



Options Clearing Trade Interface (CTI)

Specification

Version 1.3

Options CTI
Interface Specification

Table of Contents

5.. Overview.....	3
2. Architecture	4
2.1 Network protocol.....	4
2.2 Connection	4
2.3 Failover.....	5
2.4 Backup.....	6
3. Subscription.....	7
4. Exchanges.....	8
5. Messages.....	9
5.1. System Event.....	10
5.2. Options Directory	11
5.3. Complex Order Strategy (Specific to PHLX XL only)	12
5.4. Security Trading Action.....	13
5.5. Complex Trading Action (Specific to PHLX XL only)	14
5.6. Trade	15
5.7. Cancel Trade.....	22
6. Examples.....	23
6.1 Ref Trade Id and Correction Number in Trade message	23
6.2 sideChanged in Trade message.....	24
7. Support.....	25
Appendix A – Revision Control Log.....	26

Options CTI Interface Specification

5.. Overview

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

- NASDAQ Options Market (NOM)
- NASDAQ PHLX Options Market (XL)
- NASDAQ OMX BX Options Market

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 PHLX XL only). 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.

Options CTI Interface Specification

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.

Firms get connections in blocks. Each block includes one connection for each ring. So for exchange with 4 matching and 1 routing rings, the connection block will include 5 connections that have the same IP port and subscription (see Subscription section below) but different IP addresses.

Options CTI Interface Specification

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.

Options CTI Interface Specification

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.

Options CTI Interface Specification

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),
- or/and
- Exchange badge(s) (house number + suffix, used by market makers),
- and/or
- Exchange house number(s) (used by 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 overrides OCC clearing number by supplying a CMTA number in orders, CMTA number will be used for routing decisions instead of the order provider's default OCC clearing number.

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.

Options CTI Interface Specification

4. Exchanges

Firms connecting to XL options market should expect to see all message types and field values described in the document except:

- OTTO orders and OTTO sweeps
- PRISM auctions (price improvement auction on BX Options)

Firms connecting to NOM or BX Options options market will not see message types or field values related to the following functionality not supported by NOM or BX Options at the current time:

- Complex orders
- PIXL auctions (price improvement auction on PHLX)
- FBMS (floor broker management system)
- Specialists (quotes and X-station)
- QCC orders (Qualified Contingent Cross)
- Solicitation auctions
- Complex PIXL auctions
- Complex Solicitation auctions

Options CTI Interface Specification

5. Messages

CTI will support three basic types of messages:

- o System Events
- o Administrative Data
- o 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.

Prices are integer fields. When converted to a decimal format, prices are in fixed point format with 6 whole number places followed by 4 decimal digits. So price 1.3 will be a integer 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.

Options CTI Interface Specification

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
Event code	9	1	Alpha	Refer to System Event Codes below
Version	10	1	Integer	CTI version (currently set to 12)

Event Code	Explanation	When (typically)
"O"	<i>Start of Messages.</i> This is always the first message sent in any trading day.	After ~2:00am
"S"	<i>Start of System Hours.</i> This message indicates that the exchange is ready to start accepting orders.	7:00am
"Q"	<i>Start of Opening Process.</i> This message is intended to indicate that the exchange has started its opening process.	9:30:00am
"N"	<i>End of Normal Hours Processing.</i> 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 normal hours.	4:00:00pm
"L"	<i>End of Late Hours Processing.</i> 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
"E"	<i>End of System Hours.</i> This message indicates that the system is now closed.	~5:30pm
"C"	<i>End of Messages.</i> This is always the last message sent in any trading day.	~5:35pm
"W"	<i>End of WCO Early closing. (PHLX only) This message is intended to indicate that the exchange will no longer accept any new orders or changes to existing Orders on last trading date of WCO options.</i>	12:00 Noon

