TEXAS STOCK EXCHANGE

FIX Specification: Session Protocol

FIX Session Layer and Message Framing

Contents

0.1 Revision History

Date	Version	Notes
July 23, 2025	0.1	Initial version.
September 09, 2025	0.6.draft	Alpha release. Refined message layout, identifiers and enumerations in line with early internal feedback.
October 28, 2025	0.7.draft	Updated support contact email.

Date	Version	Notes
December 10, 2025	0.8.draft	Enhanced session protocol documentation and added DefaultApplVerID validation requirement.
March 11, 2026	0.9.draft	Removed ApplVerID (tag 1128) from header. Added PossDupFlag and SequenceReset-GapFill message.

1 Overview

The **Texas Stock Exchange (TXSE)** supports electronic order entry and market data dissemination using the Financial Information eXchange (FIX) protocol, an industry standard for real-time electronic communication in the global financial markets. The Exchange adheres to FIX Protocol version 5.0 Service Pack 2 (FIX 5.0 SP2), as defined and maintained by the FIX Trading Community (https://www.fixtrading.org).

This specification outlines the Exchange's implementation of the FIX 5.0 SP2 Session Layer Protocol.

The document is intended for use by firms integrating with the Exchange via FIX, including broker-dealers, trading system vendors, and market participants developing or certifying FIX engines or client applications. Adherence to the Exchange FIX specification ensures consistent and reliable interaction with the Exchange's trading platform.

1.1 Session Establishment and Logon

The Logon message must be the first message sent by the Member to initiate a FIX session. The Exchange will respond with a Logon message if successful, or a Logout message if the Logon is unsuccessful.

Required Field: `NextExpectedMsgSeqNum(789)`

The Exchange requires that field `NextExpectedMsgSeqNum(789)` be set in the Logon message. This field indicates the next sequence number the sender expects to receive, enabling sequence number synchronization without the need for ResendRequest or gap-fill messages. The Exchange will include `NextExpectedMsgSeqNum(789)` in its Logon response, indicating the next sequence number it expects to receive from the Member.

- If `NextExpectedMsgSeqNum(789)` is set to a value less than the Exchange's expected sequence number, the Exchange will replay all messages generated beginning with the specified sequence number until the Member is fully synchronized.
- If `NextExpectedMsgSeqNum(789)` is set to 0, the Exchange will replay all messages generated during the current trading day.

Message replay includes all applicable messages, including execution reports and fills that may have been missed prior to reconnection.

Sequence Number Reset

The Exchange does not support `ResetSeqNumFlag(141)`. This flag must be omitted or set to false. Sending a Logon with `ResetSeqNumFlag(141)=true` will result in session termination with a Logout message.

Encryption Method

The Exchange only supports `EncryptMethod(98)=0` (NONE_OTHER). Any other encryption method will cause the session to terminate with a Logout message.

Heartbeat Interval

Field `HeartBtInt(108)` specifies the heartbeat interval in seconds. The Exchange accepts values between 10 and 300 seconds (inclusive). If not specified, the default value of 30 seconds will be used. Values outside this range will cause session termination.

1.2 Sequence Number Management

Each FIX session maintains independent sequence number series for incoming and outgoing messages. Sequence numbers begin at 1 and increment by 1 for each message sent or received.

Sequence Validation

The Exchange validates that every message received has `MsgSeqNum(34)` equal to the expected next sequence number. Receipt of a message with an incorrect sequence number will cause immediate session termination with a Logout message indicating the sequence number mismatch.

The Exchange never sends out-of-order messages. If a Member receives a message with an unexpected sequence number, the Member should terminate the session.

No Message Recovery

The Exchange does not support ResendRequest messages. Any ResendRequest received will cause the session to terminate with a Logout message.

The Exchange does not support SequenceReset messages, except for gap-fill purposes (`GapFillFlag(123)=Y`). Receipt of a SequenceReset with `GapFillFlag` not set to true will cause session termination. Members should use `NextExpectedMsgSeqNum(789)` in the Logon message for sequence number synchronization.

Persistence Across Connections

Sequence numbers persist across disconnections and reconnections. The Member should use `NextExpectedMsgSeqNum(789)` in the Logon message to synchronize sequence numbers when reconnecting.

1.3 Heartbeat Mechanism and Connection Monitoring

The Heartbeat mechanism ensures that both the Member and Exchange can detect network failures and maintain connection liveness. The heartbeat interval is established during the Logon exchange via field `HeartBtInt(108)`.

