

Nasdaq BX TotalView-ITCH 5.0

ITCH is the revolutionary
Nasdaq outbound protocol



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1 Overview

Nasdaq BX TotalView-ITCHSM is a direct data feed product offered by Nasdaq BX.

Nasdaq BX TotalView-ITCH features the following data elements (in binary number format) for all exchange-listed equities securities traded via the Nasdaq BX execution system:

- **Order level data with attribution:** For Nasdaq BX execution system, Nasdaq BX will provide its full order depth using the standard ITCH format. BX TotalView-ITCH uses a series of messages of order messages to track the life of a customer order.¹ As an added feature, the BX TotalView-ITCH message formats will support Nasdaq BX market participant attribution. BX TotalView-ITCH carries order level data for NYSE-, NYSE MKT-, NYSE Arca- and BATS-listed securities, as well as, for Nasdaq BX-listed securities.
- **Trade messages:** To ensure that customers have complete information about Nasdaq BX order flow, BX TotalView-ITCH supports a trade message to reflect a match of a non-displayable order in the Nasdaq BX system. BX TotalView-ITCH also supports a separate trade message to reflect Nasdaq BX cross transactions.
- **Administrative messages**, such trading actions and symbol directory messages:
 - Trading action messages are used to inform market participants when a security is halted/paused or released for trading.
 - Symbol Directory messages provide basic security data such as the market tier and Financial Status Indicator.
 - Market participant position message carries the Primary Market Maker status, Market Participant status and Market Maker mode fields used by some firms to comply with market regulations.
- **Event controls**, such as start of day, end of day and emergency market halt/resume.

2 Architecture

The BX TotalView-ITCH feed is made up of a series of sequenced messages. Each message is variable in length based on the message type. The messages that make up the BX TotalView-ITCH protocol are typically delivered using a higher level protocol that takes care of sequencing and delivery guarantees.

Nasdaq BX offers the BX TotalView-ITCH data feed in three protocol options:

- [SoupBinTCP](#)
- [Compressed](#) via SoupBinTCP
- [MoldUDP64](#)

In the market data messages, instruments are identified by a stock locate code – a low lying integer employed with the intent of serving as an array index for rapidly looking up instrument details. The locate codes are dynamically assigned each day, starting with a value of 1, and communicated via the Stock Directory message. An instrument's locate code will not change intraday; however, there should be no expectation that the assignment will be the same

¹ Nasdaq BX TotalView-ITCH is an outbound market data feed only. The ITCH protocol does not support order entry. For information on Nasdaq BX order entry protocols, please refer to the [Trading Products section](#) of the NasdaqTrader website.

across multiple days. The Stock Locate code appears all messages, and at the same position in all messages to support efficient filtering. A default value of 0 will be applied to messages which are not stock dependent.

3 Data Types

All integer fields are big-endian (network byte order) binary encoded numbers. Unless otherwise noted, they are unsigned.

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

Prices are integer fields, supplied with an associated precision. When converted to a decimal format, prices are in fixed point format, where the precision defines the number of decimal places. For example, a field flagged as Price (4) has an implied 4 decimal places. The maximum value of price (4) in BX TotalView-ITCH is 200,000.0000 (decimal, 77359400 hex).

Timestamps are represented as nanoseconds since midnight

4 Message Formats

The BX TotalView-ITCH feed is composed of a series of messages that describe orders added to, removed from, and executed on Nasdaq BX as well as disseminate Cross and Stock Directory information.

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	"S"	System Event Message
Stock Locate	1	2	Integer	Always 0
Tracking Number	3	2	Integer	Nasdaq BX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight
Event Code	11	1	Alpha	See System Event Codes below

Nasdaq BX supports the following event codes on a daily basis on the BX TotalView---ITCH data feed.

System Event Codes – Daily	
Code	Explanation
“O”	Start of Messages. Outside of time stamp messages, the start of day message is the first message sent in any trading day
“S”	Start of System hours. This message indicates that Nasdaq BX is open and ready to start accepting orders
“Q”	Start of Market hours. This message is intended to indicate that Market Hours orders are available for execution
“M”	End of Market hours. This message is intended to indicate that Market Hours orders are no longer available for execution
“E”	End of System hours. It indicates that Nasdaq BX 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”	End of Messages. This is always the last message sent in any trading day.

4.2 Stock Related Messages

4.2.1 Stock Directory

At the start of each trading day, Nasdaq BX disseminates stock directory messages for all active symbols in the Nasdaq BX execution 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.

