Clearing Trade Interface

Version 1.3

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1.   Overview

The Options Clearing Trade Interface (CTI) is a direct data product offered by Nasdaq for the following option exchanges:

- Nasdaq ISE (ISE)
- Nasdaq GEMX (GEMX)
- Nasdaq MRX (MRX)
- Nasdsaq BX (BX)

CTI sends the following messages:

- Clearing trades, trade corrections and trade cancels on a low latency, real-time basis.
- Routed to a given firm's connection based on:

  – Clearing Member Trade Agreement (CMTA) or Options Clearing Corp. (OCC) Number and/or
  – Exchange Badge or House Number and/or
  – Exchange Internal Firm Identifier (IFI)

- Optional administrative messages:
- Options directory messages to relay option symbol and contract information for those options traded on the exchange.
- Complex Order Strategy Messages to relay information for those strategies traded on the exchange (available for ISE). The Strategy Message lists the legs which compose the Strategy and the leg ratios which uniquely define this Strategy for an underlying.
- Trading action messages to inform market participants when a specific option or strategy is halted or released for trading on the exchange.

2.   Architecture

2.1.   Network protocol

Messages are transported using SoupBinTCP v3.00 on top of TCP/IP.

2.2.   Connection

Due to scaled nature of the exchange system and need to minimize latency, connecting firms need to support at least one direct connection to each exchange subsystem where trades can come from.

Connection type	Number of instances	Description
Matching system	multiple	Matching system is scaled into multiple independent "rings" with each ring generating trades for a specified range of options. Option directory and complex strategy messages can be used to determine what options and complex strategies are served by a given subsystem.
Routing system	1	A separate system (routing ring) reports trades routed to and executed at away markets. In addition to away market trades, only option directory messages are sent down to connecting firms on this connection. Since there is one routing ring, the list of options sent down this connection consists of all options traded at the exchange. Trade corrections and trade cancels for away trades are not sent on this connection. They come on one of the connections from matching rings (see above) based on the option assignment.

For BX, ISE, GEMX and MRX, routed trades will be sent over the same connection as that of the matching system. There will not be any need to receive routed trades over a separate connection. |

BX, ISE, GEMX and MRX will have one connection to match ring for each exchange.

2.3. Failover

Message gaps due to short connection losses are easily recovered by reconnecting to the exchange with the last sequence number processed by the firm before disconnect. SoupBinTCP supports a store on the exchange side where it keeps all messages for a trading session sorted by sequence numbers regardless of the client's connection state. SoupBinTCP will send all sequenced messages starting with the sequence number requested by the firm upon login.

Upon certain failures CTI may be restarted. None of the trades are going to be lost. All messages in the CTI message store will be recreated. Trades, trade corrections and cancels will be marked as "possible duplicates". After recovery if firms reconnect with sequence number 1, they should be ready to process "possible duplicates" accordingly.

In the event of catastrophic issues, the whole exchange system may be restarted in the middle of the trading day (intraday session roll-over). In this case, a new SoupBinTCP session will be started. The CTI message store will be empty and not have trades/etc. from the previous session. Firms have to login with sequence number 1. Trade ids are guaranteed to be unique across sessions for the same trading day.

2.4. Backup

For each connection block, the exchange provides a backup with connections that have the same subscription and port as the primary connection block but different IP addresses.

If there is a physical problem with one of the primary connections, firms can switch to the corresponding backup connection immediately. There is one backup connection for each primary connection. For smooth transition, it is recommended to login to the backup connection with the last sequence number received on the primary connection before it went down.

If there is a physical problem with the whole datacenter which affects all connections and the problem is not going to be fixed until next day, firms have to be ready to connect to the disaster recovery site on the next day.

3. Subscription

Firms can configure their connections (each connection block separately) to route trade related messages based on the following match criteria (entitlements):

- OCC clearing number(s), and/or CMTA and/or
- Exchange badge(s) (house number + suffix,), and/or
- Exchange house number(s) (used by PHLX specialists and order providers) and/or
- IFI (exchange internal firm identifier which describes a group of exchange badges or/and houses)

"Excluding" logic is not supported. For example, "send all trades for OCC number 123 to a given connection block" is a valid configuration while "…except trades for badge 789-A" is not. Trade routing by firm names is not supported at this time either.

If an order provider supplies a CMTA number, CMTA number will be used for routing decisions instead of the order provider's default OCC clearing number. Firms can now optionally elect thru subscriber services to route trades based on the order provider's original OCC clearing number (give-up) when a CMTA is supplied.

By default, all non-trade related messages (events, options, strategies, and trading actions) are routed to the firms unconditionally. It is possible to request configuring firms' connections for sending only trade related messages without any events, options, strategies, and trading actions.

4. Exchange Specific Messages

Firms connecting to ISE options market will see all message types and field values described in the document related to the following functionality:

- Flash Auctions
- Block Auctions
- Facilitation Auctions
- Complex Facilitation Auctions
- Solicitation Auctions
- Complex Solicitation Auctions
- Complex Exposure Auctions
- PIM Auctions (Price improvement auction on ISE Options Market)
- Complex PIM Auctions
- QCC orders (Qualified Contingent Cross)
- Customer to Customer Cross

Firms connecting to GEMX & MRX Options Exchanges will see all message types and field values described in the document related to the following functionality:

- ISE Flash Auctions
- Block Auctions
- Facilitation Auctions
- Solicitation Auctions
- PIM Auctions (Price improvement auction
- QCC orders (Qualified Contingent Cross)
- Customer to Customer Cross

Firms connecting to BX Options Exchanges will see all message types and field values described in the document related to the following functionality:

- Block Auctions
- PRISM Auctions

5. Messages

CTI will support three basic types of messages:

- System Events
- Administrative Data
- Trade related information

A firm can request configuring its lines to send only trade related information.

