# XDP INTEGRATED FEED CLIENT SPECIFICATION

**NYSE Arca Integrated, Pillar Architecture 1Q16**

Version
1.16

Date
November 12, 2015

## PREFACE

**DOCUMENT HISTORY**

The following table provides a description of all changes to this document.

| VERSION NO. | DATE | CHANGE DESCRIPTION |
|---|---|---|
| 1.7 | 05/21/12 | Updated references to NYSE MKT |
|  | 08/14/2012 | Rebranded with new NYSE Technologies template |
| 1.8 | 04/08/2013 | Addition of ArcaEdge Integrated Feed messages |
| 1.9 | 05/07/2013 | Removal of ArcaEdge Integrated Feed messages. Removal of Add Order Attributed Messages and removal of Add Refresh Order Attributed Messages. |
| 1.10 | 05/28/2013 | Removal of ArcaEdge Integrated Feed Messages. Addition of Add Order Attributed Messaged and Add Refresh Order Attributed Messages. |
| 1.11 | 06/13/2013 | Removal of ReasonCode fields from Execution Message Msg Type '103' |
| 1.12 | 08/30/2013 | Message Type 105 amended to state that total volume could be negative |
| 1.13 | 09/12/2013 | Addition of '9' – Corrected Last Sale Price in Table 11, TradeCond2. Updated the description "I" in Table 11, TradeCon4 to Odd Lot Trade |
| 1.13a | 10/01/2013 | Section 1.5 Trading Sessions: amended all times listed as 4:15pm to 4:00pm |
| 1.13b | 03/26/2014 | Added note to Attributed Add Order Message and Attributed Add Order Refresh message stating these are future enhancements. |
| 1.13c | 11/03/2014 | Removed future enhancement notes from Attr Add, Attr Add Refresh. Fixed imbalance times. Removed references to NYSE & NYSE MKT (these are moving to v 2.0) |
| 1.14 | 02/04/2015 | Addition of support for Global OTC |
| 1.15 | 06/18/2015 | For OTC, renamed Unsolicited to Flags, converted it to a bit field; added Flags to Attributed messges (107 & 108) |
| 1.15a | 07/10/2015 | Updated legal disclaimer for Global OTC on title page |
| 1.15b | 07/24/2015 | Corrected publication times |
| 1.16 | 11/06/2015 | Revisions for Pillar architecture, removed OTC, which will not migrate to Pillar |

**REFERENCE MATERIAL**

The following lists the associated documents, which either should be read in conjunction with this document or which provide other relevant information for the user:

- XDP Common Client Specification

- SFTI US Technical Specification

- SFTI US Customer Guide

- NYSE Symbology

**CONTACT INFORMATION**

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**FURTHER INFORMATION**

For additional information about the product, visit the XDP Integrated Feed Product Page

For updated capacity figures, visit our capacity pages at: http://www.nyxdata.com/capacity

For details of IP addresses, visit our IP address pages at: http://www.nyxdata.com/ipaddresses

For a full glossary, visit: http://www.nyxdata.com/glossary/

# CONTENTS

# 1.    XDP INTEGRATED FEED ORDER BOOK INFORMATION

## 1.1    OVERVIEW

The XDP Integrated feed provides a raw feed of the Exchange's order book for all traded securities. Traders will see the complete depth of book, all trade events, the stock security status, and stock imbalances.  All of the data is sent in the order in which it occurs in the Matching Engine.

All message types defined in this document appear only in the main publication channels, except:

- The Imbalance and Add Order Refresh message types also appear in the Refresh channels.
- The Stock Summary message appears only in a dedicated Stock Summary channel.

## 1.2    PUBLICATION TIMES

### Table 1 Normal Trading Days (all times are EST)

| MSGTYPE | DESCRIPTION | NYSE ARCA |
|---------|-------------|-----------|
| 100 | Add Order Message | 4:00am − 8:00pm |
| 107 | Order Book Attributed Add Order Message | − |
| 101 | Modify Order Message | 4:00am − 8:00pm |
| 102 | Delete Order Message | 4:00am − 8:00pm |
| 103 | Execution Message | 4:00am − 8:00pm |
| 105 | Imbalance Message | 8:30am-Stock Open, 3:45pm- 4pm |
| 106 | Order Book Add Order Refresh Message | 4am − 8pm |
| 108 | Order Book Attributed Add Order Refresh Message | − |
| 220 | Trade Message | 4:00am − 8:00pm |
| 221 | Trade Cancel or Bust Message | 4:00am − 8:00pm |
| 222 | Trade Correction Message | 4:00am − 8:00pm |
| 223 | Stock Summary Message | 4:00am − 8:00pm |

