

NASDAQ OMX PSX TotalView-ITCH 3.2

For PSX Trading Venue

NASDAQ OMX Global Data Products
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NASDAQ OMX PSX TotalView-ITCH 3.2

ITCH is the revolutionary NASDAQ OMX outbound protocol

1 Overview

1. Product Description

NASDAQ OMX PSX TotalView-ITCH ("PSX TotalView-ITCH") is a direct data feed product offered by NASDAQ OMX PSX.

PSX TotalView-ITCH 3.2 is compliant with the equity symbology initiative and will support issue symbols up to 8 characters in total length.

PSX TotalView-ITCH features the following data elements that support trading on the PSX exchange in all NASDAQ-, NYSE-, NYSE Amex-, NYSE Arca- and BATS-listed issues.

- **Order level data:** The PSX TotalView-ITCH data feed provides its full order depth using the standard ITCH format. ITCH uses a series of order messages to track the life of a customer order.¹ PSX TotalView-ITCH 3.2 carries order level data for securities traded via the NASDAQ OMX PSX system including NASDAQ-, NYSE-, NYSE Amex-, NYSE Arca- and BATS-listed issues.
- **Trade messages:** To ensure that customers have complete information about PSX market order flow, NASDAQ OMX PSX TotalView-ITCH supports a trade message to reflect a match of a non-displayable order in the PSX system.
- **Administrative messages**, such as trading actions and symbol directory messages:
 - Trading action messages are used to inform market participants when a security is halted or released for trading.
 - Symbol Directory messages provide basic security data such as the listing market.
- **Event controls**, such as start of day, end of day and emergency market halt/resume.

2 Architecture

The NASDAQ OMX PSX TotalView-ITCH 3.2 feed is made up of a series of sequenced messages. Each message is variable in length based on the message type and is composed of non-control ASCII bytes. The messages that make up the NASDAQ OMX PSX TotalView-ITCH 3.2 protocol are typically delivered using a higher level protocol that takes care of sequencing and delivery guarantees.

This data feed will be offered in three protocol options:

| Protocol Option | Number of Outbound Channels |
|----------------------------|--|
| SoupTCP3.0 | Single outbound channel for all securities |
| Compressed via SoupTCP | Single outbound channel for all securities |
| MoldUDP64 | Single outbound channel for all securities |

¹ NASDAQ OMX PSX TOTALVIEW-ITCH is an outbound market data feed only. The ITCH protocol does not support order entry. For information on NASDAQ OMX PSX order entry protocols, please refer to the Trading Services section of the NASDAQ OMX Trader website.

Please note that customers will be assigned addresses for the TCP/IP feeds upon ordering only.

3 Data Types

All numeric fields are composed of a string of ASCII coded digits, right justified and space filled on the left.

All alpha fields are left justified and padded on the right with spaces.

Prices are given in decimal format with 6 whole number places followed by 4 decimal digits. The whole number portion is padded on the left with spaces; the decimal portion is padded on the right with zeros. The decimal point is implied by position; it does not appear inside the price field.

4 Message Formats

The NASDAQ OMX PSX TotalView-ITCH feed is composed of a series of messages that describe orders added to, removed from and executed on NASDAQ OMX PSX. The PSX TotalView-ITCH 3.2 also supports system event and administrative message formats.

Note: For consistency, NASDAQ OMX has coded the PSX TotalView-ITCH 3.2 to use the same data formats as the NASDAQ TotalView-ITCH 3.2 data feed offering. Functionality that will not be supported for the PSX market upon initial market implementation has been grayed out.

4.1 Time Messages

For bandwidth efficiency reasons, NASDAQ OMX PSX will use separate time stamp messages for the NASDAQ OMX PSX TotalView-ITCH 3.2 product. The messages will be sequenced so that data feed recipients can apply the time stamps properly. The time stamp is broken into two separate messages: seconds and milliseconds. Please note that the timestamp for new seconds will always be immediately followed by a time stamp for new milliseconds.