All integer fields are unsigned big-endian (network byte order) binary numbers. All alphanumeric fields are left justified and padded on the right with spaces.

Trade Prices are long fields. When converted to a decimal format, prices are in fixed point format with 13 whole number places followed by 6 decimal digits. So price 1.3 will be a long number with value of 1300000.

All other price fields are integer. When converted to a decimal format, prices are in fixed point format with 13 whole number places followed by 4 decimal digits. So price 1.3 will be a long number with value of 13000.

Each message has a time located at offset 1 (Seconds, Nanoseconds). This time reflects the time when the message was created by the system not sent out. If firms connecting to CTI request to resend the message on reconnect, the message time will not change. "Seconds" is the number of whole seconds after midnight of the day and "Nanoseconds" is the remaining sub-second portion of the time. The "Seconds" field will have a range of 0 to 86400 (i.e. 12:00:00am to 11:59:60pm (Leap second)) and "Nanoseconds" will have a range of 0 to 999999999. All times in this protocol are U.S. Eastern Time zone.

Each message has a 1byte version number at offset 9 indicating current CTI message version. Version number is decoded as Mn, where M is major version and n is minor version. For example, CTI version 2.0 will be sent as 20, 1.3 will be sent as 13.

5.1.   System Event

The system event message is used to signal a ring wide event.

Name	Offset	Size	Value	Notes
Message type	0	1	"S"	System event message
Seconds	1	4	Integer	Seconds portion of timestamp
Nanoseconds	5	4	Integer	Nanoseconds portion of timestamp
Version	9	1	Integer	CTI version (currently set to 21)
Event code	10	1	Alpha	Refer to System Event Codes below

Event Code	Explanation	When (typically)
"O"	Start of Messages. This is always the first message sent in any trading day.	After ~4:00am
"S"	Start of System Hours. This message indicates that the exchange is ready to start accepting orders.	7:00am
"F"	Start of Currency Opening Process. This message is intended to indicate that the options system has started its opening auction process for currency options.	7:30:00am
"Q"	Start of Opening Process. This message is intended to indicate that the exchange has started its opening process.	9:30:00am
"L"	End of Late Hours Processing. This message is intended to indicate that the exchange will no longer accept any new orders or changes to existing orders for options that trade during extended hours.	4:15:00pm

5.2.   Options Directory

At the start of each trading day, the exchange disseminates directory messages for all symbols trading on a given ring.

Name	Offset	Size	Value	Notes
Message type	0	1	"D"	Options directory message
Seconds	1	4	Integer	Seconds portion of timestamp
Nanoseconds	5	4	Integer	Nanoseconds portion of timestamp
Version	9	1	Integer	CTI version (currently set to 20)
Option id	10	4	Integer	Option id assigned by exchange daily
Security symbol	14	5	Alpha Numeric	Option "root" symbol
Expiration year, month and day	19	2	Integer	Expiration date of the option: Bits 0-6 = Year (0-99) Bits 7-10 = Month (1-12) Bits 11-15 = Day (1-31) Bit 15 is least significant bit
Strike price	21	4	Integer	Strike price of the option (see Messages section for field processing)
Option kind	25	1	Alpha	"C" = Call "P" = Put

Name	Offset	Size	Value	Notes
Source	26	1	Integer	Connection source: 0 = Away trade Connection 1-N = Local trade connection
Underlying symbol	27	13	Alpha	Underlying stock symbol (left justified, space filled)
Option closing type	40	1	Alpha	"N" = Normal hours "L" = Late hours "W" = WCO Early Closing at 12:00 Noon (PHLX Only)
Tradable	41	1	Alpha	"Y" = Option is tradable "N" = Option is not tradable
MPV	42	1	Alpha	Minimum Price Variation for this option. See Notes below for further explanation: "E" = penny Everywhere "S" = Scaled "P" = penny Pilot
Closing Only	43	1	Alpha	"Y" = Option is Closing Position Only. Only MM origin orders can have open position in the series. "N" = Option is not Closing Position Only.
Contract Size	44	4	Integer	Underlying Deliverable size

NOTE: The options directory messages are sent once per symbol, typically before the "Start of System Hours" System Event. Should it be necessary, intra-day updates to this message will be sent as they occur.

The Minimum Price Variation (MPV) has the following values:

a. "E" – All prices are in penny increments
b. "S" – Prices below $3.00 are in increments of $0.05, prices above $3.00 are in increments of $0.10
c. "P" – Prices below $3.00 are in increments of $0.01, prices above $3.00 are in increments of $0.05

5.3. Complex Order Strategy (Specific to ISE only)

This is the strategy associated to a complex order. The Strategy ID assigned for a new complex strategy is unique for a particular complex instrument for a trading session however Strategy IDs are independent of session Option IDs and uniqueness of the IDs across both complex and simple options is not guaranteed.

