

MRX Top of Market Glimpse Feed

Version 2.02

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1. Overview

A complement to the MRX Top of Market real-time data feed product, GLIMPSE for MRX 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 MRX execution system. GLIMPSE for MRX Top of Market uses the same data formats as the MRX Top of Market data feed product.

2. Architecture

GLIMPSE for MRX Top of Market (MRX 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 MRX GLIMPSE for Top of Market (MRX Top) protocol are typically delivered using a higher level protocol that takes care of sequencing and delivery guarantees.

MRX 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, 4 or 8 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 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

This feed supports the following types of messages:

- System Events
- Derivative Directory messages
- Trading Action messages
- Best bid and offer updates
- Glimpse Snapshot message that reflects the MRX Options Top of Market (MX Top) sequence number at the time that the MRX Options Glimpse for Top of Market (MX Top) spin was requested

MRX Options Top of Market (MRX Top) transmit trade information. Trades are not sent by MRX Options Glimpse for Top of Market (MRX Top).

Please note that MRX Options GLIMPSE for Top of Market (MRX Top) 1.0 uses the same Derivative Directory, Trading Action, Best Bid AND Ask and Best Bid OR Ask message formats as the MRX Options Top of Market (MRX Top) data feed. At the end of the spins, MRX Options GLIMPSE for Top of Market (MRX Top) will send a Snapshot message to denote where firms should begin processing real-time updates via the MRX Top of Market (MRX Top) product.

Within the system event and administrative types, the options system may support multiple message formats as outlined below.

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 ~12:30am |
| "S" | Start of System Hours. This message indicates that the options system is open and ready to start accepting orders. | After Start of Messages and before Start of Currency Opening Process |
| "Q" | Start of Opening Process. This message is intended to indicate that the options system has started its opening auction process. | 9:30:00am |
| "N" | Start of Normal Hours Closing Process. This message is intended to indicate that the options system will no longer generate new executions for options that trade during normal hours. | 4:00:00pm |
| "L" | Start of Late Hours Closing Process. This message is intended to indicate that the options system will no longer generate new executions for options that trade during extended hours. | 4:15:00pm |
| "E" | End of System Hours. This message indicates that the options system is now closed. | ~5:15pm |
| "C" | End of Messages. This is always the last message sent in any trading day. | ~5:20pm |
| "W" | End of WCO Early closing. 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. | 12:00 Noon |

4.2. Administrative Messages

4.2.1. Derivative Directory Message

At the start of each trading day, Nasdaq disseminates options symbol directory messages for all active options symbols in the system.

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

Derivative Directory Message

| Name | Offset | Length | Value | Notes |
|-----------------------|--------|--------|--------------|---|
| Message Type | 0 | 1 | Alpha | “V” = Directory Message |
| Tracking Number | 1 | 2 | Integer | Internal System tracking number |
| Timestamp | 3 | 8 | Integer | The time, expressed as the number of nanoseconds after midnight. |
| Instrument ID | 11 | 4 | Integer | Integer ID of the option, as defined in the Options Directory Message. |
| Security Symbol | 15 | 6 | Alphanumeric | Denotes the option root symbol (security symbol) |
| Expiration Year | 21 | 1 | Integer | Last two digits of the year of the option expiration |
| Expiration Month | 22 | 1 | Integer | Expiration Month of the option (1-12) |
| Expiration Day | 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” = Not Applicable |
| Underlying Symbol | 29 | 13 | Alpha | Denotes the unique symbol assigned to the underlying security within the Exchange System. |
| Closing Type | 42 | 1 | Alpha | Denotes which System Event is used to determine when trading ceases in this symbol. “N” = Normal Hours “L” = Late Hours “W” = WCO Early Closing at 12:00 |
| Tradable | 43 | 1 | Alpha | Denotes whether or not this option is tradable at the exchange: “Y” = Option is tradable “N” = Option is not tradable |
| MPV | 44 | 1 | Alpha | Minimum Price Variation for this option: “E” = penny Everywhere “S” = Scaled “P” = penny Pilot |

422. Trading Action Message

The options system uses this administrative message to indicate the current trading status of an index or equity option within the options market.

The Options Trading Action message will be used to indicate the current trading state of the instrument as it transitions through the various states during the trading session. It will begin with Pre Open state if it is eligible for trading. The states Opening and Re-Opening indicate that the instrument is undergoing an auction prior to it moving into Continuous Trading state. Buy Side and Sell Side Trading Suspended states are special cases of Continuous Trading. The instrument transitions to Closed state at the end of trading hours. At any point before the Closed state the instrument can enter the Halted state for regulatory or operational reasons.

After the start of system hours, Nasdaq will use the Trading Action message to relay changes in trading status for an individual option. Messages will be sent when an option: is halted, is released for quotation, released for trading, or temporarily suspended for trading on the buy or sell side.