### Table 2 Early Closing Days (all times are EST)

| MSGTYPE | DESCRIPTION | NYSE ARCA |
|---------|-------------|-----------|
| 100 | Add Order Message | 4am − 1pm |
| 107 | Order Book Attributed Add Order Message | − |
| 101 | Modify Order Message | 4am − 1pm |
| 102 | Delete Order Message | 4am − 1pm |
| 103 | Execution Message | 4:00am − 1pm |

| MSGTYPE | DESCRIPTION | NYSE ARCA |
|---------|-------------|-----------|
| 105 | Imbalance Message | 8:30am-Stock Open, 12:45pm -1pm |
| 106 | Order Book Add Order Refresh Message | – |
| 108 | Order Book Attributed Add Order Refresh Message | 3:30am – 4:15pm |
| 220 | Trade Message | 4:00am – 1:00pm |
| 221 | Trade Cancel or Bust Message | 4:00am – 1:00pm |
| 222 | Trade Correction Message | 4:00am – 1:00pm |
| 223 | Stock Summary Message | 4:00am – 1:00pm |

### 1.3    CONTROL MESSAGE TYPES

**Table 3 Control Message Types used in the Data Feed**

| MSGTYPE | DESCRIPTION |
|---------|-------------|
| 1 | Sequence Number Reset |
| 2 | Time Reference Message |
| 3 | Symbol Index Mapping |
| 10 | Retransmission Request Message |
| 11 | Request Response Message |
| 12 | Heartbeat Response Message |
| 13 | Symbol Index Mapping Request Message |
| 15 | Refresh Request Message |
| 31 | Message Unavailable |
| 32 | Symbol Clear |
| 33 | Trading Session Change |
| 34 | Security Status Message |
| 35 | Refresh Header Message |

## 1.4    REFRESH MESSAGE TYPES

### Table 4 Refresh  Message Types used in the Refresh Feed

| MSGTYPE | DESCRIPTION |
| --- | --- |
| 35 | Refresh Header Message |
| 3 | Symbol Index Mapping |
| 105 | Imbalance Message |
| 34 | Security Status Message |
| 33 | Trading Session Change |
| 106 | Order Book Add Order Refresh Message |
| 108 | Order Book Attributed Add Order Message |

## 1.5    TRADING SESSIONS

### Table 5 Trading Sessions (all times are EST)

| SESSION VALUE | DESCRIPTION | NYSE ARCA |
| --- | --- | --- |
| 0x01 | Morning Hours | 4:00am – 9:30am |
| 0x02 | National Hours | 9:30am – 4:00pm |
| 0x04 | Late Hours | 4:00pm – 8:00pm |

## 2.    ORDER BOOK ADD ORDER MESSAGE – MSG TYPE '100'

An Add Order message is published when a new visible order has been added to the book.

Note that when an order received by the matching engine is marked for a future session, it is not added to the order book, and no Add Order message is immediately published.  Upon transition to the relevant future session, all such orders are added to the book, and Add Order messages are sent for them all at that time.

See the XDP Common Client Specification for details on Time Reference and Symbol Index Mapping messages, and Order ID and Price field formats.

| FIELD NAME | OFFSET | SIZE (BYTES) | FORMAT | DESCRIPTION |
|---|---|---|---|---|
| Msg Size | 0 | 2 | Binary | Size of the message: 31 Bytes |
| Msg Type | 2 | 2 | Binary | This field identifies the type of message. 100 – Add Order Message |
| SourceTimeNS | 4 | 4 | Binary | This field represents the nanosecond offset from the time reference second in UTC time (EPOCH) |
| SymbolIndex | 8 | 4 | Binary | This field identifies the numerical representation of the symbol. |
| SymbolSeqNum | 12 | 4 | Binary | This field contains the symbol sequence number |
| OrderID | 16 | 4 | Binary | The Order ID identifies a unique order. |
| Price | 20 | 4 | Binary | The price point. Use the Price scale from the symbol-mapping index. |
| Volume | 24 | 4 | Binary | This field contains the order quantity in shares |
| Side | 28 | 1 | ASCII | This field indicates the side of the order Buy/Sell. Valid values:<br>■ 'B' – Buy<br>■ 'S' – Sell |
| OrderIDGTCIndicator | 29 | 1 | Binary | This field specifies if Trade Order ID is a GTC order:<br>■ '0' – Day Order<br>■ '1'- GTC Order |
| TradeSession | 30 | 1 | Bit Field | Values:<br>■ 0x01  Ok for morning hours<br>■ 0x02  Ok for national hours (core)<br>■ 0x03 OK for morning and core<br>■ 0x04  Ok for late hours<br>■ 0x06 OK for core and late<br>■ 0x07 OK for morning, core, and late |

## 3.    ORDER BOOK ATTRIBUTED ADD ORDER MESSAGE – MSG TYPE '107'

**NOTE:** This message type is left as a future enhancement for NYSE Arca. The current production Arca Integrated Feed does not send this message type.

