BX Options Glimpse for Top of Market

Technical Specifications

Version 1.1
09 Jan 2023
Approved

Document History

Revision	Published	Author(s)	Summary of Changes
1.1	01 09 2023		• Version updated to 1.1 • Clarifying the Data Types: Added "2 byte Price fields are unsigned positive numbers. 4 byte Price fields are signed positive numbers."
1.0	07.14.2020	J.Dinh	Initial version

Contents

1 Overview

A complement to the NASDAQ OMX BX Options Top of Market (BX Top) real-time data feed product, NASDAQ OMX BX Options GLIMPSE (BX GLIMPSE) for Top of Market is a point-to-point data feed connection that provides direct data feed customers with the current Top of Book in the BX execution system. BX Options GLIMPSE for Top of Market (BX Top) 1.0 uses the same data formats as the BX Options Top of Market (BX Top) 2.0 data feed product.

2 Architecture

BX Options GLIMPSE for Top of Market (BX Top)is a point-to-point data feed product comprised of a series of sequenced messages. Each message is variable in length based on the message type. The messages that make up the BX Options GLIMPSE for Top of Market (BX Top) 1.0 protocol are typically delivered using a higher level protocol that takes care of sequencing and delivery guarantees.

BX currently offers the Options GLIMPSE data feed in the SoupBinTCP protocol option only. Please note that GLIMPSE users must login to SoupBinTCP for sequence 1 to correctly receive data.

3 Data Types

All Alpha or Alphanumeric fields are left justified and padded on the right with spaces.

All Integer fields are unsigned big-endian (network byte order) binary encoded numbers unless otherwise specified. Integers may be 1, 2 or 4 bytes long.

Prices are 2 byte or 4 byte Integer fields. 2 byte Price fields are unsigned positive numbers. 4 byte Price fields are signed positive numbers. When a 4 byte price is converted to a decimal format, prices are in fixed point format with 6 whole number places followed by 4 decimal digits. When a 2 byte price is converted to a decimal format, prices are in fixed point format with 3 whole number places followed by 2 decimal digits.

4 Message Formats

Upon logon to the BX Options GLIMPSE service, firms will receive the following data elements with the relevant system time stamp:

- System Event messages;
- Derivative Directory messages for all security symbols in the BX execution system;
- Trading Action messages with the current trading state value for active security symbol in the BX execution system;
- Best Bid and Offer Quotations indicating the best bid and offer position, with aggregated size, based on displayable order and quote interest in the BX Options execution system at the time of login request;
- Glimpse Snapshot message that reflects the BX Options Top of Market (BX Top) sequence number at the time that the BX Options Glimpse for Top of Market (BX Top) 1.0 spin was requested;
- BX Options Top of Market (BX Top) transmit trade information. Trades are not sent by BX Options Glimpse for Top of Market (BX Top) 1.0.

Please note that BX Options GLIMPSE for Top of Market (BX Top) 1.0 uses the same Derivative Directory, Trading Action, Best Bid AND Ask and Best Bid OR Ask message formats as the BX Options Top of Market (BX Top) data feed.

At the end of the spins, BX Options GLIMPSE for Top of Market (BX Top) will send a Snapshot message to denote where firms should begin processing real-time updates via the BX Top of Market (BX Top) product.

4.1 System Event Message

The system event message type is used to signal a market or data feed handler event. The format is as follows:

System Event Message				
NAME	**OFFSET**	**LENGTH**	**VALUE**	**NOTES**
Message Type	0	1	Alpha	“S” = System Event Message
Tracking Number	1	2	Integer	Internal system tracking number
Timestamp	3	8	Integer	Nanoseconds since midnight
Event Code	11	1	Alpha	Refer to System Event Codes below

System Event Codes		
CODE	**EXPLANATION**	**WHEN (TYPICALLY)**
"O"	Start of Messages. This is always the first message sent in any trading day.	After ~2:00am
"S"	Start of System Hours. This message indicates that the exchange is open and ready to start accepting orders.	7:00am
"Q"	Start of Opening Process. Thismessageis intended to indicatethat the exchange hasstarted itsopening auction process.	9:30:00am
"N"	End of Normal 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 normal trading hours.	4:00:00pm
"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
"E"	End of System Hours. This message indicates that the exchange system is now closed.	~5:15pm
"C"	End of Messages. This is always the last message sent in any trading day.	~5:20pm

4.2 Administrative Messages

4.2.1 Derivative Directory Messages

At the start of each GLIMPSE transmission, BX will disseminate derivative directory messages for all symbols in BX execution system for the current trading day. Please note that the derivative Directory spin may include halted issues. Firms must process the Trading Action message for current trading state information.