Name	Offset	Size	Value	Notes
Message type	0	1	"R"	Complex order strategy message
Seconds	1	4	Integer	Seconds portion of timestamp
Nanoseconds	5	4	Integer	Nanoseconds portion of timestamp
Version	9	1	Integer	CTI version (currently set to 20)
Strategy id	10	4	Integer	Strategy id assigned daily
Source	14	1	Integer	Source of the strategy assigned daily: 1-N = Local trade connection #1-N
Underlying symbol	15	13	Alpha	Underlying stock symbol (left justified, space filled). All legs in this strategy belong to this Underlying
Action	28	1	Alpha	State of the strategy: "A" = Add "D" = Delete

Name	Offset	Size	Value	Notes
Number of legs	29	1	Integer	Number of legs in the strategy NOTE: Leg field offsets below are an equation, where "n" is the zero based leg number (0, 1, ...)
Leg information, legs repeated. n = 0, 1,...				
Option id	21n + 30	4	Integer	Option id for this leg (matches with id in the options directory message). Zero for stock leg
Security symbol	21n + 34	5	Alpha Numeric	Option "root" symbol. Blank for a stock leg (use underlying symbol instead)
Expiration year, month and day	21n + 39	2	Integer	Expiration date of the option: Bits 0-6 = Year (0-99) Bits 7-10 = Month (1-12) Bits 11-15 = Day (1-31) Bit 15 is least significant bit Zero for stock leg.
Strike price	21n + 41	4	Integer	Strike price of the option (see Messages section for field processing). Zero for stock leg.
Option kind	21n + 45	1	Alpha	"C" = Call "P" = Put " "(space) = Stock leg
Side	21n + 46	1	Alpha	"B" = Leg is on buy side "S" = Leg is on sell side
Leg ratio	21n + 47	4	Integer	Strategy leg ratio

5.4. Security Trading Action

This administrative message indicates the current trading status of an option within the exchange.

The exchange will send out a Trading Action message with the "T" (Trading resumed) for all options that are eligible for trading at the start of the Options Market system hours. If a security is absent from the pre-opening Trading Action spin, firms should assume that the security is being treated as halted at the start of the system hours.

Name	Offset	Size	Value	Notes
Message type	0	1	"H"	Trading action message
Seconds	1	4	Integer	Seconds portion of timestamp
Nanoseconds	5	4	Integer	Nanoseconds portion of timestamp
Version	9	1	Integer	CTI version (currently set to 20)
Option id	10	4	Integer	Option id assigned by exchange daily
Security symbol	14	5	Alpha Numeric	Option "root" symbol
Expiration year, month and day	19	2	Integer	Expiration date of the option: Bits 0-6 = Year (0-99) Bits 7-10 = Month (1-12) Bits 11-15 = Day (1-31) Bit 15 is least significant bit
Strike price	21	4	Integer	Strike price of the option (see Messages section for field processing)
Option kind	25	1	Alpha	"C" = Call "P" = Put
Current trading state	26	1	Alpha	Current trading state for the option on the exchange: "H" = Halt in effect "T" = Trading resumed

5.5. Complex Trading Action (Specific to ISE only)

This administrative message indicates the current trading status of a strategy within the exchange.

The exchange will send out a Strategy Trading Action message with the "T" (Trading Resumed) for all strategies that are eligible for trading at the start of the Options Market system hours. If a strategy is absent from the pre-opening Trading Action spin, firms should assume that the strategy is being treated as halted at the start of the system hours.

Name	Offset	Size	Value	Notes
Message type	0	1	"I"	Strategy trading action message
Seconds	1	4	Integer	Seconds portion of timestamp
Nanoseconds	5	4	Integer	Nanoseconds portion of timestamp
Version	9	1	Integer	CTI version (currently set to 20)
Strategy id	10	4	Integer	Strategy id assigned daily
Current trading state	14	1	Alpha	Current trading state for the strategy on the exchange: "H" = Halt in effect "T" = Trading resumed

5.6. Trade

The exchange sends trades and corrections using this message. Trade cancels can be delivered using this message too if configured on the firm's request but by default CTI sends cancels using different message type (see Trade Cancels section below). Note that CTI trades differ from executions sent on FIX, SQF, or OTTO interface. Executions concern only with price and total volume traded while clearing trades have to provide information about contra sides. FIX, SQF and OTTO users will get execution information about their side only whereas CTI users will get the execution along with contra side information.

Each field has an indicator on the right side specifying if the field is populated for a specific exchange. Following code is used to denote each of the exchanges where CTI is available.

Exchange	Code
PHLX	X
NOM	Q
BX	T
ISE	I
GEMX	H
MRX	J

Name	Offset	Size	Value	Notes	X	Q	T	I	H	J
Message type	0	1	"T"	Trade message	•	•	•	•	•	•
Seconds	1	4	Integer	Seconds portion of trade time	•	•	•	•	•	•
Nanoseconds	5	4	Integer	Nanoseconds portion of trade time	•	•	•	•	•	•
Version	9	1	Integer	Currently set to 20	•	•	•	•	•	•
Send type	10	1	Alpha	"S" = Send (original transmission) "P" = Possible duplicate (unsolicited retransmission)	•	•	•	•	•	•
Symbol Information										
Option id	11	4	Integer	Option id assigned by exchange daily. Zero	•	•	•	•	•	•
Underlying symbol	15	13	Alpha	Underlying stock symbol (left justified, space filled)	•	•	•	•	•	•