| FIELD NAME | OFFSET | SIZE (BYTES) | FORMAT | DESCRIPTION |
|---|---|---|---|---|
| Msg Size | 0 | 2 | Binary | The size of the message: 36 Bytes |
| Msg Type | 2 | 2 | Binary | This field identifies the type of message. 107 – Attributed Add Order Message |
| SourceTimeNS | 4 | 4 | Binary | This field represents the nanosecond offset from the time reference second in UTC time (EPOCH) |
| SymbolIndex | 8 | 4 | Binary | This field identifies the numerical representation of the symbol. |
| SymbolSeqNum | 12 | 4 | Binary | This field contains the symbol sequence number |
| OrderID | 16 | 4 | Binary | The Order ID identifies a unique order |
| Price | 20 | 4 | Binary | This field contains the price point. Use the Price scale from the symbol-mapping index. |
| Volume | 24 | 4 | Binary | This field contains the order quantity in shares |
| Side | 28 | 1 | ASCII | This field indicates the side of the order Buy/Sell. Valid values: ■ 'B' – Buy ■ 'S' – Sell |
| OrderIDGTCIndicator | 29 | 1 | Binary | This field specifies if Trade Order ID is a GTC order: ■ '0' – Day Order ■ '1'- GTC Order |
| TradeSession | 30 | 1 | Bit Field | Values: ■ 0x01  Ok for morning hours ■ 0x02  Ok for national hours (core) ■ 0x03 OK for morning and core ■ 0x04  Ok for late hours ■ 0x06 OK for core and late ■ 0x07 OK for morning, core, and late |
| FirmID | 31 | 5 | ASCII | This field provides market participant's firm ID |

# 4.    ORDER BOOK MODIFY MESSAGE – MSG TYPE '101'

XDP Integrated feed sends this message when an order in the Order Book is modified. The Order ID refers to the original order sent in the add order message. The following events trigger a modify order message.

- The price of an order changes
- The size of an order changes
- An order is routed to an away market with some shares remaining in the Order Book

**Note:** If an away market declines a partially routed order, a Modify Order message is published to "add" the declined shares back to the resting portion of the order in the Order Book.

| FIELD NAME | OFFSET | SIZE (BYTES) | FORMAT | DESCRIPTION |
|---|---|---|---|---|
| Msg Size | 0 | 2 | Binary | Size of the message: 31 Bytes |
| Msg Type | 2 | 2 | Binary | This field identifies the type of message. 101 – Modify Message |
| SourceTimeNS | 4 | 4 | Binary | This field represents the nanosecond offset from the time reference second in UTC time (EPOCH) |
| SymbolIndex | 8 | 4 | Binary | This field identifies the numerical representation of the symbol. |
| SymbolSeqNum | 12 | 4 | Binary | This field contains the symbol sequence number |
| OrderID | 16 | 4 | Binary | The Order ID identifies a unique order. |
| Price | 20 | 4 | Binary | This field contains the price point.  Use the Price scale from the symbol mapping index. |
| Volume | 24 | 4 | Binary | This field contains the order quantity in shares |
| Side | 28 | 1 | ASCII | This field indicates the side of the order Buy/sell. Valid values: ■ 'B' – Buy ■ 'S' – Sell |
| OrderIDGTCIndicator | 29 | 1 | Binary | This field specifies if Trade Order ID is a GTC order: ■ '0' – Day Order ■ '1'- GTC Order |
| ReasonCode | 30 | 1 | Binary | **Currently unused and defaulted to 0.** Modify Reason: ■ 5 – Change (lost position in book) ■ 6 – Routed (keep position in book) ■ 7 – Modify Fill keep position |

## 5. ORDER BOOK DELETE MESSAGE – MSG TYPE '102'

XDP Integrated feed sends this message when an order is taken off of the order book. The following events will trigger the transmission of a delete order message:

■ An order is cancelled

■ An order expires

■ An order is fully routed to an away market. **Note**: If the away market declines the Matching Engine preference, an Add Order message with the original Order ID will be sent to return the order to the Order Book.

| FIELD NAME | OFFSET | SIZE (BYTES) | FORMAT | DESCRIPTION |
|---|---|---|---|---|
| Msg Size | 0 | 2 | Binary | Size of the message: 23 Bytes |
| Msg Type | 2 | 2 | Binary | This field identifies the type of message. 102 – Delete Message |
| SourceTimeNS | 4 | 4 | Binary | This field represents the nanosecond offset from the time reference second in UTC time (EPOCH) |
| SymbolIndex | 8 | 4 | Binary | This field identifies the numerical representation of the symbol. |
| SymbolSeqNum | 12 | 4 | Binary | This field contains the symbol sequence number |
| OrderID | 16 | 4 | Binary | The Order ID identifies a unique order. |
| Side | 20 | 1 | ASCII | This field indicates the side of the order Buy/sell. Valid values: ■ 'B' – Buy ■ 'S' – Sell |
| OrderIDGTCIndicator | 21 | 1 | Binary | This field specifies if Trade Order ID is a GTC order: ■ '0' – Day Order ■ '1'- GTC Order |
| ReasonCode | 22 | 1 | Binary | **Currently unused and defaulted to 0.** Delete Reason: ■ 1 – User Cancel ■ 2 – Modify (taken off book, Order ID may add again) ■ 3 – Delete Filled |