Notes on the Derivative Directory Messages:

- The Derivative 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. In the case of an intra-day update, for a given Option Id, the canonical information for the option is invariant (will not change). The canonical information consists of Security Symbol, Expiration Year Month and Day, Strike Price and Option Type. Other attributes for the Option may change.
- Firms should note that they will only receive Derivative Directory messages for the symbol range associated with the matching engine serving that connection.
- The Underlying Symbol is in most cases the same as the industry standard ticker underlying. In rare cases, such as a special settlement symbol, the exchange assigns unique underlying symbols.
- If an Option is removed from the system intra-day, a new options directory message will be sent with “Tradable” field set to “N”. Any Quotes sent for this removed Option will be rejected. All existing quotes for this option will be purged.
- The Minimum Price Variation (MPV) has the following values:
  - “E” – All prices are in penny increments
  - “S” – Prices below $3.00 are in increments of $0.05, prices above $3.00 are in increments of $0.10
  - “P” – Prices below $3.00 are in increments of $0.01, prices above $3.00 are in increments of $0.05
- The symbol directory message is transmitted in both the “Q” and “T” groups.

Derivative Directory Message				
NAME	**OFFSET**	**LENGTH**	**VALUE**	**NOTES**
Message Type	0	1	Alpha	“R” = Directory Message
Tracking Number	1	2	Integer	Internal system tracking number
Timestamp	3	8	Integer	Nanoseconds since midnight
Instrument ID	11	4	Integer	Option ID assigned daily. Valid for trading day
Security Symbol	15	6	Alphanumeric	Denotes the security symbol.
Expiration Year	21	1	Integer	Last two digits of the year of the option expiration
Expiration Month	22	1	Integer	Expiration Month (1-12)
Expiration Date	23	1	Integer	Day of the Month of expiration (1-31)
Explicit Strike Price	24	4	Integer	Explicit strike price. Refer to Data Types for field processing notes.
Option Type	28	1	Alpha	“C” = Call option “P” = Put option “N”= N/A

Derivative Directory Message				
NAME	**OFFSET**	**LENGTH**	**VALUE**	**NOTES**
Underlying Symbol	29	13	Alphanumeric	Denotes the unique symbol assigned to the underlying security.
Closing Type	42	1	Alphabetic	Denotes which System Event is used to trigger the instrument closing process. "N" = Normal Hours "L" = Late Hours
Tradable	43	1	Alpha	Denotes whether or not this instrument is tradable at the exchange. The allowable values are: "Y" = Instrument is tradable "N" = Instrument is not tradable
MPV	44	1	Alpha	Minimum Price Variation for instrument. See Notes below for further explanation: "E" = penny Everywhere "S" = Scaled "P" = penny Pilot
ISIN	45	12	Alphanumeric	International Securities Identification Number for instrument **Not supported on BX Options. Always set to '0'**
Tick Size Table ID	57	2		Tick Size ID for instrument **Not supported on BX Options. Always set to '0'**
Price notation	59	1	Alpha	The price notation of the order book. **Not supported on BX Options. Always set to '0'**
Volume notation	60	1	Alpha	The Volume notation of the order book **Not supported on BX Options. Always set to '0'**
Financial Product	61	2	Integer	Type of Financial Product **Not supported on BX Options. Always set to '0'**
Market segment Id	63	1	Alpha	Market identifier **Not supported on BX Options. Always set to '0'**
Trading Currency	64	3	Alpha	Currency of the trading instrument **Not supported on BX Options. Always set to '0'**
MIC	67	4	Alpha	Market Identifier Code identifying the Exchange. **Not supported on BX Options. Always set to '0'**
Instrument Long Name	71	16	Alpha	Instrument long name **Not supported on BX Options. Always set to '0'**

4.2.2 Trading Action Message

BX uses this administrative message to indicate the current trading status of an index or equity option within the BX Options Market.

In the GLIMPSE transmission, BX will send out a Trading Action spin. In the spin, BX will send out an Option Trading Action message with the "T" (Trading Resumption) for all options contracts that are eligible for trading during the current trading session.

For most options, the Trading State would be "T" (Trading Resumption) to reflect the option was released for trading during the current market session.

If the symbol was in a halted state at the time of the GLIMPSE transmission, the Trading State will reflect with the code 'H' as outlined below.

If an option is temporarily suspended on buy or sell side (i.e. all buy orders or all sell orders in a given symbol are not executable), a trading action message with state 'B' (for buy side) or 'S' (for sell side) will be sent.

If the GLIMPSE transmission includes an Option Directory message, but not a Option Trading Action message, for an option, firms may assume that the option was placed in an operational or regulatory trading halt prior to the start of the current trading system.