Heartbeat Timing

If no message is sent within the heartbeat interval, a Heartbeat message must be transmitted to maintain the connection. The heartbeat timer resets after every message transmission (not just Heartbeat messages).

The Exchange monitors for messages from the Member using a timeout of 1.5 times the agreed heartbeat interval. For example, with `HeartBtInt=30` seconds, the Exchange will timeout after 45 seconds of inactivity.

Connection Failure Detection

When the Member does not receive any message from the Exchange within the heartbeat interval, the Member should send a TestRequest message. If the Exchange does not receive a Heartbeat or other message from the Member within the timeout period (1.5 $\times$ heartbeat interval), the Exchange will terminate the session with a Logout message indicating a timeout.

TestRequest Exchange

The Exchange will never initiate a TestRequest to a Member. Only Members may send TestRequest messages to the Exchange. When the Exchange receives a TestRequest, it will respond with a Heartbeat message containing the same `TestReqID(112)` value from the TestRequest.

1.4 Session Termination and Error Handling

Sessions are terminated through the Logout message, either gracefully by the Member or due to protocol violations detected by the Exchange.

Member-Initiated Logout

If the Member sends a Logout message, the Exchange will immediately terminate the connection. The Exchange will close the TCP socket and return to accepting new connections.

Exchange-Initiated Logout

The Exchange will send a Logout message before terminating the connection in the following situations:

- Invalid or missing required fields in any message
- Incorrect message sequence numbers
- Parsing errors or malformed messages
- Invalid field values (e.g., unsupported encryption method, invalid heartbeat interval)
- Protocol violations (e.g., receiving ResendRequest, receiving Logon after session established)
- Heartbeat timeout (no messages received within 1.5 $\times$ heartbeat interval)
- Invalid checksum

The Exchange will always include field `Text(58)` in Logout messages with a human-readable explanation of the termination reason.

Session Recovery

After a session terminates, the Member may reconnect and send a new Logon message. The Member should use `NextExpectedMsgSeqNum(789)` to indicate the next sequence number expected from the Exchange, enabling sequence number synchronization without requiring message replay.

1.5 Message Validation and Protocol Requirements

The Exchange performs strict validation of all received messages to ensure protocol compliance.

CompID Validation

Every message must contain valid `SenderCompID(49)` and `TargetCompID(56)` fields. For messages received by the Exchange:

- `SenderCompID(49)` must match the Member's assigned CompID
- `TargetCompID(56)` must match the Exchange's CompID (as configured during on-boarding)

Mismatched CompIDs will cause immediate session termination.

Checksum Validation

Field `CheckSum(10)` must contain the correct three-digit checksum as defined by the FIX specification. Invalid checksums will result in session termination with a Logout message.

Message Structure

All messages must conform to the standard FIX message structure with proper field delimiters (SOH character, 0x01). Messages with malformed structure (e.g., consecutive SOH characters, missing required fields) will cause session termination.

Unsupported Message Types

The Exchange does not support certain session-level message types. Receipt of these messages will cause session termination with a Logout message:

- ResendRequest (MsgType=2)
- Reject (MsgType=3)
- SequenceReset without GapFillFlag (MsgType=4)

2 Types

Enum types used in this protocol. Enums that do not deviate from the standard, or whose meanings are commonly known, are not listed here.

2.1 DefaultApplVerID

Name	Value	Notes
FIX27	'0'	Not supported. Do not send.
FIX30	'1'	Not supported. Do not send.
FIX40	'2'	Not supported. Do not send.
FIX41	'3'	Not supported. Do not send.
FIX42	'4'	Not supported. Do not send.
FIX43	'5'	Not supported. Do not send.
FIX44	'6'	Not supported. Do not send.
FIX50	'7'	Not supported. Do not send.
FIX50_SP1	'8'	Not supported. Do not send.
FIX50_SP2	'9'	FIX 5.0 Service Pack 2. TXSE uses FIX 5.0 SP2 for all sessions.
FIX_LATEST	'10'	Not supported. Do not send.

2.2 EncryptMethod

Name	Value	Notes
NONE_OTHER	'0'	No encryption. TXSE requires EncryptMethod to always be set to 0.
PKCS	'1'	Not supported. Do not send.
DES	'2'	Not supported. Do not send.
PKCSDES	'3'	Not supported. Do not send.
PGPDES	'4'	Not supported. Do not send.
PGPDESMD5	'5'	Not supported. Do not send.
PEMDESMD5	'6'	Not supported. Do not send.