Name	Offset	Size	Value	Notes	X	Q	T	I	H	J
Security symbol	28	5	Alpha numeric	Option "root" symbol. Blank for stock leg.	•	•	•	•	•	•
Expiration year, month and day	33	2	Integer	Expiration date of the option: Bits 0-6 = Year (0-99) Bits 7-10 = Month (1-12) Bits 11-15 = Day (1-31) Bit 15 is least significant bit. Zero for stock leg.	•	•	•	•	•	•
Strike price	35	4	Integer	Strike price of the option (see Messages section for field processing). Zero for stock leg.	•	•	•	•	•	•
Option kind	39	1	Alpha	"C" = Call "P" = Put " "(space) = Stock leg	•	•	•	•	•	•
Flags	40	2	Integer	Bit 0: Symbol in Penny Pilot (0=no, 1=yes) Bit 1: Symbol In Make/Take Program (0=no, 1=yes) Bit 2: Single Listed (0=no, 1=yes) (Will be available at a future date) Bit 3: Weekly Expiration (0=no, 1=yes) (Will be available at a future date) Bit 4: Monthly Expiration (0=no, 1=yes) (Will be available at a future date) Bit 5: Quarterly Expiration ((0=no, 1=yes) (Will be available at a future date) Bit 6-15: Not Used Bit 15 is least significant bit. When available, only one of Bits 3, 4 and 5 will be set to 1 for an option.	•	•	•	•	•	•
Trade Information										
Transaction Type	42	1	Alpha	"X" = new trade "Y" = trade correction "Z" = trade cancels (if trade cancel messages are to be sent using this message. See Trade Cancels description below)	•	•	•	•	•	•
Liquidity	43	1	Integer	See Liquidity Codes Table below.	•	•	•	•	•	•
Trade id	44	4	Integer	Clearing trade Id. Coupled with correction number and trade side uniquely identifies a clearing trade for a given day.	•	•	•	•	•	•
Correction number	48	2	Integer	Trade correction number. 0 for new trades. Used to identify version of the trade being corrected. Increments by 1 for each subsequent correction (see examples).	•	•	•	•	•	•
Cross id	50	4	Integer	Trade Group Id. Ties together all clearing trades of a given atomic transaction in the matching engine. 0 if cross id is not available.	•	•	•	•	•	•
Match id	54	4	Integer	Execution Id for this side of the trade. Uniquely identifies an execution for a given day. Can be used to match executions sent on other feeds.	•	•	•	•	•	•

Name	Offset	Size	Value	Notes	X	Q	T	I	H	J
Auction id	58	4	Integer	Auction id for trades resulting from an auction. E.g. Complex Order Live Auction (Exposure/COLA),PIXL/PRISM/PIM Auction, etc... or 0 if none.	•		•	•	•	•
Auction Type	62	1	Alpha	Auction Type for trades resulting from an auction. Values: 'P' = Simple Order P IXL/PRISM/PIM 'Q' = Complex Order PIXL/PIM 'O' = Opening 'C' = Complex Order Live Auction (COLA)/ ISE Exposure Auction (CAO) 'Z'= Complex Opening Auction (PHLX ONLY) 'S' = Simple Order Solicitation 'R' = Complex Order Solicitation F = Simple Facilitation G = Complex Facilitation B = Block L = ISE Flash ' ' = No Auction Note: This field will be blank for Manual Trades	•		•	•	•	•
Ref trade id	63	4	Integer	For corrected trades, trade id of prior trade. 0 if never corrected. See examples for details.	•	•	•	•	•	•
Ref correction number	67	2	Integer	For corrected trades, correction number of prior trade. 0 if never corrected. See examples for details.	•	•	•	•	•	•
Ref Match Id	69	4	Integer	For corrected trades, Execution Id of the prior trade.	•	•	•	•	•	•
Execution Type[1]	73	1	Alpha	"A" = automatic "M" = manual	•	•	•	•	•	•

Name	Offset	Size	Value	Notes	X	Q	T	I	H	J
Execution market	74	1	Integer	For stock trades on ISE, market that executed the stock leg. 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) For Options Away execution market id: "A" = AMEX "B" = BOX "C" = CBOE "I" = ISE "N" = NYSE "Q" = NASDAQ "W" = C2 "Z" = BATS "X" = PHLX "T" = BX Options "M" = MIAX "P" = MIAX Pearl "H" = GEMX "E" = BATS EDGX "J" = MRX "U" = MEMX "S" = MIAX Sapphire " " (space) = Not away trade	•	•	•	•	•	•
Trade side	75	1	Alpha	"B" = Buy "S" = Sell	•	•	•	•	•	•
Trade price	76	8	Long	Trade price (see Messages section for field processing)	•	•	•	•	•	•
Trade contracts	84	4	Integer	Trade contracts	•	•	•	•	•	•
Side changed	88	1	Alpha	"Y" = for new trades and corrections that affected this side of the trade "N" = for corrections that affected only contra side (see examples for details)	•	•	•	•	•	•
Strategy id	89	4	Integer	Complex order strategy id which this trade is associated with. If either side of the trade involves a Complex Order, this field will be populated. Otherwise 0.	•			•		
Strategy leg	93	2	Integer	Leg reference if the trade involves a complex order or sweep. If either side of the trade involves a Complex Order, this field will be populated. The reference is a leg index (starting from 0) in Complex order strategy (starting from 0) in Complex order strategy message.	•			•		
Reserved²	95	8	N/A	Reserved for future extension						