Trading Action Message

| Name | Offset | Length | Value | Notes |
|-----------------------|--------|--------|---------|---|
| Message Type | 0 | 1 | Alpha | "H" = Trading Action |
| Tracking Number | 1 | 2 | Integer | Internal System Tracking number |
| Timestamp | 3 | 8 | Integer | The time, expressed as the number of nanoseconds after midnight. |
| Instrument ID | 11 | 4 | Integer | Integer ID of the option, as defined in the Options Directory Message. |
| Current Trading State | 15 | 1 | Alpha | Reflects the current trading state for the options security in the options market. The allowable values are: "B"=Buy Side Suspended "S" =Sell-Side Suspended "H" = Halt in effect "T" = Continuous Trading "I" = Pre-Open "O" = Opening Auction "R" = Re-Opening "X" = Closed |

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

4.3. Best Bid AND Ask Update – Short Form

The options system will continuously calculate its best bid and offer position for active options contracts on the options market during the trading day. Whenever the best bid and ask position changes on both sides, the options system will send its best bid and ask update via the data feed for the affected security. A change in bid or ask implies a change in price and/ or size. The quote will reflect the highest price displayable in the options system for buy orders/quotes and the lowest price displayable in the options system for sell orders/quotes.

If only one side of the quote changes, Best Bid OR Ask Update message will be sent for bandwidth efficiency reasons. 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 message will only be sent after an option is open for trading.

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 | Instrument 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. |
| Bid ProCust Size | 24 | 2 | Integer | Customer professional quantity on the bid side. |
| 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. |
| Ask ProCust Size | 34 | 2 | Integer | Customer professional quantity on the ask side. |

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 message will only be sent after an option is open for trading.

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 | Instrument 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. |
| Bid ProCust Size | 32 | 4 | Integer | Customer professional quantity on the bid side. |
| 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. |
| Ask ProCust Size | 52 | 4 | Integer | Customer professional quantity on the ask side. |

4.5. Best Bid OR Ask Update – Short Form

The options system will continuously calculate its best bid and offer position for active options contracts on the options market during the trading day. Whenever the best bid or ask position changes on one side but not the other side, the options system will send its best bid or ask update via this feed for the affected security. A change in bid or ask implies a change in price and/or size. The quote will reflect the highest price displayable in the options system for buy orders/quotes and the lowest price displayable in the options system for sell orders/quotes.

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. Implicitly the opposite side has the same price and size as previously displayed.

If both bid and ask change as one update, the Best Bid AND Ask Update message will be sent, displaying both sides of the quote simultaneously.

The Quote Condition applies to both 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 message will only be sent after an option is open for trading.

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 | Instrument 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. |
| ProCust Size | 24 | 2 | Integer | Customer professional quantity on the bid or ask side. |

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 message will only be sent after an option is open for trading.

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 | Instrument 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. |
| ProCust Size | 32 | 4 | Integer | Customer professional quantity on the bid or ask side. |

4.7. Snapshot Message

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

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

Snapshot Message

| Name | Offset | Length | Value | Notes |
|-----------------|--------|--------|---------|--|
| Message Type | 0 | 1 | Alpha | "M" = End of Snapshot Message Top of Market Feed sequence number when the Glimpse snapshot was taken. |
| Sequence Number | 1 | 20 | Numeric | To keep the stream current, process the Top of Market Feed messages beginning with the message sequence number in this snapshot message. Note: While Top of Market Feed is a binary data feed, the SoupBINTCP protocol uses ASCII characters for the sequence number in the logon request message format. |

5. Support

- For general product support for Nasdaq data feeds, please contact Nasdaq Market Data at clientsuccess@nasdaq.com.
- For technical support for Nasdaq data feeds, please contact Nasdaq Systems Engineering at OptionsHelpdesk@nasdaq.com.

6. Document History

| Revision | Published | Author(s) | Summary of Changes |
|--------------|-----------------|-----------|--|
| Version 2.0 | March 16, 2022 | | <ul style="list-style-type: none">• Initial Draft |
| Version 2.01 | June 16, 2022 | | <ul style="list-style-type: none">• Updated the Trading Action Message with the following enumerations added to the Current Trading State Field:<ul style="list-style-type: none">○ "B"=Buy Side Suspended○ "S"=Sell-Side Suspended |
| Version 2.02 | January 9, 2023 | | <ul style="list-style-type: none">• Version updated to 2.02• Clarifying the Data Types: Added "2 byte price fields are unsigned positive numbers. 4 byte price fields are signed positive numbers." |
| Version 2.02 | April 6, 2023 | | <ul style="list-style-type: none">• Corrected the Data Types: Changed "4 byte price fields are signed positive numbers." to "4 byte price fields are signed numbers". |