## 6.     ORDER BOOK EXECUTION MESSAGE – MSG TYPE '103'

An Order Book Execution message is sent when a visible order is partially or fully executed.  The Volume field indicates the executed quantity.  If the Price field is different from the price of the order, any remaining shares keep their original price.  If the Volume field equals the number of shares previously remaining in the order, then the order has been fully executed and should be removed from the book.   If the order has been partially executed, further Order Execution messages for this Order ID may be published.

| FIELD NAME | OFFSET | SIZE (BYTES) | FORMAT | DESCRIPTION |
|---|---|---|---|---|
| Msg Size | 0 | 2 | Binary | Size of the message: 34 Bytes |
| Msg Type | 2 | 2 | Binary | This field identifies the type of message. 103 – Execution Message |
| SourceTimeNS | 4 | 4 | Binary | This field represents the nanosecond offset from the time reference second in UTC time (EPOCH) |
| SymbolIndex | 8 | 4 | Binary | This field identifies the numerical representation of the symbol. |
| SymbolSeqNum | 12 | 4 | Binary | This field contains the symbol sequence number |
| OrderID | 16 | 4 | Binary | The Order ID identifies a unique order. |
| Price | 20 | 4 | Binary | This field contains the price the order execution price.  Use the Price scale from the symbol mapping index. |
| Volume | 24 | 4 | Binary | This field contains the order quantity in shares |
| OrderIDGTCIndicator | 28 | 1 | Binary | This field specifies if executed Order is a GTC order: ■ '0' – Day Order ■ '1'- GTC Order |
| ReasonCode | 29 | 1 | Binary | Default: 0 See Section 6.1 for more information. |
| TradeID | 30 | 4 | Binary | The TradeID identifies a unique transaction in the matching engine and allows you to correlate Order Book Execution messages to Trade messages. |

### 6.1    ORDER BOOK EXECUTION MESSAGE SENDING RULES

If the reason codes are set to zero, signifying that this feature has not yet been implemented, then the feed will disseminate the following:

1. In the event an order is partially filled, the data feed will first send an execution message followed by a modify message for the Order ID that has been partially executed.

2. In the event an order is fully executed, the data feed will first send an execution message followed by a delete for the Order ID that has been fully executed.

If the reason codes are not set to zero, then the data feed will only send the execution message with the appropriate reason code when a trade occurs

3. In the event an order is partially filled, the execution message will show a reason code value of "7" requiring that the corresponding Order ID should have its volume reduced by the volume amount on the execution message.

4. In the event an order is fully executed, the data feed will send an execution message with a reason code value of "3". The corresponding Order ID should then be removed from the book since the volume has been fully executed.

## 7.   ORDER BOOK ADD ORDER REFRESH MESSAGE – MSG TYPE '106'

This message is published only during a refresh or after a symbol clear which will result in a book refresh.

| FIELD NAME | OFFSET | SIZE (BYTES) | FORMAT | DESCRIPTION |
|---|---|---|---|---|
| Msg Size | 0 | 2 | Binary | Size of the message: 35 Bytes (future release) |
| Msg Type | 2 | 2 | Binary | This field identifies the type of message. 106 – Add Order Refresh Message |
| SourceTime | 4 | 4 | Binary | This field specifies the time when the msg was generated in the order book. The number represents the number of seconds in UTC time |
| SourceTimeNS | 8 | 4 | Binary | This field represents the nanosecond offset from the time reference second in UTC time |
| SymbolIndex | 12 | 4 | Binary | This field identifies the numerical representation of the symbol. |
| SymbolSeqNum | 16 | 4 | Binary | This field contains the symbol sequence number |
| OrderID | 20 | 4 | Binary | The Order ID identifies a unique order. |
| Price | 24 | 4 | Binary | This field contains the price point.  Use the Price scale from the symbol-mapping index. |
| Volume | 28 | 4 | Binary | This field contains the order quantity in shares |
| Side | 32 | 1 | ASCII | This field indicates the side of the order Buy/sell. Valid values: ■ 'B' – Buy ■ 'S' – Sell |
| OrderIDGTCIndicator | 33 | 1 | Binary | This field specifies if Trade Order ID is a GTC order ■ '0' – Day Order ■ '1'- GTC Order |
| TradeSession | 34 | 1 | Bit Field | Values: ■ 0x01  Ok for morning hours ■ 0x02  Ok for national hours (core) ■ 0x03 OK for morning and core ■ 0x04  Ok for late hours ■ 0x06 OK for core and late ■ 0x07 OK for morning, core, and late |

## 8.    ORDER BOOK ATTRIBUTED ADD ORDER REFRESH MESSAGE – MSG TYPE '108'

The current production Arca Integrated Feed does not publish this message type.