Stock Directory																												
Name	Offset	Length	Type	Value/Description																								
Message Type	0	1	“R”	Stock Directory Message																								
Stock Locate	1	2	Integer	Locate Code uniquely assigned to the security symbol for the day.																								
Tracking Number	3	2	Integer	Nasdaq BX internal tracking number																								
Timestamp	5	6	Integer	Time at which the directory message was generated. Refer to Data Types for field processing notes.																								
Stock	11	8	Alpha	Denotes the security symbol for the issue in the Nasdaq BX execution system.																								
Market Category	19	1	Alpha	Indicates Listing market or listing market tier for the issue																								
<table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td colspan="2">Nasdaq-Listed Instruments</td> </tr> <tr> <td>Q</td> <td>Nasdaq Global Select MarketSM</td> </tr> <tr> <td>G</td> <td>Nasdaq Global MarketSM</td> </tr> <tr> <td>S</td> <td>Nasdaq Capital Market®</td> </tr> <tr> <td colspan="2">Non-Nasdaq BX-Listed Instruments</td> </tr> <tr> <td>N</td> <td>New York Stock Exchange (NYSE)</td> </tr> <tr> <td>A</td> <td>NYSE MKT</td> </tr> <tr> <td>P</td> <td>NYSE Arca</td> </tr> <tr> <td>Z</td> <td>BATS ZExchange</td> </tr> <tr> <td>V</td> <td>Investors’ Exchange, LLC</td> </tr> <tr> <td><space></td> <td>Not available</td> </tr> </tbody> </table>					Code	Definition	Nasdaq-Listed Instruments		Q	Nasdaq Global Select Market SM	G	Nasdaq Global Market SM	S	Nasdaq Capital Market®	Non-Nasdaq BX-Listed Instruments		N	New York Stock Exchange (NYSE)	A	NYSE MKT	P	NYSE Arca	Z	BATS ZExchange	V	Investors’ Exchange, LLC	<space>	Not available
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A	NYSE MKT																											
P	NYSE Arca																											
Z	BATS ZExchange																											
V	Investors’ Exchange, LLC																											
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Financial Status Indicator	20	1	Alpha	For Nasdaq-listed issues, this field indicates when a firm is not in compliance with Nasdaq continued listing requirements																												
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Round Lot Size	21	4	Integer	Denotes the number of shares that represent a round lot for the issue																												
Round Lots Only	25	1	Alpha	Indicates if Nasdaq system limits order entry for issue																												
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Issue Classification	26	1	Alpha	Identifies the security class for the issue as assigned by Nasdaq. See Appendix for allowable values.																												
Issue Sub-Type	27	2	Alpha	Identifies the security sub-type for the issue as assigned by Nasdaq. See Appendix for allowable values.																												
Authenticity	29	1	Alpha	Denotes if an issue or quoting participant record is set-up in Nasdaq systems in a live/production, test, or demo state. Please note that firms should only show live issues and quoting participants on public quotation displays.																												
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T	Test																															

Short Sale Threshold Indicator	30	1	Alpha	Indicates if a security is subject to mandatory close-out of short sales under SEC Rule 203(b)(3).	
				Code	Definition
				Y	Issue is restricted under SEC Rule 203(b)(3)
				N	Issue is not restricted
<space>	Threshold Indicator not available				
IPO Flag	31	1	Alpha	Indicates if the Nasdaq security is set up for IPO release. This field is intended to help Nasdaq market participant firms comply with FINRA Rule 5131(b).	
				Code	Definition
				Nasdaq-Listed Instruments	
				Y	Nasdaq system only accepts round lots orders for this security.
N	Nasdaq system does not have any order size restrictions for this security. Odd and mixed lot orders are allowed.				
Non-Nasdaq-Listed Instruments					
<space>	Not available				
LULD Reference Price Tier	32	1	Alpha	Indicates which Limit Up / Limit Down price band calculation parameter is to be used for the instrument. Refer to LULD Rule for details.	
				Code	Definition
				1	Tier 1 NMS Stocks and select ETPs
				2	Tier 2 NMS Stocks
<space>	Not available				
ETP Flag	33	1	Alpha	Indicates whether the security is an exchange traded product (ETP):	
				Code	Definition
				Y	Instrument is an ETP
				N	Instrument is not an ETP
<space>	Not available				
ETP Leverage Factor	34	4	Integer	Tracks the integral relationship of the ETP to the underlying index. Example: If the underlying Index increases by a value of 1 and the ETP's Leverage factor is 3, indicates the ETF will increase/decrease (see Inverse) by 3. Note: Leverage Factor of 1 indicates the ETP is NOT leveraged. This field is used for LULD Tier I price band calculation purposes.	