Trading Action Message

Field Name	Offset	Length	Value	Notes
Message Type	0	1	Alpha	"H" = Trading Action Message
Tracking Number	1	2	Integer	Internal system tracking number
Timestamp	3	8	Integer	Nanoseconds since midnight
Instrument Id	11	4	Integer	Option ID assigned daily. Valid for trading day
Current Trading State	15	1	Alphabetic	Reflects the current trading state for the derivative.Theallowablevalues are: "H" = Halt in effect "B" = Buy Side Trading Suspended –i.e. Buy orders are not executable) "S" = Sell Side Trading Suspended –i.e. Sell orders are not executable) "I" = Pre Open "O" = Opening Auction "R" = Re-Opening "T" = Continuous Trading "X" = Closed

This message is transmitted in both the "Q" and "T" groups.

4.3 Best Bid AND Ask Update – Short Form

The quote will reflect the latest, highest price displayable in the options system for buy orders/quotes and the lowest price displayable in the options system for sell orders/quotes at the time of the Glimpse snapshot.

The Quote Condition applies to both the bid and ask sides.

There are two forms of the Best Bid AND Ask Update, the Short Form has Prices and Sizes in 2 byte Integer fields. Note that 2 byte Prices are in pennies and does not imply a loss of precision in the price.

Best Bid AND Ask Update – Short Form Message				
Name	**Offset**	**Length**	**Value**	**Notes**
Message Type	0	1	Alpha	"q" = Best bid AND ask update
Tracking Number	1	2	Integer	Internal system tracking number
Timestamp	3	8	Integer	Nanoseconds since midnight
Instrument ID	11	4	Integer	Option ID assigned daily. Valid for trading day
Quote Condition	15	1	Alpha	<space> = regular quote/autox eligible "X" = Ask side not firm bid side firm "Y" = Bid side not firm, ask side firm
Bid Market Order Size	16	2	Integer	Number of market order contracts on the bid side
Bid Price	18	2	Integer	Best bid price in fixed point format with 3 whole number places followed by 2 decimal digits
Bid Size	20	2	Integer	Aggregated number of contracts on the bid side being displayed in the options market at the current time.
Bid Cust Size	22	2	Integer	Customer quantity on the bid side. **Not supported on BX Options. Always set to '0'**
Bid ProCust Size	24	2	Integer	Customer professional quantity on the bid side. **Not supported on BX Options. Always set to '0'**
Ask Market Order Size	26	2	Integer	Number of market order contracts on the ask side
Ask Price	28	2	Integer	Best ask price in fixed point format with 3 whole number places followed by 2 decimal digits
Ask Size	30	2	Integer	Aggregated number of contracts on the ask side being displayed in the options market at the current time.
Ask Cust Size	32	2	Integer	Customer quantity on the ask side. **Not supported on BX Options. Always set to '0'**
Ask ProCust Size	34	2	Integer	Customer professional quantity on the ask side. **Not supported on BX Options. Always set to '0'**

4.4 Best Bid AND Ask Update – Long Form

This message is the same as the Best Bid AND Ask Update Message – Short Form described above except that Prices and Sizes are 4 byte Integers, the price having 4 implied decimal places.

Best Bid AND Ask Update – Long Form Message

Name	Offset	Length	Value	Notes
Message Type	0	1	Alpha	"Q" = Best bid AND ask update
Tracking Number	1	2	Integer	Internal system tracking number
Timestamp	3	8	Integer	Nanoseconds since midnight
Instrument ID	11	4	Integer	Option ID assigned daily. Valid for trading day
Quote Condition	15	1	Alpha	<space> = regular quote/autox eligible "X" = Ask side not firm bid side firm "Y" = Bid side not firm, ask side firm
Bid Market Order Size	16	4	Integer	Number of market order contracts on the bid side
Bid Price	20	4	Integer	Best bid price in fixed point format with 6 whole number places followed by 4 decimal digits.
Bid Size	24	4	Integer	Aggregated number of contracts on the bid side being displayed in the options market at the current time.
Bid Cust Size	28	4	Integer	Customer quantity on the bid side. **Not supported on BX Options. Always set to '0'**
Bid ProCust Size	32	4	Integer	Customer professional quantity on the bid side. **Not supported on BX Options. Always set to '0'**
Ask Market Order Size	36	4	Integer	Number of market order contracts on the ask side
Ask Price	40	4	Integer	Best ask price in fixed point format with 6 whole number places followed by 4 decimal digits.
Ask Size	44	4	Integer	Aggregated number of contracts on the ask side being displayed in the options market at the current time.
Ask Cust Size	48	4	Integer	Customer quantity on the ask side. **Not supported on BX Options. Always set to '0'**
Ask ProCust Size	52	4	Integer	Customer professional quantity on the ask side. **Not supported on BX Options. Always set to '0'**

This message is transmitted in the "Q" group only.