| FIELD NAME | OFFSET | SIZE (BYTES) | FORMAT | DESCRIPTION |
|---|---|---|---|---|
| Msg Size | 0 | 2 | Binary | The size of the message: 40 Bytes |
| Msg Type | 2 | 2 | Binary | This field identifies the type of message. 108 – Attributed Add Order Refresh Message |
| SourceTime | 4 | 4 | Binary | This field specifies the time when the msg was generated in the order book. The number represents the number of seconds in UTC time |
| SourceTimeNS | 8 | 4 | Binary | This field represents the nanosecond offset from the time reference second in UTC time |
| SymbolIndex | 12 | 4 | Binary | This field identifies the numerical representation of the symbol. |
| SymbolSeqNum | 16 | 4 | Binary | This field contains the symbol sequence number |
| OrderID | 20 | 4 | Binary | The Order ID identifies a unique order. |
| Price | 24 | 4 | Binary | This field contains the price point.  Use the Price scale from the symbol-mapping index. |
| Volume | 28 | 4 | Binary | This field contains the order quantity in shares |
| Side | 32 | 1 | ASCII | This field indicates the side of the order Buy/sell. Valid values: ■ 'B' – Buy ■ 'S' – Sell |
| OrderIDGTCIndicator | 33 | 1 | Binary | This field specifies if Trade Order ID is a GTC order ■ '0' – Day Order ■ '1'- GTC Order |
| TradeSession | 34 | 1 | Bit Field | Values: ■ 0x01  Ok for morning hours ■ 0x02  Ok for national hours (core) ■ 0x03 OK for morning and core ■ 0x04  Ok for late hours ■ 0x06 OK for core and late ■ 0x07 OK for morning, core, and late |
| FirmID | 35 | 5 | Binary | This field provides market participant's firm ID |

# 9.    TRADE MESSAGE – MSG TYPE '220'

A Trade message is published as a result of an execution involving either visible or hidden liquidity.

Trade messages published by the NYSE Arca Integrated feed correspond to Trade messages published by Arca to the CTA.

| FIELD NAME | OFFSET | SIZE (BYTES) | FORMAT | DESCRIPTION |
|---|---|---|---|---|
| Msg Size | 0 | 2 | Binary | Size of the message: 54 Bytes |
| Msg Type | 2 | 2 | Binary | This field identifies the type of message.<br><br>220 –  Trade Message |
| SourceTime | 4 | 4 | Binary | This field specifies the time when the msg was generated in the order book. The number represents the number of seconds in UTC time (since EPOCH) |
| SourceTimeNS | 8 | 4 | Binary | This field specifies the number represents the nanosecond portion of UTC time (since EPOCH) |
| SymbolIndex | 12 | 4 | Binary | This field identifies the numerical representation of the symbol. |
| SymbolSeqNum | 16 | 4 | Binary | This field contains the symbol sequence number |
| TradeID | 20 | 4 | Binary | The TradeID identifies a unique transaction in the matching and allows you to correlate execution reports to the last sale. |
| Price | 24 | 4 | Binary | This field specifies the price of the order. Use the Price scale from the symbol mapping index. |
| Volume | 28 | 4 | Binary | Volume of the trade in actual shares |
| TradeCond1 | 32 | 1 | ASCII | This field contains a settlement related conditions. Valid values:<br><br>■  '@' - Regular Sale<br>■  'C' – Cash<br>■  'N'– Next Day Trade<br>■  'R' – Seller |
| TradeCond2 | 33 | 1 | ASCII | This field contains a the Reason for Trade Through Exemptions. Valid values: |

| FIELD NAME | OFFSET | SIZE (BYTES) | FORMAT | DESCRIPTION |
|---|---|---|---|---|
| | | | | ■ '0x20' – N/A<br>■ 'F' – Intermarket Sweep Order<br>■ 'O' – Market Center Opening Trade<br>■ '4' – Derivatively Priced<br>■ '5' – Market Center Reopening Trade<br>■ '6' – Market Center Closing Trade<br>■ '9' – Corrected Last Sale Price |
| TradeCond3 | 34 | 1 | ASCII | This field contains extended hours/sequencing related conditions. Valid values:<br><br>■ '0x20' – N/A<br>■ 'L' – Sold Last<br>■ 'T' – Extended Hours Trade<br>■ 'U' – Extended Hours Sold (Out of Sequence)<br>■ 'Z' – Sold |
| TradeCond4 | 35 | 1 | ASCII | This field contains the SRO Required Detail. Valid values:<br><br>■ '@' - Regular Sale<br>■ '0x20' – N/A<br>■ 'B' – Average Price Trade<br>■ 'E' – Automatic Execution<br>■ 'H' – Price Variation Trade<br>■ 'I' – Odd Lot Trade<br>■ 'M' – Official Closing Price<br>■ 'P' – Prior Indicative Match Price<br>■ 'Q' – Official Open Price<br>■ 'V' – Stock-Option Trade<br>■ 'X' – Cross Trade |
| Trade Through Exempt | 36 | 1 | ASCII | ■ 'X' – 611 Trade through Exempt<br>■ '0x20' – N/A |
| LiquidityIndicatorFlag | 37 | 1 | Binary | This field indicates which side added liquidity to the trade. Bit Shift values:<br><br>■ 0x01 Buy Side<br>■ 0x02 Sell Side<br>■ 0x04 No Liquidity added |
| Ask Price | 38 | 4 | Binary | This field specifies the Ask price of the last quote at the time of the trade. Use the Price scale from the symbol |