Inverse Indicator	38	1	Alpha	Indicates the directional relationship between the ETP and underlying index
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Code	Definition
Y	ETP is an Inverse ETP
N	ETP is not an Inverse ETP

Example: An ETP Leverage Factor of 3 and an Inverse value of 'Y' indicates the ETP will decrease by a value of 3.

4.2.2 Stock Trading Action

Nasdaq BX 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 BX will send out a Trading Action spin. In the spin, Nasdaq BX 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 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 Nasdaq BX platform at the start of the system hours. Please note that securities may be halted in the Nasdaq BX system for regulatory or operational reasons.

After the start of system hours, Nasdaq BX 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
- Paused*
- Released for quotation
- Released for trading

* The paused status will be disseminated for Nasdaq-listed securities only. Trading pauses on non-Nasdaq listed securities will be treated simply as a halt.

Stock Trading Action

Name	Offset	Length	Value	Notes
Message Type	0	1	"H"	Stock Trading Action Message.
Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	Nasdaq BX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight
Stock	11	8	Alpha	Stock symbol, right padded with spaces
Trading State	19	1	Alpha	Indicates the current trading state for the stock. Allowable values: "H" = Halted across all U.S. equity markets / SROs "P" = Paused across all U.S. equity markets / SROs (Nasdaq-listed securities only) "Q" = Quotation only period for cross-SRO halt or pause "T" = Trading on Nasdaq BX
Reserved	20	1	Alpha	Reserved

Reason	21	4	Alpha	Trading Action reason
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4.2.3 Reg SHO Short Sale Price Test Restricted Indicator

In February 2011, the Securities and Exchange Commission (SEC) implemented 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 BX will introduce the following Reg SHO Short Sale Price Test Restricted Indicator message format.

For Nasdaq-listed issues, Nasdaq BX supports 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 BX also sends the Reg SHO Short Sale Price Test Restricted Indicator message in the event of an intraday status change.

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

Nasdaq BX processes orders based on the most Reg SHO Restriction status value.

Reg SHO Restriction				
Name	Offset	Length	Value	Notes
Message Type	0	1	"Y"	Reg SHO Short Sale Price Test Restricted Indicator
Locate Code	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	Nasdaq BX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight
Stock	11	8	Alpha	Stock symbol, right padded with spaces
Reg SHO Action	19	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

4.2.4. Market Participant Position

At the start of each trading day, Nasdaq BX 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 BX market participant firm registered in an issue. Market participant firms may use these fields to comply with certain marketplace rules.

Throughout the day, Nasdaq BX will send out this message only if Nasdaq 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

Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	Nasdaq BX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight
MPID	11	4	Alpha	Denotes the market participant identifier for which the position message is being generated
Stock	15	8	Alpha	Stock symbol, right padded with spaces
Primary Market Maker	23	1	Alpha	Indicates if the market participant firm qualifies as a Primary Market Maker in accordance with Nasdaq marketplace rules "Y" = primary market maker "N" = non-primary market maker
Market Maker Mode	24	1	Alpha	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	25	1	Alpha	Indicates the market participant's current registration status in the issue "A" = Active "E" = Excused/Withdrawn "W" = Withdrawn "S" = Suspended "D" = Deleted

4.2.5. Market-Wide Circuit Breaker (MWCB) Messaging

4.2.5.1 MWCB Decline Level Message

Informs data recipients what the daily MWCB breach points are set to for the current trading day.

MWCB Decline Level Message

Name	Offset	Length	Value	Notes
Message Type	0	1	"V"	Market wide circuit breaker Decline Level Message.
Stock Locate	1	2	Integer	Always set to 0
Tracking Number	3	2	Integer	Nasdaq BX internal tracking number
Timestamp	5	6	Integer	Time at which the MWCB Decline Level message was generated
Level 1	11	8	Price (8)	Denotes the MWCB Level 1 Value.
Level 2	19	8	Price (8)	Denotes the MWCB Level 2 Value.
Level 3	27	8	Price (8)	Denotes the MWCB Level 3 Value.