4.1.1 Seconds Message

This message is sent every second for which at least one message is being generated.

| SECONDS MESSAGE | | | | |
|-----------------|--------|--------|---------|-----------------------------------|
| Name | Offset | Length | Value | Notes |
| Message Type | 0 | 1 | "T" | Seconds Message. |
| Second | 1 | 5 | Numeric | Number of seconds since midnight. |

4.1.2 Milliseconds Message

This message is sent every millisecond for which at least one message is being generated.

| MILLISECONDS MESSAGE | | | | |
|----------------------|--------|--------|---------|---|
| Name | Offset | Length | Value | Notes |
| Message Type | 0 | 1 | "M" | Milliseconds Message. |
| Millisecond | 1 | 3 | Numeric | Number of milliseconds since last second. |

4.2 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 | "S" | System Event Message. |
| Event Code | 1 | 1 | Alphanumeric | See System Event Codes below. |

NASDAQ OMX PSX supports the following event codes on a daily basis on the PSX TotalView-ITCH 3.2 feed

| SYSTEM EVENT CODES | |
|--------------------|--|
| Code | Explanation |
| "O" | <i>Start of Messages.</i> Outside of time stamp messages, the start of day message is the first message sent in any trading day. |
| "S" | <i>Start of System hours.</i> This message indicates that the system is open and ready to start accepting orders. |
| "Q" | <i>Start of Market hours.</i> This message is intended to indicate that Market Hours orders are available for execution. |
| "M" | <i>End of Market hours.</i> This message is intended to indicate that Market Hours orders are no longer available for execution. |
| "E" | <i>End of System hours.</i> This indicates that the system is now closed and will not accept any new orders today. It is still possible to receive Broken Trade messages and Order Delete messages after the End of Day. |
| "C" | <i>End of Messages.</i> This is always the last message sent in any trading day. |

In the event of an emergency market condition (EMC), NASDAQ OMX PSX will also support the following event codes on PSX TotalView-ITCH 3.2.

| SYSTEM EVENT CODES – AS NEEDED | |
|--------------------------------|--|
| Code | Explanation |
| "A" | <i>Emergency Market Condition – Halt:</i> This message is sent to inform NASDAQ OMX PSX market participants that the EMC is in effect. No trading is allowed during the EMC. |
| "R" | <i>Emergency Market Condition – Quote Only Period:</i> This message is sent to inform NASDAQ OMX PSX market participants that the EMC quotation only period is in effect. |
| "B" | <i>Emergency Market Condition – Resumption:</i> This message is sent to inform NASDAQ OMX PSX market participants that EMC is no longer in effect. |

4.3 Stock Related Messages

4.3.1 Stock Directory

At the start of each trading day, NASDAQ OMX PSX disseminates stock directory messages for all active symbols in the system.

Market data redistributors should process this message to populate the Financial Status Indicator (required display field) and the Market Category (recommended display field) for NASDAQ-listed issues and PSX-listed issues.

| STOCK DIRECTORY | | | | |
|----------------------------|--------|--------|--------------|---|
| Name | Offset | Length | Value | Notes |
| Message Type | 0 | 1 | "R" | Stock Directory Message |
| Stock | 1 | 8 | Alphabetic | Denotes the security symbol for the issue in the feed. |
| Market Category | 9 | 1 | Alphanumeric | Indicates listing market center or listing market tier for the issue "N" = New York Stock Exchange (NYSE) "A" = NYSE Amex "P" = NYSE Arca "Q" = NASDAQ Global Select Market SM "G" = NASDAQ Global Market SM "S" = NASDAQ Capital Market [®] "Z" = BATS BZX Exchange Space = Not available |
| Financial Status Indicator | 10 | 1 | Alphanumeric | For NASDAQ-listed issues, this field indicates when a firm is not in compliance with NASDAQ continued listing requirements. "D" = Deficient "E" = Delinquent "Q" = Bankrupt "S" = Suspended "G" = Deficient and Bankrupt "H" = Deficient and Delinquent "J" = Delinquent and Bankrupt "K" = Deficient, Delinquent and Bankrupt Space = Company is in compliance, if NASDAQ-listed issue For NYSE, NYSE Amex, NYSE Arca and BATS issues, this field will also be space-filled. Redistributors should refer to SIAC feeds for code if needed. |
| Round Lot Size | 11 | 6 | Numeric | Indicates the number of shares that represent a round lot for the issue |
| Round Lots Only | 17 | 1 | Alphabetic | Indicates if NASDAQ or PSX system limits order entry for issue "Y" = Only round lots are accepted in this stock "N" = Odd/mixed lots are allowed |

4.3.2 Stock Trading Action

NASDAQ OMX uses this administrative message to indicate the current trading status of a security to the trading community.