Name	Offset	Size	Value	Notes	X	Q	T	I	H	J
Same Side Clearing Information										
OCC clearing number	103	4	Integer	OCC clearing number or CMTA provided by firm	•	•	•	•	•	•
Give-up OCC clearing number	107	4	Integer	OCC clearing number of the giving-up firm if OCC clearing number above is CMTA. Otherwise 0.	•	•	•	•	•	•
Exchange clearing number	111	4	Integer	Exchange assigned clearing number	•	•	•			
Exchange house	115	4	Integer	Exchange assigned house number	•	•	•	•	•	•
Exchange suffix	119	1	Alpha	Exchange assigned house suffix for market makers (badge suffix)	•	•	•	•	•	•
Capacity[3]	120	1	Alpha	"C" = Customer "E" = Proprietary Customer "R" = Retail Customer "P" = Professional Customer "B" = Broker Dealer Customer "M" = Exchange Registered Market Maker "O" = Other Exchange Registered Market Maker (FARMM/ AWAYMM) " " = Not Applicable (In Case of stock leg execution or routed away execution) "J" = Joint BackOffice (JBO) "F" = Firm "K" = Broker Dealer – Firm	•	•	•	•	•	•
Multi Account[4]	121	5	Alpha numeric	Sub or multi account	•	•	•	•	•	•
Broker	126	4	Alpha	Floor broker number/Executing Broker	•					
2nd broker	130	4	Integer	2nd floor broker number	•					
Origin Market	134	1	Alpha	Originating market of the order for market makers (FIX tag 207 "Security Exchange"): "A" = AMEX "B" = BOX "C" = CBOE "I" = ISE "N" = NYSE "Q" = NASDAQ "W" = C2 "Z" = BATS "X" = PHLX "T" = BX Options "M" = MIAX "H" = GEMX "E" = BATS EDGX "J" = MRX "U" = MEMX "S" = MIAX Sapphire " " = Not Applicable (In case the capacity of this side of trade is not 'O').	•	•	•			
Account	135	32	Alpha numeric	Account as specified in the order (FIX tag 1 "Account")	•	•	•	•	•	•
NSCC	167	4	Integer	NSCC clearing number for a stock leg	•					

Name	Offset	Size	Value	Notes	X	Q	T	I	H	J
MPID	171	5	Alpha numeric	For PHLX, NASDAQ assigned MPID number for a stock leg. For ISE, MPID of the firm at the stock executing venue.	•			•		
Clearing Flags	176	2	Integer	Bit 0: Priority Market Maker (0=no, 1=yes)				•		
Executing Broker	178	4	Alpha	Executing Broker				•		
Reserved²	182	6	N/A	Reserved for future extension				•	•	•
Contra Side Clearing Information										
OCC clearing number	188	4	Integer	OCC clearing number or CMTA provided by firm	•	•	•	•	•	•
Give-up OCC clearing number	192	4	Integer	OCC clearing number of the giving-up firm if OCC clearing number above is CMTA. Otherwise 0.	•	•	•	•	•	•
Exchange clearing number	196	4	Integer	Exchange assigned clearing number	•					
Exchange house	200	4	Integer	Exchange assigned house number	•					
Capacity³	204	1	Alpha	"C" = Customer "E" = Proprietary Customer "R" = Retail Customer "P" = Professional Customer "B" = Broker Dealer Customer "M" = Exchange Registered Market Maker "O" = Other Exchange Registered Market Maker (FARMM/ AWAYMM) " " = Not Applicable (In Case of stock leg execution or routed away execution) "J" = Joint BackOffice (JBO) "F" = Firm "f" = Proprietary Firm "K" = Broker Dealer – Firm	•	•	•	•	•	•
Broker	205	4	Integer	Floor broker number	•					
2nd broker	209	4	Integer	2nd floor broker number	•					
NSCC	213	4	Integer	NSCC clearing number for a stock leg	•					
MPID	217	5	Alpha Numeric	For PHLX, NASDAQ assigned MPID number for a stock leg. For ISE, MPID of the firm at the stock executing venue.	•			•		
Reserved²	222	8	N/A	Reserved for future extension						
Same Side Origin Information										
Firm	230	4	Alpha Numeric	Firm Identifier for the order or Quote	•	•	•	•	•	•
Order date	234	2	Integer	Date when a FIX order is received: Bits 0-6 = Year (0-99) Bits 7-10 = Month (1-12) Bits 11-15 = Day (1-31) Bit 15 is least significant bit 0 if the order is not a GTC or GTD order.	•	•	•	•	•	•
Order id	236	30	Alpha Numeric	Right padded FIX/OTTO order id or spaces. Will be populated with CLOrderID (or BranchSeqnbr if provided for FIX Orders only)	•	•	•	•	•	•

Name	Offset	Size	Value	Notes	X	Q	T	I	H	J
Quote id	266	8	Binary	Quote id for quotes with ids (from SQF feed v6 and higher). Right padded "1" for quotes without ids. Spaces if this side of the trade is a not a quote.	•	•	•	•	•	•
SQF Sweep id	274	8	Binary	Sweep id for order sweeps with ids (from SQF feed v6 and higher). Right padded "1" for sweeps without ids. Spaces if this side of the trade is a not a sweep.	•	•	•	•	•	•
Open/Close indicator	282	1	Alpha numeric	Open/Close indicator from FIX/OTTO orders. " "(space) for stock leg	•	•	•	•	•	•
Customer strategy leg	283	10	Alpha numeric	Leg reference id of a complex order as sent by the customer or spaces	•			•		
Short sell	293	1	Alpha	Short sell for a stock leg: "Y" = Short Sale "N" = Not a Short Sale "E" = Short Sale Exempt " " = Not Applicable (Not a Stock Leg)	•			•		
Principal agent	294	1	Alpha	Capacity for a stock leg: "A" = Agency Order "P" = Principle "R" = Riskless Principle " "(space) = Not a stock leg	•					
Supplementary Id	295	15	Alpha numeric	Supplementary Id from FIX orders (FIX tag 58 "Text")	•	•	•	•	•	•
Order Indicators	310	2	Integer	Bit 0 = FBMS order (0-no, 1-yes) Bit 1 = Directed/Preferenced (0-no, 1-yes) Bit 2 = Post Only /ALO (0-no, 1-yes) Bit 3 = MKT Order (0-no, 1-yes) Bit 4 = ISE Directed Order Bits 5-15 = not used Bit 15 is least significant bit. Note: Directed/Preferenced, Post Only, ISE Directed and MKT Order indicators will not be available for Manual Trades, Trade Correction and Cancels	•	•	•	•	•	•