4.2.5.2 MWCB Status Message

Informs data recipients when a MWCB has breached one of the established levels

MWCB Decline Level Message				
Name	Offset	Length	Value	Notes
Message Type	0	1	"W"	Market-Wide Circuit Breaker Status message
Stock Locate	1	2	Integer	Always set to 0
Tracking Number	3	2	Integer	Nasdaq BX internal tracking number
Timestamp	5	6	Integer	Time at which the MWCB Breaker Status message was generated
Breached Level	11	1	Alpha	Denotes the MWCB Level that was breached. "1" = Level 1 "2" = Level 2 "3" = Level 3

4.2.6 Limit Up – Limit Down (LULD) Auction Collar

Indicates the auction collar thresholds within which a paused security can reopen following a LULD Trading Pause

LULD Auction Collar

Name	Offset	Length	Value	Notes
Message Type	0	1	"J"	LULD Auction Collar
Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	Nasdaq BX internal tracking number
Timestamp	5	6	Integer	Nanoseconds past midnight
Stock	11	8	Alpha	Stock symbol, right padded with spaces
Auction Collar Reference Price	19	4	Price (4)	Reference price used to set the Auction Collars
Upper Auction Collar Price	23	4	Price (4)	Indicates the price of the Upper Auction Collar Threshold
Lower Auction Collar Price	27	4	Price (4)	Indicates the price of the Lower Auction Collar Threshold
Auction Collar Extension	31	4	Integer	Indicates the number of the extensions to the Reopening Auction

4.2.7. Operational Halt

The Exchange uses this message to indicate the current Operational Status of a security to the trading community. An Operational Halt means that there has been an interruption of service on the identified security impacting only the designated Market Center. These Halts differ from the "Stock Trading Action" message types since an Operational Halt is specific to the exchange for which it is declared, and does not interrupt the ability of the trading community to trade the identified instrument on any other market place.

Nasdaq uses this administrative message to indicate the current trading status of the three market centers operated by Nasdaq.

Operational Halt

Name	Offset	Length	Type	Value/Description
Message Type	0	1	"h"	Operational Halt
Stock Locate	1	2	Integer	Locate code uniquely assigned to the security symbol for the day.
Tracking Number	3	2	Integer	Nasdaq internal tracking number
Timestamp	5	6	Integer	Time at which the Operational Halt message was generated. Refer to Data Types for field processing notes.
Stock	11	8	Alpha	Denotes the security symbol for the issue in Nasdaq execution system
Market Code	19	1	Alpha	"Q": Nasdaq "B": BX "X": PSX
Operational Halt Action	20	1	Alpha	"H": Operationally Halted on the identified Market "T": Operational Halt has been lifted and Trading resumed

4.3 Add Order Message

An Add Order Message indicates that a new order has been accepted by the Nasdaq BX system and was added to the displayable book. The message includes a day-unique Order Reference Number used by Nasdaq BX to track the order.

Nasdaq BX will support two variations of the Add Order message format.

4.3.1 Add Order – No MPID Attribution

This message will be generated for unattributed orders accepted by the Nasdaq BX system. (Note: If a firm wants to display a MPID for unattributed orders, Nasdaq BX recommends that it use the MPID of "NSDQ".)

Add Order Message

Name	Offset	Length	Value	Notes
Message Type	0	1	"A"	Add Order – No MPID Attribution Message.
Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	Nasdaq BX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight.
Order Reference Number	11	8	Integer	The unique reference number assigned to the new order at the time of receipt.
Buy/Sell Indicator	19	1	Alpha	The type of order being added. "B" = Buy Order. "S" = Sell Order.
Shares	20	4	Integer	The total number of shares associated with the order being added to the book.
Stock	24	8	Alpha	Stock symbol, right padded with spaces
Price	32	4	Price (4)	The display price of the new order. Refer to Data Types for field processing notes.

4.3.2 Add Order with MPID Attribution

This message will be generated for attributed orders and quotations accepted by the Nasdaq BX system.

Add Order - MPID Attribution Message				
Name	Offset	Length	Value	Notes
Message Type	0	1	"F"	Add Order – No MPID Attribution Message.
Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	Nasdaq BX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight.
Order Reference Number	11	8	Integer	The unique reference number assigned to the new order at the time of receipt.
Buy/Sell Indicator	19	1	Alpha	The type of order being added. "B" = buy order. "S" = sell order.
Shares	20	4	Integer	The total number of shares associated with the order being added to the book
Stock	24	8	Alpha	Stock symbol, right padded with spaces
Price	32	4	Price (4)	The display price of the new order. Refer to Data Types for field processing notes.
Attribution	36	4	Alpha	Nasdaq Market participant identifier associated with the entered order

4.4 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, ITCH 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 BX 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.