| FIELD NAME | OFFSET | SIZE (BYTES) | FORMAT | DESCRIPTION |
|---|---|---|---|---|
| | | | | mapping index. |
| Ask Volume | 42 | 4 | Binary | This field contains the Ask size of the last quote at the time of the trade |
| Bid Price | 46 | 4 | Binary | This field specifies the Bid price of the last quote at the time of the trade. Use the Price scale from the symbol mapping index. |
| Bid Volume | 50 | 4 | Binary | This field contains the Bid size of the last quote at the time of the trade |

## 10.   TRADE CANCEL OR BUST MESSAGE – MSG TYPE '221'

In the event that an earlier Trade has been reported in error, a Trade Cancel message is sent to delete the Trade.

| FIELD NAME | OFFSET | SIZE (BYTES) | FORMAT | DESCRIPTION |
|---|---|---|---|---|
| Msg Size | 0 | 2 | Binary | Size of the message: 24 Bytes |
| Msg Type | 2 | 2 | Binary | This field identifies the type of message.<br><br> 221 – Trade Cancel or Bust Message |
| SourceTime | 4 | 4 | Binary | This field specifies the time when the msg was generated in the order book. The number represents the number of seconds in UTC time (since EPOCH) |
| SourceTimeNS | 8 | 4 | Binary | This field specifies the number represents the nanosecond portion of UTC time (since EPOCH) |
| SymbolIndex | 12 | 4 | Binary | This field identifies the numerical representation of the symbol. |
| SymbolSeqNum | 16 | 4 | Binary | This field contains the symbol sequence number |
| OriginalTradeID | 20 | 4 | Binary | This field is the TradeID of the original trade marked as a correction by this message. |

## 11.   TRADE CORRECTION MESSAGE – MSG TYPE '222'

| FIELD NAME | OFFSET | SIZE (BYTES) | FORMAT | DESCRIPTION |
|---|---|---|---|---|
| Msg Size | 0 | 2 | Binary | Size of the message: 41 Bytes |
| Msg Type | 2 | 2 | Binary | This field identifies the type of message.<br><br>222 –  Trade Correction Message |
| SourceTime | 4 | 4 | Binary | This field specifies the time when the msg was generated in the order book. The number represents the number of seconds in UTC time (since EPOCH) |
| SourceTimeNS | 8 | 4 | Binary | This field specifies the number represents the nanosecond portion of UTC time (since EPOCH) |
| SymbolIndex | 12 | 4 | Binary | This field identifies the numerical representation of the symbol. |
| SymbolSeqNum | 16 | 4 | Binary | This field contains the symbol sequence number |
| OriginalTradeID | 20 | 4 | Binary | This field is the source sequence number of the original trade marked as a correction by this message. |
| TradeID | 24 | 4 | Binary | The LinkID identifies a unique transaction in the matching and allows you to correlate execution reports to the last sale. |
| Price | 28 | 4 | Binary | This field specifies the price of the order. Use the Price scale from the symbol mapping index. |
| Volume | 32 | 4 | Binary | Volume of the trade in actual shares |
| TradeCond1 | 36 | 1 | ASCII | This field contains a settlement related conditions. Valid values:<br><br>■  '@' - Regular Sale<br>■  'C' – Cash<br>■  'N'– Next Day Trade<br>■  'R' – Seller |
| TradeCond2 | 37 | 1 | ASCII | This field contains a the Reason for Trade Through Exemptions. Valid values:<br><br>■  '0x20' – N/A<br>■  'F' – Intermarket Sweep Order |

| FIELD NAME | OFFSET | SIZE (BYTES) | FORMAT | DESCRIPTION |
|---|---|---|---|---|
| | | | | ■ 'O' – Market Center Opening Trade<br>■ '4' – Derivatively Priced<br>■ '5' – Market Center Reopening Trade<br>■ '6' – Market Center Closing Trade |
| TradeCond3 | 38 | 1 | ASCII | This field contains extended hours/sequencing related conditions. Valid values:<br><br>■ '0x20' – N/A<br>■ 'L' – Sold Last<br>■ 'T' – Extended Hours Trade<br>■ 'U' – Extended Hours Sold (Out of Sequence)<br>■ 'Z' – Sold |
| TradeCond4 | 39 | 1 | ASCII | This field contains the SRO Required Detail. Valid values:<br><br>■ '@' - Regular Sale<br>■ '0x20' – N/A<br>■ 'B' – Average Price Trade<br>■ 'E' – Automatic Execution<br>■ 'H' – Price Variation Trade<br>■ 'I' – Odd Lot Trade<br>■ 'M' – Official Closing Price<br>■ 'P' – Prior Indicative Match Price<br>■ 'Q' – Official Open Price<br>■ 'V' – Stock-Option Trade<br>■ 'X' – Cross Trade |
| Trade Through Exempt | 40 | 1 | ASCII | 'X' – 611 Trade through Exempt<br>'0x20' – N/A |