Prior to the start of system hours, NASDAQ OMX will send out a Trading Action spin. In the spin, NASDAQ OMX will send out a Stock Trading Action message with the "T" (Trading Resumption) for all NASDAQ- and other exchange-listed securities that are eligible for trading at the start of the PSX 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 in the PSX platform at the start of the system hours. Please note that securities may be halted in the PSX system for regulatory or operational reasons.

After the start of system hours, NASDAQ OMX will use the Trading Action message to relay changes in trading status for an individual security. Messages will be sent when a stock is:

- Halted
- Released for quotation
- Released for trading

| STOCK TRADING ACTION | | | | |
|----------------------|--------|--------|-------|--|
| Name | Offset | Length | Value | Notes |
| Message Type | 0 | 1 | "H" | Stock Trading Action Message. |
| Stock | 1 | 8 | Alpha | Stock symbol right padded with spaces. |
| Trading State | 9 | 1 | Alpha | Indicates the current trading state for the stock on the PSX market. Allowable values: "H" = Halted or paused on across all U.S. equity markets "Q" = Quotation only period for cross-market halt or pause "T" = Trading on PSX |
| Reserved | 10 | 1 | Alpha | Reserved. |
| Reason | 11 | 4 | Alpha | Trading Action reason. |

4.3.3 Reg SHO Short Sale Price Test Restricted Indicator

In November 2010, the Securities and Exchange Commission (SEC) will implement changes to Rule 201 of the Regulation SHO (Reg SHO). For details, please refer to [SEC Release Number 34-61595](#). In association with the Reg SHO rule change, NASDAQ will introduce the following Reg SHO Short Sale Price Test Restricted Indicator message format.

For NASDAQ-listed issues, NASDAQ will support a full pre-opening spin of Reg SHO Short Sale Price Test Restricted Indicator messages indicating the Rule 201 status for all active issues. NASDAQ will also send the Reg SHO Short Sale Price Test Restricted Indicator message in the event of an intraday status change.

For other exchange-listed issues, NASDAQ will relay the Reg SHO Short Sale Price Test Restricted Indicator message when it receives an update from the primary listing exchange.

NASDAQ will process orders based on the most Reg SHO Restriction status value.

| REG SHO RESTRICTION | | | | |
|---------------------|--------|--------|---------|---|
| Name | Offset | Length | Value | Notes |
| Timestamp | 0 | 8 | Numeric | Time at which the market participant position message was generated |

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| Message Type | 9 | 1 | "Y" | Reg SHO Short Sale Price Test Restricted Indicator |
| Stock | 10 | 8 | Alpha | Stock symbol right padded with spaces. |
| Reg SHO Action | 18 | 1 | Alpha | Denotes the Reg SHO Short Sale Price Test Restriction status for the issue at the time of the message dissemination. Allowable values are: "0" = No price test in place "1" = Reg SHO Short Sale Price Test Restriction in effect due to an intra-day price drop in security "2" = Reg SHO Short Sale Price Test Restriction remains in effect |

4.3.4 Market Participant Position

Note: This message will not be supported for NASDAQ OMX PSX for initial market launch.

At the start of each trading day, NASDAQ OMX PSX disseminates a spin of market participant position messages. The message provides the Primary Market Maker status, Market Maker mode and Market Participant state for each NASDAQ OMX PSX market participant firm registered in an issue. Market participant firms may use these fields to comply with certain marketplace rules.

Throughout the day, NASDAQ OMX PSX will send out this message only if NASDAQ OMX Operations changes the status of a market participant firm in an issue.

| MARKET PARTICIPANT POSITION | | | | |
|-----------------------------|--------|--------|--------------|--|
| Name | Offset | Length | Value | Notes |
| Message Type | 0 | 1 | "L" | Market Participant Position message |
| MPID | 1 | 4 | Alphabetic | Denotes the market participant identifier for which the position message is being generated |
| Stock | 5 | 8 | Alphanumeric | Denotes the security symbol for which the position is being generated |
| Primary Market Maker | 13 | 1 | Alphanumeric | Indicates if the market participant firm qualifies as a Primary Market Maker in accordance with NASDAQ OMX PSX marketplace rules "Y" = Primary market maker "N" = Non-primary market maker |
| Market Maker Mode | 14 | 1 | Alphanumeric | Indicates the quoting participant's registration status in relation to SEC Rules 101 and 104 of Regulation M "N" = Normal "P" = Passive "S" = Syndicate "R" = Pre-syndicate "L" = Penalty |
| Market Participant State | 15 | 1 | Alphanumeric | Indicates the market participant's current registration status in the issue "A" = Active "E" = Excused/Withdrawn |

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| | | | | "W" = Withdrawn "S" = Suspended "D" = Deleted |
|--|--|--|--|---|

4.4 Add Order Message

An Add Order Message indicates that a new order has been accepted by the system and was added to the displayable book. The message includes a day-unique Order Reference Number used to track the order. NASDAQ OMX PSX TotalView-ITCH will support two variations of the Add Order Message format.