4.4.1 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 reference number if that order is executed in several parts. The multiple Order Executed Messages on the same order are cumulative.

By combining the executions from both types of Order Executed Messages and the Trade Message, it is possible to build a complete view of all non-cross executions that happen on Nasdaq BX. Cross execution information is available in one bulk print per symbol via the Cross Trade Message.

Order Executed Message				
Name	Offset	Length	Value	Notes
Message Type	0	1	"E"	Add Order – No MPID Attribution Message
Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	Nasdaq BX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight

Order Reference Number	11	8	Integer	The unique reference number assigned to the new order at the time of receipt
Executed Shares	19	4	Integer	The number of shares executed
Match Number	23	8	Integer	The Nasdaq BX generated day unique Match Number of this execution. The Match Number is also referenced in the Trade Break Message

4.4.2 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, Nasdaq BX 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 data in time-and-sales displays or volume calculations, Nasdaq BX recommends 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"	Add Order – No MPID Attribution Message
Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	Nasdaq BX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight
Order Reference Number	11	8	Integer	The unique reference number assigned to the new order at the time of receipt
Executed Shares	19	4	Integer	The number of shares executed
Match Number	23	8	Integer	The Nasdaq BX generated day unique Match Number of this execution. The Match Number is also referenced in the Trade Break Message
Printable	31	1	Alpha	Indicates if the execution should be reflected on time and sales displays and volume calculations "N" = Non-Printable "Y" = Printable
Execution Price	32	4	Price(4)	The Price at which the order execution occurred. Refer to Data Types for field processing notes

4.4.3 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

Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	Nasdaq BX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight
Order Reference Number	11	8	Integer	The reference number of the order being canceled
Cancelled Shares	19	4	Integer	The number of shares being removed from the display size of the order as a result of a cancellation

4.4.4 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 must be removed from the book.

Order Delete Message				
Name	Offset	Length	Value	Notes
Message Type	0	1	"D"	Order Delete Message
Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	Nasdaq BX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight
Order Reference Number	11	8	Integer	The reference number of the order being canceled

4.4.5. Order Replace Message

This message is sent whenever an order on the book has been cancel-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. Since the side, stock symbol and attribution (if any) cannot be changed by an Order Replace event, these fields are not included in the message. Firms should retain the side, stock symbol and MPID from the original Add Order message.

Order Replace Message				
Name	Offset	Length	Value	Notes
Message Type	0	1	"U"	Order Replace Message
Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	Nasdaq BX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight
Original Order Reference Number	11	8	Integer	The original order reference number of the order being replaced
New Order Reference Number	19	8	Integer	The new reference number for this order at time of replacement Please note that the Nasdaq BX system will use this new order reference number for all subsequent updates

Shares	27	4	Integer	The new total displayed quantity
Price	31	4	Price (4)	The new display price for the order Please refer to Data Types for field processing notes

4.5 Trade Messages

4.5.1. 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 Nasdaq BX cross events.)

Since no Add Order Message is generated when a non-displayed order is initially received, Nasdaq BX cannot use the Order Executed messages for all matches. Therefore this message indicates 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 BX 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 BX execution system display.

Trade Message (Non-Cross)

Name	Offset	Length	Value	Notes
Message Type	0	1	"P"	Trade Message
Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	Nasdaq BX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight.
Order Reference Number	11	8	Integer	The unique reference number assigned to the order on the book being executed. Effective December 6, 2010, Nasdaq BX will populate the Order Reference Number field within the Trade (Non-Cross) message as zero. For the binary versions of the BX TotalView-ITCH data feeds, the field will be null-filled bytes (which encodes sequence of zero)
Buy/Sell Indicator	19	1	Alpha	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	20	4	Integer	The number of shares being matched in this execution
Stock	24	8	Alpha	Stock Symbol, right padded with spaces
Price	32	4	Price (4)	The match price of the order Please refer to Data Types for field processing notes

Match Number	36	8	Integer	The Nasdaq BX generated session unique Match Number for this trade The Match Number is referenced in the Trade Break Message
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4.5.2. Cross Trade Message

Cross Trade message indicates that Nasdaq BX has completed its cross process for a specific security. Nasdaq BX sends out a Cross Trade message for all active 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 each security has been completed. (Note: For the halted / paused securities, firms should use the Trading Action message to determine when an issue has been released for trading.)