3 FIX Message Format

Standard FIX message structure with required header and trailer fields.

3.1 Header

Standard Header fields that must be present in every FIX message. These fields frame the message and provide essential routing and sequencing information.

Tag	Name	Req'd	Notes
8	BeginString	Y	Must be the first tag. Must be set to `FIXT1.1`.
9	BodyLength	Y	Must be the second tag. Length of message as defined by the FIX specification.
35	MsgType	Y	Enum MsgType. Must be the third tag. Type of message.
34	MsgSeqNum	Y	Sequence number of this message, starting from 1. Except for Logon, must be 1 plus the sequence number of the last message. The Exchange never sends out-of-order messages. Receipt of an out-of-order message will cause the session to terminate.
49	SenderCompID	Y	Sender's CompID, assigned by the Exchange during on-boarding. Must match the value assigned to the Member.
56	TargetCompID	Y	Target CompID. For messages sent to the Exchange, must be set to the Exchange's assigned CompID (provided during on-boarding).
52	SendingTime	N	Time the message was sent. Always set by the Exchange, but ignored on messages received by the Exchange.
43	PossDupFlag	N	Set to `Y` on SequenceReset-GapFill messages to indicate the message may contain a duplicate sequence number.

3.2 Trailer

Standard Trailer fields that must be present in every FIX message. The trailer provides message integrity validation.

Tag	Name	Req'd	Notes
10	CheckSum	Y	Must be the last tag. Checksum of message as defined by the FIX specification.

4 FIX Session Messages

Session-level messages used to establish, maintain, and terminate FIX sessions.

4.1 Heartbeat

Periodic message to ensure the network connection is still active. This message must be sent at every heartbeat interval if there is no other traffic in the session.

Tag	Name	Req'd	Notes
35	MsgType	Y	Enum MsgType. '0' for Heartbeat.
112	TestReqID	N	Set by the Exchange in response to a TestRequest. Omitted otherwise. Ignored by the Exchange on receipt. Members may omit.

4.2 Logon

This message must be the first message sent by the Member. The Exchange will respond with a Logon message, or a Logout message if the Logon is unsuccessful.

Tag	Name	Req'd	Notes
35	MsgType	Y	Enum MsgType. 'A' for Logon.
789	NextExpectedMsgSeqNum	Y	The next sequence number this sender expects to receive. See Logon.
554	Password	Y	Plain text token supplied by the Exchange during port setup.
98	EncryptMethod	N	Enum EncryptMethod. The Exchange will always set this to `NONE_OTHER(0)`. Members can omit this field or set it to the same value. Any other value is invalid.
141	ResetSeqNumFlag	N	Not supported. Must be omitted or set to false.
108	HeartBtInt	N	Time in seconds. Defaults to 30 if not set. The Exchange will always send this tag.
1137	DefaultApplVerID	N	Enum DefaultApplVerID. The Exchange will always set this to `FIX50_SP2(9)`. Members can omit this field or set it to the same value. Any other value is invalid.

4.3 Logout

Sent by the Exchange before terminating the connection. This message will be sent on any parsing error or missing required tags. If sent by the Member, the connection will be terminated.

Tag	Name	Req'd	Notes
35	MsgType	Y	Enum MsgType. '5' for Logout.
58	Text	N	Always sent by the Exchange. Human-readable text. Reason for logout. Members may omit.

4.4 SequenceReset

Sent by the Exchange during message replay to fill gaps in the sequence number stream. The Exchange only sends SequenceReset with `GapFillFlag(123)=Y`. Receipt of a SequenceReset without GapFillFlag set to true will cause session termination.

Tag	Name	Req'd	Notes
35	MsgType	Y	Enum MsgType. '4' for Sequence Reset.
123	GapFillFlag	Y	Always set to `Y` by the Exchange.
36	NewSeqNo	Y	The next sequence number after the gap.

4.5 TestRequest

Members may send a TestRequest to the Exchange. The Exchange will respond with a Heartbeat with the same `TestReqID(112)` the Member sent. The Exchange will never send a TestRequest to a Member.

Tag	Name	Req'd	Notes
35	MsgType	Y	Enum MsgType. '1' for TestRequest.
112	TestReqID	Y	Set by the Member.