Name	Offset	Size	Value	Notes	X	Q	T	I	H	J
Origin Type	312	1	Alpha	"O" = FIX Order "C" = FIX Complex Order "T" = OTTO Order "Z" = OTTO Complex Order "E" = OTTO Sweep (NOM only) "Q" = SQF Quote "W" = SQF Sweep "S" = SQF Complex Sweep "P" = Block Order "X" = Block Response "G" = PIXL/PRISM/PIM Primary Order "H" = PIXL/PRISM/PIM Contra Order "I" = PIXL/PRISM/PIM Response Order "J" = PIXL/PRISM/PIM Response SQF Sweep "g" = PIXL/PIM Primary Complex Order "h" = PIXL/PIM Contra Complex Order "i" = PIXL/PIM Response Complex Order "j" = PIXL/PIM Response SQF Complex Sweep "B" = FBMS Floor Trade "K" = QCC Primary "L" = QCC Contra "M" = Solicitation Primary Order "N" = Solicitation Contra Order "U" = Solicitation Response Order "V" = Solicitation Response SQF Sweep "m" = Solicitation Primary Complex Order "n" = Solicitation Contra Complex Order "u" = Solicitation Response Complex Order "v" = Solicitation Response SQF Complex Sweep "F" = Facilitation Primary Order "A" = Facilitation Contra Order "D" = Facilitation Response Order "Y" = Facilitation Response SQF Sweep "f" = Facilitation Primary Complex Order "a" = Facilitation Contra Complex Order "d" = Facilitation Response Complex Order "y" = Facilitation Response SQF Complex Sweep " "(space) = Others	•	•	•	•	•	•
Order Size	313	4	Integer	Size of the order/quote/sweep or 0 for manual trades.	•	•	•	•	•	•
Order Price	317	4	Integer	Price of the order/quote/sweep. 0 for MKT Orders (Indicated by MKT bit in OrderIndicators above). 0 for manual trades.	•	•	•	•	•	•

Name	Offset	Size	Value	Notes	X	Q	T	I	H	J
Tif	321	1	Alpha	Time In Force for the order/quote/sweep 'I' = IOC or FOK 'D' = DAY 'G' = GTC 'O' = OPG 'T' = GTD ' ' = Not Applicable (For quotes, manual trades).	•	•	•	•	•	•
Reserved²	322	8	N/A	Reserved for future extension						

Notes:

1. A trade (buy or sell) is considered automatic when it is assigned by the electronic matching engine else it is a manual trade. Examples: a quote matches with a resting order – both sides are automatic, an order sent from FBMS to the matching engine trades with a resting quote – both sides are automatic, two orders matched inside of FBMS outside of the matching engine – both sides are manual.
2. Assumptions about the contents of reserved fields are not recommended. They can be zero, spaces, or any other values.
3. XL has alternative names for capacity:
4. Registered Market Maker = On-Floor Market Maker,
5. Away Market Maker = On-Floor Market Maker Off-Floor, and Non-registered Market Maker = Off-Floor Market Maker.
6. Multi Account in XL will store Market Maker badge (house+suffix) for On-Floor Market Maker orders with CMTA.
7. FOK orders will be returned with TIF = IOC

5.7.   Cancel Trade

By default CTI sends trade cancels using this message. The alternative is to request configuring CTI for a given firm and connection block to send "extended" cancels with all the trade information using Trade message (described above) with transactionType set to Z.

Name	Offset	Length	Value	Notes
Message Type	0	1	"V"	Cancel trade message
Seconds	1	4	Integer	Seconds portion of cancel time
Nanoseconds	5	4	Integer	Nanoseconds portion of cancel time
Version	9	1	Integer	
Send type	10	1	Alpha	"S" = Send (original transmission) "P" = Possible duplicate (unsolicited retransmission)
Option id	11	4	Integer	Option id assigned by exchange daily. Zero for stock leg.
Underlying symbol	15	13	Alpha	Underlying stock symbol (left justified, space filled)
Security symbol	28	5	Alphanumeric	Option "root" symbol. Blank for stock leg.
Expiration year, month and day	33	2	Integer	Expiration date of the option: Bits 0-6 = Year (0-99) Bits 7-10 = Month (1-12) Bits 11-15 = Day (1-31) Bit 15 is least significant bit. Zero for stock leg.
Strike price	35	4	Integer	Strike price of the option (see Data Types for field processing). Zero for stock leg.
Trade id	40	4	Integer	Clearing trade Id

Name	Offset	Length	Value	Notes
Cross id	46	4	Integer	Trade Group Id. Ties together all clearing trades of a given atomic transaction in the matching engine.
Trade side	50	1	Alpha	"B" = Buy "S" = Sell
Match ID	51	4	Integer	Execution Id of the trade being cancelled.