For most issues, 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.

Trade Message (Non-Cross)

Name	Offset	Length	Value	Notes
Message Type	0	1	"Q"	Cross Trade Message
Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	Nasdaq BX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight.
Shares	11	8	Integer	The number of shares matched in the Nasdaq BX Cross.
Stock	19	8	Alpha	Stock symbol, right padded with spaces
Cross Price	27	4	Price (4)	The price at which the cross occurred. Refer to Data Types for field processing notes.
Match Number	31	8	Integer	The Nasdaq BX generated day-unique Match Number of this execution.
Cross Type	39	1	Alpha	The Nasdaq BX cross session for which the message is being generated. "O" = Nasdaq BX Opening Cross. "C" = Nasdaq BX Closing Cross. "H" = Cross for IPO and halted / paused securities. "I" = Nasdaq BX Cross Network: Intraday Cross and Post-Close Cross

4.5.3. Broken Trade / Order Execution Message

The Broken Trade Message is sent whenever an execution on Nasdaq BX is broken. An execution may be broken if it is found to be "clearly erroneous" pursuant to [Nasdaq's Clearly Erroneous Policy](#). A trade break is final; once a trade is broken, it cannot be reinstated.

Firms that use the ITCH 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 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.
Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	Nasdaq BX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight.
Match Number	11	8	Integer	The Nasdaq BX 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.

4.6 Net Order Imbalance Indicator (NOII) Message

Nasdaq BX disseminates NOII data at 5-second intervals in the minutes leading up to the [Nasdaq Opening Cross](#) and [Nasdaq Closing Cross](#).

- For the Nasdaq Opening Cross, NOII messages will be disseminated during the two minutes leading up to the start of market hours.
- For the Nasdaq IPO, Halt and Imbalance Crosses, NOII messages will be disseminated during the quote only period. The first NOII message will be disseminated approximately five seconds after the Stock Trading Action message with the "Q" or "R" action value is disseminated.
- For the Nasdaq Closing Cross, NOII messages will be disseminated during the ten minutes leading up to the end of market hours.

NOII Message

Name	Offset	Length	Value	Notes
Message Type	0	1	"I"	NOII Message
Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	Nasdaq BX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight.
Paired Shares	11	8	Integer	The total number of shares that are eligible to be matched at the Current Reference Price.
Imbalance Shares	19	8	Integer	The number of shares not paired at the Current Reference Price.
Imbalance Direction	27	1	Alpha	The market side of the order imbalance. "B" = buy imbalance "S" = sell imbalance "N" = no imbalance

"O" = Insufficient orders to calculate

Stock	28	8	Alpha	Stock symbol, right padded with spaces
Far Price	36	4	Price (4)	A hypothetical auction-clearing price for cross orders only. Refer to Data Types for field processing notes.
Near Price	40	4	Price (4)	A hypothetical auction-clearing price for cross orders as well as continuous orders. Refer to Data Types for field
Current Reference Price	44	4	Price (4)	The price at which the NOII shares are being calculated. Refer to Data Types for field processing notes.
Cross Type	48	1	Alpha	The type of Nasdaq BX cross for which the NOII message is being generated "O" = Nasdaq BX Opening Cross "C" = Nasdaq BX Closing Cross "H" = Cross for IPO and halted / paused securities
Price Variation Indicator	49	1	Alpha	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

4.7 Price Improvement Indicator (PII)

Indicates price improving interest of the Bid, Ask or both the Bid and Ask for a security.

Retail Interest Message

Name	Offset	Length	Value	Notes
Message Type	0	1	"N"	Price Improvement (PI) message
Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	Nasdaq BX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight.
Stock	11	8	Alpha	Stock symbol, right padded with spaces

Interest Flag	19	1	Alpha	<p>“B” = PI orders available on the buy side</p> <p>“S” = PI orders available on the sell side</p> <p>“A” = PI orders available on both sides (buy and sell)</p> <p>“N” = No PI orders available</p>
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5 Support

- For general product support for Nasdaq BX data feeds, please contact Nasdaq Global Information Services at +1 301 978 5307 or dataproductions@nasdaq.com.
- For technical support for Nasdaq BX data feeds, please contact Nasdaq Global Software Development at devsupport@nasdaq.com.