Options CTI Interface Specification

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
Option id	9	4	Integer	Option id assigned by exchange daily
Security symbol	13	5	Alpha Numeric	Option "root" symbol
Expiration year, month and day	18	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	20	4	Integer	Strike price of the option (see Messages section for field processing)
Option kind	24	1	Alpha	"C" = Call "P" = Put
Source	25	1	Integer	Connection source: 0 = Away trade Connection 1-N = Local trade connection
Underlying symbol	26	13	Alpha	Underlying stock symbol (left justified, space filled)
Option closing type	39	1	Alpha	"N" = Normal hours "L" = Late hours "W" = WCO Early Closing at 12:00 Noon (PHLX Only)
Tradable	40	1	Alpha	"Y" = Option is tradable "N" = Option is not tradable
MPV	41	1	Alpha	Minimum Price Variation for this option. See Notes below for further explanation: "E" = penny Everywhere "S" = Scaled "P" = penny Pilot

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

Options CTI Interface Specification

5.3. Complex Order Strategy (Specific to PHLX XL 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	
Strategy id	9	4	Integer	Strategy id assigned daily	
Source	13	1	Integer	Source of the strategy assigned daily: 1-N = Local trade connection #1-N	
Underlying symbol	14	13	Alpha	Underlying stock symbol (left justified, space filled). All legs in this strategy belong to this Underlying	
Action	27	1	Alpha	State of the strategy: "A" = Add "D" = Delete	
Number of legs	28	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 + 29	4	Integer	Option id for this leg (matches with id in the options directory message). Zero for stock leg
	Security symbol	21n + 33	5	Alpha Numeric	Option "root" symbol. Blank for a stock leg (use underlying symbol instead)
	Expiration year, month and day	21n + 38	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 + 40	4	Integer	Strike price of the option (see Messages section for field processing). Zero for stock leg.
	Option kind	21n + 44	1	Alpha	"C" = Call "P" = Put " " (space) = Stock leg
	Side	21n + 45	1	Alpha	"B" = Leg is on buy side "S" = Leg is on sell side
	Leg ratio	21n + 46	4	Integer	Strategy leg ratio

Options CTI Interface Specification

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
Option id	9	4	Integer	Option id assigned by exchange daily
Security symbol	13	5	Alpha Numeric	Option "root" symbol
Expiration year, month and day	18	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	20	4	Integer	Strike price of the option (see Messages section for field processing)
Option kind	24	1	Alpha	"C" = Call "P" = Put
Current trading state	25	1	Alpha	Current trading state for the option on the exchange: "H" = Halt in effect "T" = Trading resumed

Options CTI
Interface Specification

5.5. Complex Trading Action (Specific to PHLX XL 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
Strategy id	9	4	Integer	Strategy id assigned daily
Current trading state	13	1	Alpha	Current trading state for the strategy on the exchange: "H" = Halt in effect "T" = Trading resumed

Options CTI Interface Specification

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 or SQF interface. Executions concern only with price and total volume traded while clearing trades have to provide information about contra sides. So if in a single transaction a given participant trades with multiple contra sides, the participant will get one execution message on SQF or FIX and multiple trade messages on CTI for each size traded with a particular contra side. "XL" "NOM" and "BX Options" columns specify whether the field is populated by XL CTI feed, NOM CTI feed and/or BX Options CTI feed.

Name	Offset	Size	Value	Notes	XL	NOM	BX Options
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	●	●	●
Send type	9	1	Alpha	"S" = Send (original transmission) "P" = Possible duplicate (unsolicited retransmission)	●	●	●
Symbol Information							
Option id	10	4	Integer	Option id assigned by exchange daily. Zero for stock leg.	●	●	●
Underlying symbol	14	13	Alpha	Underlying stock symbol (left justified, space filled)	●	●	●
Security symbol	27	5	Alpha numeric	Option "root" symbol. Blank for stock leg.	●	●	●
Expiration year, month and day	32	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	34	4	Integer	Strike price of the option (see Messages section for field processing). Zero for stock leg.	●	●	●
Option kind	38	1	Alpha	"C" = Call "P" = Put " " (space) = Stock leg	●	●	●
Flags	39	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)	●	●	●