6. Liquidity Codes

Code	Description	X	Q	T	I	H	J
1	Add/Maker			•	•	•	•
2	Remove/Taker			•	•	•	•
4	Response				•	•	•
5	Hidden			•	•	•	•
6	Opening Trade			•	•	•	•
7	Cross				•	•	•
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				•	•	•

Code	Description	X	Q	T	I	H	J
35	Facilitation				•	•	•
36	Facilitation Response				•	•	•
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				•	•	•
53	Combo Taker Against Regular – Thru NBBO						
54	Combo Taker Against IO – Thru NBBO						
55	Simple Exposure Order – Upon Receipt			•			
56	Simple Exposure Order – Subsequent			•			
57	Simplex Exposure Order – Responder			•			

7.   Examples

7.1.   Ref Trade Id and Correction Number in Trade message

As part of a transaction in the trading system, participant B buys 100 contracts from participant S:

> CTI sends a clearing trade to both participants with a new tradeId (let's say 5) and correctionNumber 0. Since this completely new trade (#5/0) doesn't refer to any prior trades, refTradeId and refCorrectionNumber in trade messages for buyer and seller are both set to 0.

Later back office changes the trade #5/0 taking 70 contracts from seller S and assigning them to another seller (let's say participant S2). The buyer stays the same:

> CTI sends a corrected trade (transactionType field is set to Y "Trade Correction") to buyer B and seller S for 30 contracts with unchanged tradeId (5) and correctionNumber incremented by 1 (0+1=1). refTradeId and refCorrectionNumber in messages for this trade #5/1 are set to refer to prior trade #5/0.

> Also as part of the change to the trade #5/0, CTI sends a new trade (transactionType X "new trade") to buyer B and seller S2 for 70 contracts with new tradeId (let's say 6) and correctionNumber 0. refTradeId and refCorrectionNumber in messages for this trade #6/0 are set to refer to prior trade #5/0.

If back office changes the trade #5/1 further taking 10 more contracts from seller S and assigning them to another seller (let's say participant S3 this time) with the same buyer:

CTI will send a corrected trade (transactionType field is set to Y "Trade Correction") to buyer B and seller S for 20 contracts with unchanged tradeId (5) and correctionNumber incremented by 1 (1+1=2). refTradeId and refCorrectionNumber in messages for this trade #5/2 are set to refer to prior trade #5/1.

Also as part of the change to the trade #5/1, CTI will send a new trade (transactionType X "new trade") to buyer B and seller S3 for 10 contracts with new tradeId (let's say 7) and correctionNumber 0. refTradeId and refCorrectionNumber in messages for this trade #7/0 are set to refer to trade #5/1.

7.2.   Sidechanged in Trade message

After participant B buys 100 contracts from participant S:

CTI sends a clearing trade to both participants with sideChanged set to Y(es).

If later back office changes price of the trade:

CTI will send a corrected trade (transactionType field set to Y "Trade Correction") to both participants with sideChanged set to Y(es)

Later back office changes the trade re-assigning all contracts on the sell side from participant S to participant S2 and keeping the same buyer:

CTI sends a corrected trade (transactionType = "Trade Correction") to buyer B with sideChanged set to N(o) because all that changed for the buyer is a contra side. Participant S gets a trade cancel, and participant S2 gets a new trade with sideChanged set to Y(es).

If later back office splits the sell side between existing seller S2 and 5 more sellers keeping the same buyer:

CTI will send 6 corrected trades to buyer B with sideChanged set to N(o) because total contracts didn't change (only contra side). Participant S2 gets a trade correction too but his sideChanged will be Y(es) because the seller's contracts got reduced. All other new sellers will get new trades with sideChanged set to Y(es).

8.   Support

Department	Phone	Email
Market Operations	877-473-9989	optionshelpdesk@nasdaq.com
Subscriber Services	215-496-5473	subscriber@nasdaq.com

9. Appendix A – Revision Control Log

January 23, 2024: Clearing Trade Interface 2.1
- Added MIAX Sapphire Exchange Code (S) to Execution Market and Origin Market

June 14, 2023: Clearing Trade Interface 2.1
- Adding MEMX spec updates to Security Exchange, Last Mkt, Liquidity Flag, Execution Mkt and Origin Mk

September 1, 2020: BX Replatform implementation
- Introducing additional liquidity codes, Simple Exposure (55-57) will be applicable for the BX Launch

September 9, 2019: BX Replatform implementation
- Introducing support for BX Fusion

July 13, 2017 Clearing Trade Interface (CTI) 2.1
- Adjusting Origin Type enumeration for "OTTO Complex" to "Z" and "OTTO Sweep" to "E" (as it exists on NOM currently) in Trade Message (Section 5.6)

April 19, 2017 Clearing Trade Interface (CTI) 2.1
- Adjusting Origin Type enumeration for "Block Response" to "X" in Trade Message (Section 5.6)

March 8, 2017 Clearing Trade Interface (CTI) 2.1
Changes:
- Adjusting Origin Type enumeration for "Block Response" to "W" in Trade Message (Section 5.6)
- Adjusting Origin Type description for Enumeration "E" to "OTTO Complex Order"
- Adjust Version in System Event Message to "21" representing 2.1
- Clarifying SoupBin TCP version 3.0
- Correcting Trade Message Offsets
- Clarifying Trade prices are long fields and other prices are integer

January 13, 2017 Clearing Trade Interface (CTI) 2.1
Changes:
- Adjusting enumeration to "F" for System Event Start of Currency Opening Process
- Adding MIAX Pearl enumeration as "P" to Execution market

Dec 16, 2016 Clearing Trade Interface (CTI) 2.1
Changes:
- Adjusting enumeration to "E" for Proprietary Customer, "B" for Broker Dealer – Customer, "R" for retail and "K" for Broker Dealer – Firm in Trade Message

Nov 18, 2016: Clearing Trade Interface (CTI) – Version 2.1
Changes:
- Adding System Event code for "Start of Currency Opening Process"
- Fill or Kill orders will have TimeInForce = IOC
- Changing liquidity codes from Alpha to Numeric data type

- OrderID will be BranchSequence Number if provided for FIX Orders
- Adding Block/Facilitation to OriginType

Sep 13, 2016: Clearing Trade Interface (CTI) – Version 2.0
Changes:

- New Messaging with support for NASDAQ ISE, GEMX and MRX exchanges.