Appendix A

Documentation Revision Control Log

May 3, 2018: BX TotalView-ITCH Version 5.0

Nasdaq made the decision to fall back to the previous version number to avoid customer confusion related to different sequencing between the version number of the product specifications and the version number of the actual product code.

March 3, 2018: BX TotalView-ITCH Version 5.1

Released a new version of Nasdaq BX TotalView-ITCH documentation to add a new Operational Halt message (Section 4.2.7) to indicate the current Operational Status of a security to the trading community.

November 13, 2017: BX TotalView-ITCH Version 5.0

There are currently no plans to add the LULD Auction Collars on Nasdaq BX. Should a decision be made to incorporate the messages on Nasdaq BX, the inactive (grayed out fields – section 4.2.6) will be activated to allow LULD Auction Collars message to disseminate on Nasdaq BX TotalView-ITCH.

September 12, 2017: BX TotalView-ITCH Version 5.0

Nasdaq added a new Market Category code in the Symbol Directory messages for the Investors' Exchange, LLC to distinguish IEX-listed issues. New market category code is “V”.

September 6, 2017: BX TotalView-ITCH Version 5.0

Revisions to spelling and format were made.

December 5, 2014: BX TotalView-ITCH Version 5.0

Released a new version of BX TotalView-ITCH documentation to include missing Issue Sub-Type Codes (Appendix E):

- AI – Alpha Indexes ETNs
- CO – Collateralized Mortgage Obligation
- EU – Equity Units
- F – HOLDRS

IR – Interest Rate
IW – Index Warrant
J – Corporate Backed Trust Security
PP – Poison Pill

Q – Closed -End Funds
RT – REIT
SC – Spot Rate Closing
SI – Spot Rate Intraday
WC – World Currency Option
X – Trust
Y – Other
Z – NA

July 2, 2014: BX TotalView-ITCH Version 5.0

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

Per Data Technical News #2014-18, added the PII message (Message Type “N”)

June 12, 2014: BX TotalView-ITCH Version 5.0

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”

October 1, 2013: BX TotalView-ITCH Version 5.0

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

Added stock symbol to several market data messages

Clarified interpretation of the levels in the MWCB Decline Levels Message

August 2, 2013: BX TotalView-ITCH Version 5.0

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

Inclusion of the Appendices for Issue Classification and Issue Sub-Type
Changed length and values of the Levels in the MWCB Decline Level Message
Updated offsets in the Symbol Directory message
Revised Timestamp format
Moved positioning of the Symbol Locate and Tracking Number fields

July 10, 2013: BX TotalView-ITCH Version 5.0

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

Incorporation of Symbol Locator Codes
Added Enhanced Symbol Directory
Added Market-Wide Circuit Breaker (MWCB) Messaging

- o MWCB Decline Level Message
- o MWCB Status Message

Addition of an internal tracking number to multiple messages
Addition of ‘C’ to the Financial Status Indicator field in the Symbol Directory Messag

March 11, 2013: BX TotalView-ITCH Version 4.1

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: BX TotalView-ITCH Version 4.1

NASDAQ OMX added the following Trading Action Reason Code:

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

January 8, 2013: BX TotalView-ITCH Version 4.1

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

November 6, 2012: BX TotalView-ITCH Version 4.1

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: BX TotalView-ITCH Version 4.1

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

December 3, 2010: BX TotalView-ITCH Version 4.1

NASDAQ OMX clarifies that the Trade (Non-Cross) message format is accurate and the Timestamp field is applicable to this message. In addition, NASDAQ OMX updated the Regulation SHO Restriction message to include a Timestamp field and adjusted all offsets appropriately.

October 27, 2010: BX TotalView-ITCH Version 4.1

NASDAQ OMX updated the Trade (Non-Cross) message format to remove the Timestamp field as this not applicable to this message. In addition, all offsets were updated appropriately.

October 6, 2010: BX TotalView-ITCH Version 4.1

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: BX TotalView-ITCH Version 4.1

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: BX TotalView-ITCH Version 4.1

NASDAQ OMX added a new Trading State code value of “V” to the Stock Trading Action message to denote a NASDAQ Volatility Guard trading pause.

May 25, 2010: BX TotalView-ITCH Version 4.1

NASDAQ OMX added two new Trading Action Reason code values (T5 and T7) for single security trading pause situations.