NASDAQ OMX PSX will support two variations of the Add Order message format.

4.4.1 Add Order – No MPID Attribution

This message will be generated for unattributed orders in the NASDAQ OMX PSX system.

| ADD ORDER MESSAGE | | | | |
|------------------------|--------|--------|--------------|--|
| Name | Offset | Length | Value | Notes |
| Message Type | 0 | 1 | "A" | Add Order Message. |
| Order Reference Number | 1 | 12 | Numeric | The unique reference number assigned to the new order. The order reference number is increasing, but not necessarily sequential. |
| Buy/Sell Indicator | 13 | 1 | Alphabetic | The type of order being added. "B" = Buy order. "S" = Sell order. |
| Shares | 14 | 6 | Numeric | The total number of shares associated with the order being added to the book. |
| Stock | 20 | 8 | Alphanumeric | The security symbol for which the order is being added. |
| Price | 28 | 10 | Numeric | The display price of the new order. Refer to Data Types for field processing notes. |

4.4.2 Add Order – MPID Attribution

Note: This message will not be supported for NASDAQ OMX PSX for initial market launch.

This message will be generated for attributed orders and quotations entered into the NASDAQ OMX PSX system.

| ADD ORDER – MPID ATTRIBUTION MESSAGE | | | | |
|--------------------------------------|--------|--------|------------|--|
| Name | Offset | Length | Value | Notes |
| Message Type | 0 | 1 | "F" | Add Order Message. |
| Order Reference Number | 1 | 12 | Numeric | The unique reference number assigned to the new order. The order reference number is increasing, but not necessarily sequential. |
| Buy/Sell Indicator | 13 | 1 | Alphabetic | The type of order being added. "B" = Buy order. "S" = Sell order. |
| Shares | 14 | 6 | Numeric | The total number of shares associated with the order being added to the book. |

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|-------------|----|----|--------------|---|
| Stock | 20 | 8 | Alphanumeric | The security symbol for which the order is being added. |
| Price | 28 | 10 | Numeric | The display price of the new order. Refer to Data Types for field processing notes. |
| Attribution | 38 | 4 | Alphabetic | Market participant identifier associated with the entered order. |

4.5 *Modify Order Messages*

Modify Order Messages always include the Order Reference Number of the Add Order to which the update applies. To determine the current display shares for an order, NASDAQ OMX PSX TotalView-ITCH 3.2 subscribers must deduct the number of shares stated in the Modify Message from the original number of shares stated in the Add Order Message with the same reference number. NASDAQ OMX PSX may send multiple Modify Order Messages for the same order reference number and the effects are cumulative. When the number of display shares for an order reaches zero, the order is dead and should be removed from the book.

4.5.1 *Order Executed Message*

This message is sent whenever an order on the book is executed in whole or in part. It is possible to receive several Order Executed Messages for the same order if that order is executed in several parts. The multiple Order Executed Messages on the same order are cumulative.

By combining the executions received separately via two types of Order Executed Messages and Trade Messages, it is possible to build a complete view of all executions that happen on NASDAQ OMX PSX. Cross execution information is available in one bulk print via the Cross Trade Message.

| ORDER EXECUTED MESSAGE | | | | |
|------------------------|--------|--------|---------|--|
| Name | Offset | Length | Value | Notes |
| Message Type | 0 | 1 | "E" | Order Executed Message. |
| Order Reference Number | 1 | 12 | Numeric | The order reference number associated with the executed order. |
| Executed Shares | 13 | 6 | Numeric | The number of shares executed. |
| Match Number | 19 | 12 | Numeric | The PSX generated day-unique Match Number of this execution. The match number is also referenced in the Trade Break Message. |

4.5.2 Order Executed With Price Message

This message is sent whenever an order on the book is executed in whole or in part at a price different from the initial display price. Since the execution price is different than the display price of the original Add Order, the message includes a price field within this execution message.

It is possible to receive multiple Order Executed and Order Executed with Price messages for the same order if that order is executed in several parts. The multiple Order Executed messages on the same order are cumulative.