Feb 24, 2016: Clearing Trade Interface (CTI) – Version 1.3
Changes:

- Changed Start Of Messages Event time from 6:00am to 4:00am.

Feb 01, 2016: Clearing Trade Interface (CTI) – Version 1.3
Changes:

- Added ISE MERCURY Exchange Code (J) to Execution Market and Origin Market.

Sep 30, 2015: Clearing Trade Interface (CTI) – Version 1.3
Changes:

- Added BATS EDGX Exchange Code (E) to Execution Market and Origin Market.

Aug 10, 2015: Clearing Trade Interface (CTI) – Version 1.3
Changes:

- Added WCO Early Close Time 'W' for option directory message.
- Added WCO Early Close Time 'W' for System Event message.

May 27, 2015: Clearing Trade Interface (CTI) - Version 1.3
Changes:

- Added Auction Type, Auction ID and ClearingFlags to BX Options Market for PRISM Cross.

Mar 02, 2015: Clearing Trade Interface (CTI) - Version 1.3
Changes:

- Added explanation about strategy ID in section 5.3 (Complex Order Strategy).

Mar 19, 2014: Clearing Trade Interface (CTI) - Version 1.3
Changes:

- Added Capacity 'J' for Joint Back Office (JBO) Orders.
- Added Executing and Origin Market Code 'H' for ISE Gemini exchange.

Jan 29, 2013: Clearing Trade Interface (CTI) - Version 1.3
Changes:

- Added Liquidity Codes for Order Exposure Alert (Flash Trade).
- Explained that new Alpha-Numeric liquidity codes may be added in future without any notice.

Nov 9, 2012: Clearing Trade Interface (CTI) - Version 1.3

Changes:

- Added Executing Market Code ("M") for Miami Stock Exchange (MIAX).

July 20, 2012: Clearing Trade Interface (CTI) - Version 1.3

Changes:

- Added Auction Type and Origin Type values for
- Simple Order Solicitation
- Complex Order PIXL
- Complex Order Solicitation

May 21, 2012: Clearing Trade Interface (CTI) - Version 1.3

Changes:

- Added Contra Capacity To NOM.
- Explained when the following fields can be blank or 0
- Origin market
- Order Date
- Short Sell Indicator.

March 23, 2012: Clearing Trade Interface (CTI) - Version 1.3

Changes:

- Added NASDAQ OMX BX Options Market.
- Reversed Revision Control Log (this Appendix) to have the latest change at the top.

October 19, 2011: Clearing Trade Interface (CTI) - Version 1.3

Changes:

- New version with support for Real Time Billing.

April 4, 2011 Clearing Trade Interface (CTI) - Version 1.2

Changes in Trade Message:

- Added "QCC Primary" and "QCC Contra" as possible values in "Origin Type" field

December 8, 2010: Clearing Trade Interface (CTI) - Version 1.2

Changes:

- Made one document for NASDAQ Options Market (NOM) and NASDAQ PHLX Options Market (XL).
- Trade messages changes:
- Increased Account from 10 bytes to 32
- Added "Opening Trade" to Liquidity field
- Added "Opening Trade Customer to Customer" to Liquidity field
- Added "Away Market Maker" and "Non-Registered Market Maker" to "Capacity" field
- Added "OTTO Order" and "OTTO Sweep" to "Origin Type" field October 18, 2010: Clearing Trade Interface (CTI) - Version 1.1 Changes:

- Added explanation for Give-Up CMTA and MM-Acronym fields for new On-Floor Market Maker order with CMTA (Fix tag 204=9).
- Populate contents of Match ID in the Trade message for corrections. Updated the notes content of the Match ID field in the trade message to denote that the field will now be populated for corrections.

September 17, 2010: Clearing Trade Interface (CTI) - Version 1.1

Changes:

- Added Origin Type to Trade Messages
- Added a comment to the 'Strategy id' and 'Strategy Leg' Field Notes

July 8, 2010: Clearing Trade Interface (CTI) - Version 1.1

Changes:

- Added an option of sending trade cancels using trade messages

May 13, 2010: Clearing Trade Interface (CTI) - Version 1.1

Changes:

- =Changed Architecture section

  - Away trade corrections and cancels are not sent on "Away Trades" line. They come down on one of the trade lines based on the underlying assignment.
  - In Overview mentioned that administrative and market event messages are optional
  - Added failover section
  - Added Subscription section
  - Changed Version field in System Event message to 11
  - Added MatchId field to Trade Message
  - Added reserved fields to Trade Message
  - Added Supplementary Id field to Trade Message (order info section)
  - Added Order Indicators to Trade Message (with FBMS order indicator)
  - Changed many notes for trade message fields
  - Added notes after Trade message
  - Added example section

April 21, 2010: Clearing Trade Interface (CTI) - Version 1.0

Initial Release.