Options CTI Interface Specification

				<p>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.</p> <p>When available, only one of Bits 3, 4 and 5 will be set to 1 for an option.</p>			
Trade Information							
Transaction Type	41	1	Alpha	<p>"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)</p>	●	●	●
Liquidity	42	1	Alpha	<p>"A" = Add "R" = Remove "J" = Order Exposure Alerted(Flash Order) "K" = Executed against a Flash Order. "F" = Opening Trade Customer to Customer "O" = Opening Trade "N" = None (not applicable) Note:</p> <ul style="list-style-type: none"> • 'F' and 'O' are not available on PHLX-XL system. • Additional ALPHA-NUMERIC values may be added in the future and should be considered as potential valid values by users of this interface. 	●	●	●
Trade id	43	4	Integer	Clearing trade Id. Coupled with correction number and trade side uniquely identifies a clearing trade for a given day.	●	●	●
Correction number	47	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	49	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	53	4	Integer	Execution Id (0 for manual trades). Uniquely identifies an execution for a given day. Can be used to match executions sent on SQF or other feeds.	●	●	●
Auction id	57	4	Integer	Auction id for trades resulting from an auction. E.g. Complex Order Live Auction (COLA), PIXL/PRISM Auction, etc... or 0 if none.	●		●

Options CTI Interface Specification

Auction Type	61	1	Alpha	<p>Auction Type for trades resulting from an auction. Values: `P` = Simple Order PIXL/PRISM `Q` = Complex Order PIXL `O` = Opening `C` = Complex Order Live Auction (COLA) `Z` = Complex Opening COLA `E` = Market Exhaust `S` = Simple Order Solicitation `R` = Complex Order Solicitation `` = No Auction</p> <p>Note: This field will be blank for Manual Trades, Trade Correction and Cancels</p>	●		●
Ref trade id	62	4	Integer	For corrected trades, trade id of prior trade. 0 if never corrected. See examples for details.	●	●	●
Ref correction number	66	2	Integer	For corrected trades, correction number of prior trade. 0 if never corrected. See examples for details.	●	●	●
Execution Type ¹	68	1	Alpha	"A" = automatic "M" = manual	●	●	●
Execution market	69	1	Alpha	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 "H" = ISE GEMINI "E" = BATS EDGX "J" = ISE MERCURY " " (space) = Not away trade	●	●	●
Trade side	70	1	Alpha	"B" = Buy "S" = Sell	●	●	●
Trade price	71	4	Integer	Trade price (see Messages section for field processing)	●	●	●
Trade contracts	75	4	Integer	Trade contracts	●	●	●
Side changed	79	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	80	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.	●		

Options CTI
Interface Specification

Strategy leg	84	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 message.	●		
Reserved ²	86	8	N/A	Reserved for future extension			
Same Side Clearing Information							
OCC clearing number	94	4	Integer	OCC clearing number or CMTA provided by firm	●	●	●
Give-up OCC clearing number	98	4	Integer	OCC clearing number of the giving-up firm if OCC clearing number above is CMTA. Otherwise 0.	●	●	●
Exchange clearing number	102	4	Integer	Exchange assigned clearing number	●	●	●
Exchange house	106	4	Integer	Exchange assigned house number	●	●	●
Exchange suffix	110	1	Alpha	Exchange assigned house suffix for market makers (badge suffix)	●	●	●
Capacity ³	111	1	Alpha	"C" = Customer "Y" = Broker Dealer "P" = Professional Customer "F" = Firm "M" = On-Floor Specialist, SQT or ROT(For PHLX) or NOM/ BX Options Market maker (For NOM/ BX Options) "A" = Remote Specialist or RSQT (PHLX Only) "O" = Non-PHLX Registered Market Maker (For PHLX) or Non-NOM/ BX Options Registered Market Maker (For NOM/ BX Options) "J" = Joint BackOffice (JBO)	●	●	●
Multi Account ⁴	112	5	Alpha numeric	Sub or multi account if provided in the order (FIX tag 440 "Clearing Account")	●	●	●
Broker	117	4	Integer	Floor broker number	●		
2 nd broker	121	4	Integer	2nd floor broker number	●		
Origin Market	125	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	●	●	●

