [34] expected by Pillar
	<i>Standard Trailer</i>		Y		

4.4 Heartbeat and Test Request

The client must send a Heartbeat message [35=0] if the interval specified in the Logon Message HeartBtInt [108] passes without the client sending any messages. If HeartBtInt seconds pass without the Pillar FIX Gateway receiving any messages from the client, the Pillar FIX Gateway will send a Test Request [35=1] to solicit a Heartbeat from the client. If an additional HeartBtInt seconds pass without receiving any messages, the Pillar FIX Gateway will send a logout and close the TCP connection.

It is recommended that the client implements similar monitoring for messages received from the Pillar FIX Gateway.

The Heartbeat message format is below:

Tag	Field Name	Data Type	Req'd	Description	Values
	<i>Standard Header</i>		Y	MsgType[35] = 0	
FIX-112	TestReqId	String[20]	C	Required when the Heartbeat is in response to a Test Request. Must be the same value as in the Test Request that solicited the Heartbeat.	String[20]
	<i>Standard Trailer</i>		Y		

The Test Request message format is below:

Tag	Field Name	Data Type	Req'd	Description	Values
	<i>Standard Header</i>		Y	MsgType[35] = 1	
FIX-112	TestReqID	String[20]	Y	Identifier included in Test Request message to be returned in resulting Heartbeat.	String[20]
	<i>Standard Trailer</i>		Y		

4.5 Message Retransmission

If Pillar receives a MsgSeqNum [34] higher than expected, Pillar will disregard or process the message, and may issue a Resend Request, as described in the "Pillar FIX Session Layer Handling" section of this specification.

Clients may issue a Resend Request to Pillar. In response, Pillar will retransmit Application Layer messages only. Pillar will never retransmit any Session Layer messages (including Session-Level Rejects).

The format for the Resend Request message is below:

Tag	Field Name	Data Type	Req'd	Description	Values
	<i>Standard Header</i>		Y	MsgType[35] = 2	
FIX-7	BeginSeqNo	Int[20]	Y	The message sequence number of the first message in the range of messages to be re-sent.	1-18446744073709551615

Tag	Field Name	Data Type	Req'd	Description	Values
FIX-16	EndSeqNo	Int[20]	Y	The message sequence number of the last message in the range of messages to be re-sent. If the request is for all the messages since the BeginSeqNo, set EndSeqNo to 0.	0-18446744073709551615
	<i>Standard Trailer</i>		Y		

Note: Pillar will ignore the contents of PossResend [97] beyond basic message integrity validations and will treat all messages with PossResend = Y as new messages.

4.6 Sequence Reset

The client may send Pillar a Sequence Reset message to advance the next expected MsgSeqNum [34] Pillar should expect from the client:

Tag	Field Name	Data Type	Req'd	Description	Values
	<i>Standard Header</i>		Y	MsgType[35] = 4	
FIX-123	GapFillFlag	Boolean	Y	Indicates the mode in which the message is to be interpreted: Y = Gap Fill Reset (MsgSeqNum [34] validated) N = Sequence Reset (MsgSeqNum [34] ignored)	Y, N
FIX-36	NewSeqNo	Int[20]	Y	The new valid sequence number	1-18446744073709551615
	<i>Standard Trailer</i>		Y		

4.7 Session-Level Rejects

Pillar generates a Session-Level Reject upon receipt of a message containing a session-level rule violation (e.g. a required FIX tag is missing). Error details are contained in SessionRejectReason [373] and 58 [Text], while the tag causing the error (if applicable) is identified in RefTagID [371].

The Session-Level Reject message format is below:

Tag	Field Name	Data Type	Req'd	Description	Values
	<i>Standard Header</i>		Y	MsgType [35] = 3	
FIX-45	RefSeqNum	Int[20]	Y	The sequence number of the rejected message.	1-18446744073709551615

Tag	Field Name	Data Type	Req'd	Description	Values
FIX-373	SessionRejectReason	Int[2]	N	A code, which identifies the reason for the session level reject. 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 = Decryption problem 8 = Signature problem 9 = CompID problem (SenderCompID, TargetCompID, or both) 10 = SendingTime accuracy problem 11 = Invalid MsgType 13 = Tag Appears More than Once 14 = Tag specified out of required order 99 = Other	0 1 2 3 4 5 6 7 8 9 10 11 13 14 99
FIX-371	RefTagId	Int[9]	N	The tag number of the FIX field being referenced.	1-999999999
FIX-372	RefMsgType	String[2]	N	The MsgType of the FIX message being referenced.	String[2]
FIX-58	Text	String[100]	N	Reject text, which identifies the reason for the rejected message.	String[100]
FIX-789	NextExpectedMsgSeqNum	Int[20]	Y	Next MsgSeqNum [34] expected by Pillar	Next MsgSeqNum [34] expected by Pillar
	Standard Trailer		Y		

5. FIX Application Layer

This section describes the FIX Application messages currently supported by the Pillar FIX Gateway for Indication of Interest session. Only the message types represented here will be accepted.

5.1 Indication of Interest

This message is used to enter an Indication of Interest (IOI).

A client may have only one IOI per session/symbol/side at any given time. Every IOI for the same session/symbol/side will replace the existing one.

If SenderCompID (49) doesn't match with the expected IOI destination, the IOI message will be silently dropped.

To clear an IOI, send IOI (MsgType = 6) with IOIQty (27) = 0.

No application layer messages (acks, rejects, etc.) will be sent to clients in response to IOIs.

Tag	Field Name	Data Type	Req'd	Values	NYSE	American	National	Arca	Texas
	Standard FIX Header		Y	MsgType = 6	Yes	Yes	Yes	Yes	Yes
FIX-27	IOIQty	Qty[9]	Y	0 - 999,999,999 Value 0 indicates a cancellation of an IOI on a specific session/symbol/side When non-zero, must be ≥ Round Lot	Yes	Yes	Yes	Yes	Yes
FIX-54	Side	Char[1]	Y	1 = Buy 2 = Sell	1 2	1 2	1 2	1 2	1 2
FIX-55	Symbol	String[16]	Y	Valid Equities Ticker Symbol.	Yes	Yes	Yes	Yes	Yes
FIX-65	SymbolSfx	String[10]	N	Valid Suffix value	Yes	Yes	Yes	Yes	Yes
	Standard FIX Trailer		Y	Standard FIX Trailer	Yes	Yes	Yes	Yes	Yes

6. Document Version History

Date	Spec Version #	Change Summary
July 10, 2025	1.0	Initial draft version of the specification.