## 12.  STOCK SUMMARY MESSAGE – MSG TYPE '223'

The stock summary message is sent on a separate channel from the main feed every one minute, regardless of whether the information has changed to or not.

| FIELD NAME | OFFSET | SIZE (BYTES) | FORMAT | DESCRIPTION |
|---|---|---|---|---|
| Msg Size | 0 | 2 | Binary | Size of the message: 36 bytes |
| Msg Type | 2 | 2 | Binary | This field identifies the type of message.<br><br>223 – Stock Summary Message |
| SourceTime | 4 | 4 | Binary | This field specifies the time when the msg was generated in the order book. The number represents the number of seconds in UTC time (since EPOCH) |
| SourceTimeNS | 8 | 4 | Binary | This field specifies the number represents the nanosecond portion of UTC time (since EPOCH) |
| SymbolIndex | 12 | 4 | Binary | This field identifies the numerical representation of the symbol. |
| HighPrice | 16 | 4 | Binary | This field specifies the exchange high price of the stock for the day. Use the Price scale from the symbol mapping index. |
| LowPrice | 20 | 4 | Binary | This field specifies the exchange Low price of the stock for the day. Use the Price scale from the symbol mapping index. |
| Open | 24 | 4 | Binary | This field specifies the exchange Opening price of the stock for the day.  Use the Price scale from the symbol mapping index. |
| Close | 28 | 4 | Binary | This field specifies the exchange Closing price of the stock for the day.  Use the Price scale from the symbol mapping index. |
| TotalVolume | 32 | 4 | Binary | This field specifies the exchange cumulative volume for the stock throughout the day. |

## 13.   IMBALANCE MESSAGE– MSG TYPE '105'

Imbalance messages are sent periodically to update price and volume information during auctions.

See Imbalance Calculation below for more information.

| FIELD NAME | OFFSET | SIZE (BYTES) | FORMAT | DESCRIPTION |
|---|---|---|---|---|
| Msg Size | 0 | 2 | Binary | The size of the message: 52 Bytes |
| Msg Type | 2 | 2 | Binary | The type of message. 105 – Imbalance Message |
| SourceTime | 4 | 4 | Binary | The time when this msg was generated in the order book, in seconds since Jan 1, 1970 00:00:00 UTC. |
| SourceTimeNS | 8 | 4 | Binary | The nanosecond offset from the Source Time |
| SymbolIndex | 12 | 4 | Binary | The ID of the symbol in the Symbol Index msg |
| SymbolSeqNum | 16 | 4 | Binary | The sequence number of this message in the set of all messages for this symbol |
| IndicativeMatchPrice | 20 | 4 | Binary | The best price at which the maximum volume of shares is executable in the applicable auction, subject to Auction Collars.  It includes the non-displayed quantity of Reserve Orders.  See Table 6 for further details. |
| PairedQty | 24 | 4 | Binary | The number of shares paired off at the Indicative Match Price |
| TotalImbalanceQty | 28 | 4 | Binary | The total imbalance quantity at the Indicative Match Price |
| MarketImbalanceQty | 32 | 4 | Binary | The total market order imbalance at the Indicative Match Price |
| AuctionTime | 36 | 2 | Binary | Projected Auction Time (hhmm) |
| AuctionType | 38 | 1 | ASCII | ■  'O' – Early Opening Auction<br>■  'M' – Core Opening Auction<br>■  'H' – Reopening Auction (Halt resume)<br>■  'C' – Closing Auction<br>■  'R' – Regulatory Imbalance |
| ImbalanceSide | 39 | 1 | ASCII | This field indicates the side of the imbalance Buy/sell. Valid Values:<br><br>■  'B' – Buy<br>■  'S' – Sell<br>■  Space – No imbalance |
| ContinuousBook ClearingPrice | 40 | 4 | Binary | Not supported, defaulted to 0. |

| FIELD NAME | OFFSET | SIZE (BYTES) | FORMAT | DESCRIPTION |
|---|---|---|---|---|
| ClosingOnly ClearingPrice | 44 | 4 | Binary | Not supported, defaulted to 0. |
| SSRFilingPrice | 48 | 4 | Binary | Not supported, defaulted to 0. |

## 13.1   IMBALANCE CALCULATION

NYSE Arca conducts three single-price auctions during the day: the Early Opening Auction, the Core Opening Auction and the Closing Auction.  As a part of the auction process, the indicative match price, matched volume, total imbalance, and market imbalance are disseminated every second if there is any change from the previous second.