Options CTI Interface Specification

				"H" = ISE GEMINI "E" = BATS EDGX "J" = ISE MERCURY "P" = MIAX PEARL " " = Not Applicable (In case the capacity of this side of trade is not 'O' or 'A').			
Account	126	32	Alpha numeric	Account as specified in the order (FIX tag 1 "Account")	●	●	●
NSCC	158	4	Integer	NSCC clearing number for a stock leg	●		
MPID	162	5	Alpha numeric	NASDAQ assigned MPID number for a stock leg	●		
Clearing Flags	167	2	Integer	Bit 0: Priority Market Maker (0=no, 1=yes)			●
Reserved ²	169	6	N/A	Reserved for future extension			
Contra Side Clearing Information							
OCC clearing number	175	4	Integer	OCC clearing number or CMTA provided by firm	●	●	●
Give-up OCC clearing number	179	4	Integer	OCC clearing number of the giving-up firm if OCC clearing number above is CMTA. Otherwise 0.	●	●	●
Exchange clearing number	183	4	Integer	Exchange assigned clearing number	●		
Exchange house	187	4	Integer	Exchange assigned house number	●		
Capacity ³	191	1	Alpha	"C" = Customer "Y" = Broker Dealer "P" = Professional Customer "F" = Firm "M" = On-Floor Specialist, SQT or ROT (For PHLX) or NOM/ BX Options Market maker (For NOM/ BX Options) "A" = Remote Specialist or RSQT (PHLX Only) "O" = Non-PHLX Registered Market Maker (For PHLX) or Non-NOM/ BX Options Registered Market Maker (For NOM/ BX Options) " " = Not Applicable (In Case of stock leg execution or routed away execution) "J" = Joint BackOffice (JBO)	●	●	●
Broker	192	4	Integer	Floor broker number	●		
2 nd broker	196	4	Integer	2nd floor broker number	●		
NSCC	200	4	Integer	NSCC clearing number for a stock leg	●		
MPID	204	5	Alpha numeric	NASDAQ assigned MPID number for a stock leg	●		
Reserved ²	209	8	N/A	Reserved for future extension			
Same Side Origin Information							
Firm	217	4	Alpha numeric	Firm for FIX/OTTO orders or spaces	●	●	●

Options CTI Interface Specification

Order date	221	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 FIX order.	●	●	●
Order id	223	30	Alpha numeric	Right padded FIX/OTTO order id or spaces	●	●	●
Quote id	253	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.	●	●	●
Sweep id	261	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	269	1	Alpha numeric	Open/Close indicator from FIX/OTTO orders. " "(space) for stock leg	●	●	●
Customer strategy leg	270	5	Alpha numeric	Leg reference id of a complex order as sent by the customer or spaces	●		
Short sell	275	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	276	1	Alpha	Capacity for a stock leg: "A" = Agency Order "P" = Principle "R" = Riskless Principle " "(space) = Not a stock leg	●		
Supplementary Id	277	13	Alpha numeric	Supplementary Id from FIX orders (FIX tag 58 "Text")	●	●	●
Order Indicators	290	2	Integer	Bit 0 = FBMS order (0-no, 1-yes) Bit 1 = Directed (0-no, 1-yes) Bit 2 = Post Only (0-no, 1-yes) (Will be available at a future date) Bit 3 = MKT Order (0-no, 1-yes) Bits 4-15 = not used Bit 15 is least significant bit. Note: Directed, Post Only and MKT Order indicators will not be available for Manual Trades, Trade Correction and Cancels	●	●	●
Origin Type	292	1	Alpha	"O" = FIX Order "C" = FIX Complex Order "T" = OTTO/QUO Order "E" = OTTO Sweep "Q" = SQF Quote "W" = SQF Sweep "S" = SQF Complex Sweep "F" = Floor (X-station) "G" = PIXL/PRISM Primary FIX Order "H" = PIXL/PRISM Contra FIX Order "I" = PIXL/PRISM Response FIX Order "J" = PIXL/PRISM Response SQF Sweep "g" = PIXL Primary FIX Complex Order	●	●	●