4.5 Best Bid OR Ask Update – Short Form

The quote will reflect the latest, highest price displayable in the options system for buy orders/quotes or the lowest price displayable in the options system for sell orders/quotes at the time of the Glimpse snapshot.

For the bid or ask update received, the data feed recipient firm should adjust the quotation bid or ask side only for the market side indicated in the message.

For an option with a displayable best bid and offer quote, either the two-sided Best Bid AND Ask Update message will be received, or two one-sided (Best Bid OR Ask Update) quotes will be received. The only difference in the two scenarios is that the two one-sided quotes will have a different time associated with the bid and ask sides.

There are two forms of the Best Bid OR Ask Update, the Short Form has Price and Size in 2 byte Integer fields. Note that 2 byte Price is in pennies and does not imply a loss of precision in the price.

Best Bid OR Ask Update – Short Form Message

Name	Offset	Length	Value	Notes
Message Type	0	1	Alpha	Best bid OR ask update: "b" = Quote update bid side "a" = Quote update ask side
Tracking Number	1	2	Integer	Internal system tracking number
Timestamp	3	8	Integer	Nanoseconds since midnight
Instrument ID	11	4	Integer	Option ID assigned daily. Valid for trading day
Quote Condition	15	1	Alpha	<space> = regular quote/autox eligible "X" = Ask side not firm bid side firm "Y" = Bid side not firm, ask side firm
Market Order Size	16	2	Integer	Number of market order contracts on the bid or ask side
Price	18	2	Integer	Best bid or ask price in fixed point format with 3 whole number places followed by 2 decimal digits
Size	20	2	Integer	Aggregated number of contracts on the bid or ask side being displayed in the options market at the current time.
Cust Size	22	2	Integer	Customer quantity on the bid or ask side. **Not supported on BX Options. Always set to '0'**
ProCust Size	24	2	Integer	Customer professional quantity on the bid or ask side. **Not supported on BX Options. Always set to '0'**

4.6 Best Bid OR Ask Update – Long Form

This message is the same as the Best Bid OR Ask Update Message – Short Form described above except that Prices and Sizes are 4 byte Integers, the price having 4 implied decimal places.

Best Bid OR Ask Update – Long Form Message				
Name	**Offset**	**Length**	**Value**	**Notes**
Message Type	0	1	Alpha	Best bid OR ask update: “B” = Quote update bid side “A” = Quote update ask side
Tracking Number	1	2	Integer	Internal system tracking number
Timestamp	3	8	Integer	Nanoseconds since midnight
Instrument ID	11	4	Integer	Option ID assigned daily. Valid for trading day
Quote Condition	15	1	Alpha	<space> = regular quote/autox eligible “X” = Ask side not firm bid side firm “Y” = Bid side not firm, ask side firm
Market Order Size	16	4	Integer	Number of market order contracts on the bid or ask side
Price	20	4	Integer	Best bid or ask price in fixed point format with 6 whole number places followed by 4 decimal digits, the side determined by Message Type.
Size	24	4	Integer	Aggregated number of contracts on the bid or ask side being displayed in the options market at the current time.
Cust Size	28	4	Integer	Customer quantity on the bid or ask side. **Not supported on BX Options. Always set to ‘0’**
ProCust Size	32	4	Integer	Customer professional quantity on the bid or ask side. **Not supported on BX Options. Always set to ‘0’**

5 Snapshots Message

The Snapshot message reflects the BX Options Top of Market (BX Top) 2.0 sequence number at the time that the BX Options GLIMPSE for BX Top of Market 1.0 spin was requested.

To maintain a real-time order display, firms should begin to process real-time BX Options Top of Market messages beginning with the sequence number stated in this BX Options GLIMPSE for BX Top of Market 1.0 snapshot message.

Snapshot Message				
Name	**Offset**	**Length**	**Value**	**Notes**
Message Type	0	1	Alpha	"M" = End of Snapshot message
Sequence Number	1	20	Numeric	BX Options Top of Market sequence number when the BX GLIMPSE for Top of Market snapshot was taken. To keep the order book current, firms should process real-time BX Options Top of Market messages beginning with the message sequence number reflected in this snapshot message. Note: While BX Options Top of Market 2.0 is a binary data feed, the SoupBinTCP protocol uses ASCII characters for the sequence number in the logon request message format.

6 Support

- For general product support for Nasdaq data feeds, please contact Clientsuccess@nasdaq.com.
- For technical support for Nasdaq data feeds, please contact Nasdaq Systems Engineering at devsupport@nasdaq.com.