**NYSE Arca Auction-Eligible Securities**

| AUCTION TYPES | ELIGIBLE SECURITIES |
|---|---|
| **Early Opening Auction** **Core Opening Auction** **Closing Auction** | ■   NYSE Arca-listed securities<br><br>■   UTP securities designated as eligible by the NYSE Group |
| **Trading Halt Auctions** | ■   NYSE Arca-listed securities |

**Table 6 Imbalance Calculation**

| AUCTION TYPE | DESCRIPTION |
|---|---|
| **Early Opening Auction** | **Interest Included**<br><br>1.   Limit Orders designated for the Early Trading Session.<br>2.   During the last minute before the Early Opening Auction time, the non-displayed quantity of Reserve Orders designated for the Early Open Auction is included in the Matched Volume and Total Imbalance Volume.<br><br>**Order Cancellation**<br><br>Orders can be cancelled at any time up to the conclusion of  the auction.<br><br>**Calculation**<br><br>■   The Early Opening Auction occurs at the Indicative Match Price.<br><br>■   If two or more prices can maximize executable volume, the Early Opening Auction occurs at whichever price is closest to the previous closing price in an effort to maintain continuity.<br><br>■   Unexecuted orders become eligible for the Opening Session immediately upon conclusion of the Early Opening Auction. |

| AUCTION TYPE | DESCRIPTION |
|---|---|
| **Core Opening Auction** | **Interest Included**<br><br>1. Limit, Market, MOO, LOO and Primary Peg orders<br>2. During the last 5 seconds before the Core Opening Auction time, the non-displayed quantity of Reserve Orders is included in the Matched Volume and Total Imbalance Volume.<br><br>**Order Cancellation**<br><br>Orders can be cancelled any time during the auction, except for MOO and LOO orders which can be cancelled only up to 1 minute before the conclusion of  the auction.<br><br>**Calculation**<br><br>■ The match price is the price that maximizes the volume that can be executed.<br><br>■ If two or more prices can maximize executable volume, the Core Opening Auction occurs at whichever price is closest to the previous closing price in an effort to maintain continuity. |
| **Closing Auction** | **Interest Included**<br><br>1. Limit, Market, MOC, LOC  and Primary Peg orders<br>2. During the last minute before the Closing Auction time, the non-displayed quantity of Reserve Orders is included in the Matched Volume and Total Imbalance Volume.<br><br>**Calculation**<br><br>■ Orders will be executed in the Closing Auction at the Indicative Match Price<br><br>**Further rules for NYSE Arca**<br><br>■ If there are multiple prices at which the total imbalance can equally execute, the indicative price will be based on the price closest to the Consolidated Tape last sale.<br><br>■ If the price closest to the Consolidated Tape last sale would trade through the NYSE Arca Book, the indicative match price will be the best price available where no trade through occurs. |

## 13.2   IMBALANCE PUBLICATION TIMES

Imbalance updates are published in real time during the following time periods

**Table 7 Imbalance Publication Times**

| AUCTION TYPE | NYSE ARCA |
|---|---|
| **Early Opening Auction** | 3:30 a.m. ET - 4:00 a.m. ET |
| **Core Opening Auction** | 8:00a.m. ET - 9:30 a.m. ET |
| **Closing Auction** | 3:00 p.m. ET - 4:00 p.m. ET |

## 13.3    MESSAGE SEQUENCE EXAMPLE

**Events with Add Order Messages:**

- A) 100 share Buy Order entered at $49.99 for stock ABC

- B) 400 share Sell Order entered at $30.00 for stock XYZ

- C) 100 share execution ABC at$49.99 for Stock ABC

- D) 200 share cancel at $30.00 for stock XYZ

- E) Time Reference Message Stock XYZ

Based on the example above, the following would be the following messages received

| EVENT | MSGSEQNUM | MSGTYPE | SYMBOLSEQNUM | SYMBOL | MESSAGE |
|---|---|---|---|---|---|
| A | 1 | 100 | 50 | ABC | Add Order |
| B | 2 | 100 | 32 | XYZ | Add Order |
| C | 4 | 103 | 52 | ABC | Execution |
| D | 5 | 220 | 53 | ABC | Trade |
| E | 6 | 101 | 54 | ABC | Delete |
| F | 7 | 102 | 33 | XYZ | Modify |
| G | 8 | 2 | 34 | XYZ | Time Reference |

## 14.   PRODUCT ID

Table 8 describes the Product ID associated with NYSE Arca Integrated Feed.

**Table 8 Product ID**

| EXCHANGE | PRODUCT ID | DESCRIPTION |
|----------|------------|-------------|
| **NYSE Arca** | 157 | NYSE Arca Integrated Feed |