Options CTI Interface Specification

				"h" = PIXL Contra FIX Complex Order "i" = PIXL Response FIX Complex Order "j" = PIXL Response SQF Complex Sweep "B" = FBMS Floor Trade "K" = QCC Primary "L" = QCC Contra "M" = Solicitation Primary FIX Order "N" = Solicitation Contra FIX Order "U" = Solicitation Response FIX Order "V" = Solicitation Response SQF Sweep "m" = Solicitation Primary FIX Complex Order "n" = Solicitation Contra FIX Complex Order "u" = Solicitation Response FIX Complex Order "v" = Solicitation Response SQF Complex Sweep" "(space) = Others			
Order Size	293	4	Integer	Size of the order/quote/sweep or 0 for manual trades, trade correction and cancels.	●	●	●
Order Price	297	4	Integer	Price of the order/quote/sweep. 0 for MKT Orders (Indicated by MKT bit in OrderIndicators above). 0 for manual trades, trade correction and cancels.	●	●	●
Tif	301	1	Alpha	Time In Force for the order/quote/sweep 'I' = IOC 'D' = DAY 'G' = GTC 'O' = OPG '' = Not Applicable (For quotes, manual trades, trade cancel and corrections).	●	●	●
Reserved ²	302	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:
 Registered Market Maker = On-Floor Market Maker,
 Away Market Maker = On-Floor Market Maker Off-Floor, and
 Non-registered Market Maker = Off-Floor Market Maker.
- 4) Multi Account in XL will store Market Maker badge (house+suffix) for On-Floor Market Maker orders with CMTA.

Options CTI Interface Specification

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
Send type	9	1	Alpha	"S" = Send (original transmission) "P" = Possible duplicate (unsolicited retransmission)
Option id	10	4	Integer	Option id assigned by exchange daily. Zero for stock leg.
Underlying symbol	14	13	Alpha	Underlying stocks symbol (left justified, space filled)
Security symbol	27	5	Alphanumeric	Option "root" symbol. Blank for stock leg.
Expiration year, month and day	32	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	34	4	Integer	Strike price of the option (see Data Types for field processing). Zero for stock leg.
Option kind	38	1	Alpha	"C" = Call "P" = Put " "(space) = Stock leg
Trade id	39	4	Integer	Clearing trade Id
Correction number	43	2	Integer	Trade correction number. 0 for new trade.
Cross id	45	4	Integer	Trade Group Id. Ties together all clearing trades of a given atomic transaction in the matching engine.
Trade side	49	1	Alpha	"B" = Buy "S" = Sell

Options CTI Interface Specification

6. Examples

6.1 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.

Options CTI Interface Specification

6.2 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).

Options CTI
Interface Specification

7. Support

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Operation Center (NOC)	+1 212 231 5049	nocgroup@nasdaqomx.com
Subscriber Services	+1 212 231 5180	subscriber@nasdaqomx.com

Options CTI Interface Specification

Appendix A – Revision Control Log

November 19, 2018: Clearing Trade Interface (CTI) – Version 1.3

Changes:

- Adjust **origin type** enumeration to include OTTO and QUO

Dec 18, 2017: Clearing Trade Interface (CTI) – Version 1.3

Changes:

- Changed Start Of Messages Event time from 4:00am to 2:00am.

Jan 28, 2017: Clearing Trade Interface (CTI) – Version 1.3

Changes:

- Added MIAX PEARL Exchange Code (P) to Execution Market and Origin Market.

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).

Options CTI Interface Specification

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

Options CTI Interface Specification

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.