These executions may be marked as non-printable. If the execution is marked as non-printed, it means that the shares will be included into a later bulk print (e.g., in the case of cross executions). If a firm is looking to use the NASDAQ OMX PSX TotalView-ITCH 3.2 data in time-and-sales displays or volume calculations, it is recommended that firms ignore messages marked as non-printable to prevent double counting.

| ORDER EXECUTED WITH PRICE MESSAGE | | | | |
|-----------------------------------|--------|--------|------------|---|
| Name | Offset | Length | Value | Notes |
| Message Type | 0 | 1 | "C" | Order Executed Message. |
| Order Reference Number | 1 | 12 | Numeric | The reference number of the order that was executed. |
| Executed Shares | 13 | 6 | Numeric | The number of shares executed. |
| Match Number | 19 | 12 | Numeric | The NASDAQ OMX PSX generated day-unique Match Number of this execution. The match number is also referenced in the Trade Break Message. |
| Printable | 31 | 1 | Alphabetic | Indicates if the execution should be reflected on time and sale displays and volume calculations. "N" = Non-printable "Y" = Printable |
| Execution Price | 32 | 10 | Numeric | The price at which the order execution occurred. Refer to Data Types for field processing notes. |

4.5.3 Order Cancel Message

This message is sent whenever an order on the book is modified as a result of a partial cancellation.

| ORDER CANCEL MESSAGE | | | | |
|------------------------|--------|--------|---------|--|
| Name | Offset | Length | Value | Notes |
| Message Type | 0 | 1 | "X" | Order Cancel Message. |
| Order Reference Number | 1 | 12 | Numeric | The reference number of the order being canceled or reduced. |
| Canceled Shares | 13 | 6 | Numeric | The number of shares to be removed from the display size of the order as the result of a cancellation. |

4.5.4 *Order Delete Message*

This message is sent whenever an order on the book is being cancelled. All remaining shares are no longer accessible so the order should be removed from the book.

| ORDER DELETE MESSAGE | | | | |
|------------------------|--------|--------|---------|--|
| Name | Offset | Length | Value | Notes |
| Message Type | 0 | 1 | "D" | Order Delete Message. |
| Order Reference Number | 1 | 12 | Numeric | The reference number of the order being canceled or reduced. References a previously sent Add Order Message. |

4.5.5 *Order Replace Message*

This message is sent whenever an order on the book has been cancelled and replaced. All remaining shares from the original order are no longer accessible, and must be removed. The new order details are provided for the replacement, along with a new order reference number which will be used henceforth. The side, stock, and attribution (if any) remain the same as the original order, so they are not given in this message.

| ORDER REPLACE MESSAGE | | | | |
|---------------------------------|--------|--------|---------|--|
| Name | Offset | Length | Value | Notes |
| Message Type | 0 | 1 | "U" | Order Replace Message. |
| Original Order Reference Number | 1 | 12 | Numeric | The original reference number of the order being replaced. |
| New Order Reference Number | 13 | 12 | Numeric | The new reference number for this order. Note that new reference numbers mean new time priority, so this order belongs below other orders at the same price in priority. |
| Shares | 25 | 6 | Numeric | The new total displayed quantity. |
| Price | 31 | 10 | Numeric | The new display price for the order. Refer to Data Types for field processing notes. |

4.6 *Trade Messages*

4.6.1 *Trade Message (Non-Cross)*

The Trade Message is designed to provide execution details for normal match events involving non-displayable order types. (Note: There is a separate message for cross events.)

Since no Add Order Message is generated when a non-displayed order is initially received, the system cannot use the Order Executed message for all matches. Therefore this message was developed to indicate when a match occurs between non-displayable order types. A Trade Message is transmitted each time a non-displayable order is executed in whole or in part. It is possible to receive multiple Trade Messages for the same order if that order is executed in several parts. Trade Messages for the same order are cumulative.

Trade Messages should be included in NASDAQ OMX PSX time-and-sales displays as well as volume and other market statistics. Since Trade Messages do not affect the book, however, they may be ignored by firms just looking to build and track the NASDAQ OMX PSX display.