January 26, 2010 – BX TotalView-ITCH Version 4.1 (New Symbology)

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

Increased length of the symbol field from 6 characters to 8 characters in multiple message formats in support of the equity symbology initiative

Modified the values for the Market Category field in Symbol Directory messages to delineate among NYSE-, NYSE Amex- and NYSE Arca-listed issues.

Added note to Appendix B to reflect that NASDAQ OMX is reviewing its stock symbol conventions to determine if changes are needed

Appendix B

Stock Symbol Convention

For Nasdaq BX-listed issues, Nasdaq BX currently restricts its symbol length to a maximum of 8 characters. For common stock issuances, Nasdaq BX, 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 BX 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 BX 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 BX Trader website.

Appendix C

Trading Action – Reason Codes

For Nasdaq BX-listed issues, Nasdaq BX 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 abides by any regulatory trading halts and trading pauses instituted by the primary or listing market as appropriate.

For both issue types, Nasdaq BX may also halt trading for operational reasons.

Nasdaq BX will send out a trading action message to inform its market participants when the trading status of an issue changes. For informational purposes, Nasdaq BX also attempts to provide the reason for each trading action update. For bandwidth efficiency reasons, Nasdaq BX uses a 4-byte code for the reason on its outbound data

Reason Codes For Trading Halt Actions

feeds.

Code	Value
T1	Halt NewsPending
T2	Halt News Disseminated
T5	Single Security Trading Pause In Effect
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
O1	Operations Halt; Contact Market Operations
LUDP	Volatility Trading Pause
LUDS	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
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 BX Securities Only)
IPOE	IPO Security — Positioning Window Extension (Nasdaq BX Securities Only)
Space	Reason Not Available
T3	News and Resumption Times
T7	Single Security Trading Pause / Quotation Only Period

Appendix D

Issue Classification Values

Identifies the security class for the issue as assigned by Nasdaq BX

Codes for Issue Classification Values	
Code	Value
A	American Depository Share
B	Bond
C	Common Stock
F	Depository Receipt
I	144A
L	Limited Partnership
N	Notes
O	Ordinary Share
P	Preferred Stock
Q	Other Securities
R	Right
S	Shares of Beneficial Interest
T	Convertible Debenture
U	Unit
V	Units/Benef Int
W	Warrant

Appendix E

Issue Sub-Type Values

Codes for Issue Classification Values	
Code	Value
A	Preferred Trust Securities
AI	Alpha Index ETNs
B	Index Based Derivative
C	Common Shares
CB	Commodity Based Trust Shares
CF	Commodity Futures Trust Shares
CL	Commodity-Linked Securities
CM	Commodity Index Trust Shares
CO	Collateralized Mortgage Obligation
CT	Currency Trust Shares
CU	Commodity-Currency-Linked Securities
CW	Currency Warrants
D	Global Depository Shares
E	ETF-Portfolio Depository Receipt
EG	Equity Gold Shares
EI	ETN-Equity Index-Linked Securities
EM	NextShares Exchange Traded Managed Fund*
EN	Exchange Traded Notes
EU	Equity Units
F	HOLDERS
FI	ETN-Fixed Income-Linked Securities
FL	ETN-Futures-Linked Securities
G	Global Shares
I	ETF-Index Fund Shares
IR	Interest Rate
IW	Index Warrant
IX	Index-Linked Exchangeable Notes
J	Corporate Backed Trust Security
L	Contingent Litigation Right

LL	Identifies securities of companies that are set up as a Limited Liability Company (LLC)
M	Equity-Based Derivative
MF	Managed FundShares
ML	ETN-Multi-Factor Index-Linked Securities
MT	Managed Trust Securities
N	NY Registry Shares
O	Open Ended Mutual Fund
P	Privately Held Security
PP	Poison Pill
PU	Partnership Units
Q	Closed-End Funds
R	Reg-S
RC	Commodity-Redeemable Commodity-Linked Securities
RF	ETN-Redeemable Futures-Linked Securities
RT	REIT
RU	Commodity-Redeemable Currency-Linked Securities
S	SEED
SC	Spot Rate Closing
SI	Spot Rate Intraday
T	Tracking Stock
TC	Trust Certificates
TU	Trust Units
U	Portal
V	Contingent Value Right
W	Trust Issued Receipts
WC	World Currency Option
X	Trust
Y	Other
Z	Not Applicable

* NextShares Exchange Traded Managed Funds (ETMFs) launched in February 2016. NextShares prices will be stated in proxy price on this feed. For more information, please refer to the [NextShares Homepage](#).