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| TRADE MESSAGE (NON-CROSS) | | | | |
|---------------------------|--------|--------|--------------|--|
| Name | Offset | Length | Value | Notes |
| Message Type | 0 | 1 | "P" | Trade Message Identifier |
| Order Reference Number | 1 | 12 | Numeric | The unique reference number assigned to the order on the book being executed. Effective December 6, 2010, NASDAQ OMX will populate the Order Reference Number field within the Trade (Non-Cross) message as zero. For the ASCII versions of the TotalView-ITCH data feeds, the field will be space-padded zero. |
| Buy/Sell Indicator | 13 | 1 | Alphabetic | The type of non-display order on the book being matched. "B" =Buy order "S" =Sell order Effective 07/14/2014, this field will always be "B" regardless of the resting side |
| Shares | 14 | 6 | Numeric | The number of shares being matched in this execution. |
| Stock | 20 | 8 | Alphanumeric | The security symbol associated with the match execution. |
| Price | 28 | 10 | Numeric | The match price of the order. Refer to Data Types for field processing notes. |
| Match Number | 38 | 12 | Numeric | The PSX generated session-unique Match Number for this trade. The Match Number is referenced in the Trade Break Message. |

4.6.2 Cross Trade Message

Note: This message will not be supported for NASDAQ OMX PSX for initial market launch.

The Cross Trade message indicates that PSX has completed its cross process for cross-eligible securities. PSX sends out a Cross Trade message for all active cross-eligible issues in the system following the Opening, Closing and EMC cross events. Firms may use the Cross Trade message to determine when the cross for a security has been completed. (Note: For the halted securities, firms should use the Trading Action message to determine when an issue has been released for trading.)

For most securities, the Cross Trade message will indicate the bulk volume associated with the cross event. If the order interest is insufficient to conduct a cross in a particular issue, however, the Cross Trade message may show the shares as zero.

To avoid double counting of cross volume, firms should not include transactions marked as non-printable in time-and-sales displays or market statistic calculations.

| CROSS TRADE MESSAGE | | | | |
|---------------------|--------|--------|--------------|--|
| Name | Offset | Length | Value | Notes |
| Message Type | 0 | 1 | "Q" | Cross Trade Message |
| Shares | 1 | 9 | Numeric | The number of shares matched in the PSX Cross. |
| Stock | 10 | 8 | Alphanumeric | The PSX-listed security symbol associated with |

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|--------------|----|----|------------|---|
| | | | | the cross trade message. |
| Cross Price | 18 | 10 | Numeric | The price at which the cross occurred. Refer to Data Types for field processing notes. |
| Match Number | 28 | 9 | Numeric | The NASDAQ OMX PSX generated day-unique Match Number of this execution. |
| Cross Type | 37 | 1 | Alphabetic | The PSX cross session for which the message is being generated. "O" = PSX Opening Cross. "C" = PSX Closing Cross. "H" = PSX Cross for IPO and halted securities. "I" = PSX Cross Network: Intraday Cross and Post-Close Cross |

4.6.3 *Broken Trade / Order Execution Message*

The Broken Trade Message is sent whenever an execution on NASDAQ OMX PSX is broken. An execution may be broken if it is found to be "clearly erroneous" pursuant to agreed upon Clearly Erroneous Policy. A trade break is final; once a trade is broken, it cannot be reinstated.

Firms that use the PSX TotalView-ITCH 3.2 feed to create time-and-sales displays or calculate market statistics should be prepared to process the broken trade message. If a firm is only using the PSX TotalView-ITCH feed to build a book, however, it may ignore these messages as they have no impact on the current book.

| BROKEN TRADE MESSAGE | | | | |
|----------------------|--------|--------|---------|--|
| Name | Offset | Length | Value | Notes |
| Message Type | 0 | 1 | "B" | Broken Trade Message. |
| Match Number | 1 | 12 | Numeric | The NASDAQ OMX PSX Match Number of the execution that was broken. This refers to a Match Number from a previously transmitted Order Executed Message, Order Executed With Price Message, or Trade Message. |

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4.7 Net Order Imbalance Indicator (NOII) Message

Note: This message will not be supported for NASDAQ OMX PSX for initial market launch.

NASDAQ OMX PSX disseminates NOII data at 5-second intervals in the minutes leading up to the PSX Opening Cross and PSX Closing Cross.

| NOII MESSAGE | | | | |
|---------------------------|--------|--------|--------------|--|
| Name | Offset | Length | Value | Notes |
| Message Type | 0 | 1 | "I" | NOII Message |
| Paired Shares | 1 | 9 | Numeric | The total number of shares that are eligible to be matched at the Current Reference Price. |
| Imbalance Shares | 10 | 9 | Numeric | The number of shares not paired at the Current Reference Price. |
| Imbalance Direction | 19 | 1 | Alphabetic | The market side of the order imbalance. "B" = Buy imbalance "S" = Sell imbalance "N" = No imbalance "O" = Insufficient orders to calculate |
| Stock | 20 | 8 | Alphanumeric | The PSX assigned security symbol associated with the NOII message. |
| Far Price | 28 | 10 | Numeric | A hypothetical auction-clearing price for cross orders only. |
| Near Price | 38 | 10 | Numeric | A hypothetical auction-clearing price for cross orders as well as continuous orders. |
| Current Reference Price | 48 | 10 | Numeric | The price at which the NOII shares are being calculated. |
| Cross Type | 58 | 1 | Alphabetic | The PSX cross session for which the message is being generated. "O" = PSX Opening Cross. "C" = PSX Closing Cross. "H" = Cross for IPO and halted securities. |
| Price Variation Indicator | 59 | 1 | Alphanumeric | This field indicates the absolute value of the percentage of deviation of the Near Indicative Clearing Price to the nearest Current Reference Price. "L" = Less than 1% "1" = 1 to 1.99% "2" = 2 to 2.99% "3" = 3 to 3.99% "4" = 4 to 4.99% "5" = 5 to 5.99% "6" = 6 to 6.99% "7" = 7 to 7.99% "8" = 8 to 8.99% "9" = 9 to 9.99% "A" = 10 to 19.99% "B" = 20 to 29.99% "C" = 30% or greater Space = Cannot be calculated |

5 Support

- For general product support for NASDAQ OMX PSX data feeds, please contact NASDAQ OMX Global Data Products at +1 301 978 5307 or dataproductions@nasdaqomx.com.
- For technical support for NASDAQ OMX PSX data feeds, please contact NASDAQ OMX Global Software Development at devsupport@nasdaqomx.com.

Appendix A

Documentation Revision Control Log

June 12, 2014: PSX TotalView-ITCH Version 3.2

Released a new version of TotalView-ITCH documentation to support the following change:

- Per [Data Technical News #2014-17](#), Revised the Buy/Sell Indicator value in the Trade Message (Non-Cross) to "Always 'B' regardless of resting side"

November 1, 2013: PSX TotalView-ITCH Version 3.2

NASDAQ OMX released a new version of the TotalView-ITCH documentation to support details of expanded symbology (Appendix B).

March 11, 2013: PSX TotalView-ITCH Version 3.2

NASDAQ OMX added the following Trading Action Reason Code for LULD to reflect when the National Best Bid is below the lower price band and/or the National Best Offer is above than the upper price band and the NMS Stock is not in a Limit State.

- LUDS - Volatility Trading Pause – Straddle Condition

January 9, 2013: PSX TotalView-ITCH Version 3.2

NASDAQ OMX added the following Trading Action Reason Code:

- MWC0 - Market Wide Circuit Breaker Halt – Carry over from previous day

January 8, 2013: PSX TotalView-ITCH Version 3.2

NASDAQ OMX removed the Trading Action State, "P", from the Stock Trading Message.

November 6, 2012: PSX TotalView-ITCH Version 3.2

Released a new version of the TotalView-ITCH documentation to support the following changes:

- Added the "P" value to the Trading State in the Stock Trading Message.
- Modified the values for the Trading Action Reason Codes. Added the following codes:
 - LUDP - Volatility Trading Pause
 - MWC1 - Market Wide Circuit Breaker Halt – Level 1
 - MWC2 - Market Wide Circuit Breaker Halt – Level 2
 - MWC3 - Market Wide Circuit Breaker Halt – Level 3
 - MWCQ - Market Wide Circuit Breaker Resumption
- Removed the Trading Action State, "V", related to the Volatility Guard Program.

November 1, 2011: PSX TotalView-ITCH 3.2

NASDAQ OMX updated the Market Category message to include the code "Z" for BATS-listed securities.

October 6, 2010: PSX TotalView-ITCH Version 3.2

NASDAQ OMX added a note to Trade (Non-Cross) message format stating that the Order Reference Number would be zero for all transactions as of December 6, 2010.

July 14, 2010: PSX TotalView-ITCH 3.2

NASDAQ OMX added a new Regulation SHO Short Sale Price Test Restricted Indicator message format to be introduced in the fourth quarter of 2010.

July 2, 2010 : PSX TotalView-ITCH 3.2

NASDAQ OMX added new Action Trading code(s) to the Stock Trading Action message for the NASDAQ Volatility Guard trading pause.

February 26, 2010 : PSX TotalView-ITCH 3.2

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Initial release of PSX documentation.

March 26, 2010 :

Inclusion of EMC (Emergency Market Conditions) System Event Codes

May 25, 2010 :

Inclusion of two new Trading Action Reason code values (T5 and T7) for single security trading pause situations

Appendix B

Stock Symbol Convention

For NASDAQ-listed issues, NASDAQ OMX currently restricts its symbol length to a maximum of 8 characters. For common stock issuances, NASDAQ, PSX and BX will only assign root symbols of 1 to 4 characters in length with possible fifth and or sixth character denoting a suffix. In certain instances, a dot "." delimiter may be applied to symbols after the root and between the suffix eg., XXXX.A. For subordinate securities, NASDAQ and BX will assign a 5 character symbol for which the last character relays information about the issue class or issue type. For the current list of fifth and or six character symbol suffixes, please refer to [Ticker Symbol Convention](#) page on the NASDAQ OMX Trader website.

For NYSE-, NYSE MKT- and NYSE Arca-listed securities with subordinate issue types, please refer to [Ticker Symbol Convention](#) page on the NASDAQ OMX Trader website.

Appendix C

Trading Action – Reason Codes

For NASDAQ-listed issues, NASDAQ OMX acts as the primary market and has the authority to institute a trading halt or trading pause in an issue due to news dissemination or regulatory reasons.

For CQS issues, NASDAQ, BX and PSX abide by any regulatory trading halts and trading pauses instituted by the primary or listing market as appropriate.

For all issue types, NASDAQ, BX and/or PSX may also halt trading for operational reasons.

NASDAQ, BX and/or PSX will send out a trading action message to inform its market participants when the trading status of an issue changes. For informational purposes, NASDAQ and PSX also attempt to provide the reason for each trading action update. For bandwidth efficiency reasons, NASDAQ, BX and PSX use a 4-byte code for the reason on its outbound data feeds.

| REASON CODES FOR TRADING HALT ACTIONS | |
|---------------------------------------|---|
| Code | Value |
| T1 | Halt News Pending |
| T2 | Halt News Disseminated |
| T5 | Single Security Trading Pause In Affect |
| T6 | Regulatory Halt — Extraordinary Market Activity |
| T8 | Halt ETF |
| T12 | Trading Halted; For Information Requested by Listing Market |
| H4 | Halt Non-Compliance |
| H9 | Halt Filings Not Current |
| H10 | Halt SEC Trading Suspension |
| H11 | Halt Regulatory Concern |
| LU DP | Volatility Trading Pause |
| LU DS | Volatility Trading Pause – Straddle Condition |
| MWC1 | Market Wide Circuit Breaker Halt – Level 1 |
| MWC2 | Market Wide Circuit Breaker Halt – Level 2 |
| MWC3 | Market Wide Circuit Breaker Halt – Level 3 |
| MWC0 | Market Wide Circuit Breaker Halt – Carry over from previous day |
| O1 | Operations Halt; Contact Market Operations |
| IPO1 | IPO Issue Not Yet Trading |
| M1 | Corporate Action |
| M2 | Quotation Not Available |
| Space | Reason Not Available |

| REASON CODES FOR QUOTATION/TRADING RESUMPTION ACTIONS | |
|---|--|
| Code | Value |
| T3 | News and Resumption Times |
| T7 | Single Security Trading pause / Quotation Only Period |
| R4 | Qualifications Issues Reviewed/Resolved; Quotations/Trading to Resume |
| R9 | Filing Requirements Satisfied/Resolved; Quotations/Trading To Resume |
| C3 | Issuer News Not Forthcoming; Quotations/Trading To Resume |
| C4 | Qualifications Halt ended; Maintenance Requirements Met; Resume |
| C9 | Qualifications Halt Concluded; Filings Met; Quotes/Trades To Resume |
| C11 | Trade Halt Concluded By Other Regulatory Auth.; Quotes/Trades Resume |
| MWCQ | Market Wide Circuit Breaker Resumption |
| R1 | New Issue Available |
| R2 | Issue Available |
| IPOQ | IPO Security Released for Quotation (NASDAQ OMX Securities Only) |
| IPOE | IPO Security — Positioning Window Extension (NASDAQ OMX Securities Only) |
| Space | Reason Not Available |

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