

# NASDAQ NOIView Version 2.1

## **1. Overview**

NASDAQ NOIView – Version 2.1 is being released in association of the equity symbology initiative and will support issue symbols up to 8 characters in total length.

NASDAQ NOIView 2.1 is a direct data feed product offered by The NASDAQ Stock Market<sup>®</sup>, which features the following data elements:

- Net Order Imbalance Data: In the minutes leading up to the NASDAQ Opening and Closing Crosses as well as IPO/Halt/Imbalance Cross, NASDAQ disseminates the indicative clearing price and net order imbalance in the NASDAQ execution system. Because the calculation includes non-displayable as well as displayable order types, the net order imbalance indicator (NOII) is the best predictor of the NASDAQ opening and closing prices available to the public.
- Administrative messages, such trading actions and symbol directory for NASDAQ-listed issues:
  - Stock trading action messages are used to inform market participants when a security is halted / paused, released for quotation and released for trading.
  - Stock symbol Directory messages provide basic security data such as the market tier and Financial Status Indicator.

Please note that NOIView is a filtered NASDAQ data feed product. The NOII and administrative messages are also supported on the NASDAQ TotalView-ITCH and TotalView-Aggregated data feed options.

## **2. Architecture**

The NOIView 2.1 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 NOIView 2.1 protocol are typically delivered using a higher level protocol that takes care of sequencing and delivery guarantees.

NASDAQ offers the NOIView 2.1 data feed in three protocol options:

- [SoupTCP](#)
- [Compressed](#) via SoupTCP
- [MoldUDP](#)

Please note that, for each data center connection, NOIView 2.1 messages will be disseminated via a single outbound data channel.

### 3. Data Types

All numeric fields are represented in ASCII digits and are right-justified. Padding spaces appear on the left as necessary.

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.

Timestamp reflects the NASDAQ system time at which the outbound message was generated. NASDAQ states time as the number of milliseconds past midnight. The time zone is U.S. Eastern Time.

All alpha fields are left-justified. Padding spaces appear on the right as necessary.

### 4. Message Formats

NASDAQ NOIView 2.1 supports three basic types of messages:

- System Events
- NASDAQ Net Order Imbalance Indicators
- Administrative Data

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

#### 4.1 System Event Message

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

SYSTEM EVENT MESSAGE				
Name	Offset	Length	Value	Notes
Timestamp	0	8	Numeric	Time at which the system event was generated. Time is represented as number of seconds and milliseconds past midnight, Eastern Time (ET).
Message Type	8	1	"S"	System Event Message
Event Code	9	1	Alpha	Refer to System Event Codes below

SYSTEM EVENT CODES	
Code	Explanation
"O"	<i>Start of Messages.</i> This is always the first message sent in any trading day.

## NOIVIEW INTERFACE SPECIFICATIONS

"S"	<i>Start of System Hours.</i> This message indicates that NASDAQ 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.
"X"	<i>Clear NOII - Opening Cross Data.</i> This message signals that firms may clear NOII cache for the regular Opening Cross.
"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> It indicates that NASDAQ is now closed and will not accept any new orders.
"C"	<i>End of Messages.</i> This is always the last message sent in any trading day. For initial implementation of the integrated NASDAQ system, this message will be disseminated between 8:00 and 9:00 p.m., ET.

### 4.2 Administrative Messages

#### 4.2.1 Stock Directory

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

<b>STOCK DIRECTORY</b>				
<b>Name</b>	<b>Offset</b>	<b>Length</b>	<b>Value</b>	<b>Notes</b>
Timestamp	0	8	Numeric	Time at which the directory message was generated. Refer to Data Types for field processing notes.
Message Type	8	1	"R"	Stock Directory Message
Stock	9	8	Alpha	Denotes the security symbol for the issue in the NASDAQ execution system.
Market Category	17	1	Alpha	Indicates Listing market or listing market tier for the issue  "N" = New York Stock Exchange (NYSE) "A" = NYSE Amex "P" = NYSE Arca "Q" = NASDAQ Global Select Market <sup>SM</sup> "G" = NASDAQ Global Market <sup>SM</sup> "S" = NASDAQ Capital Market <sup>®</sup> "Z" = BATS BZX Exchange

## NOIVIEW INTERFACE SPECIFICATIONS

Financial Status Indicator	18	1	Alpha	<p>For NASDAQ-listed issues, this field indicates when a firm is not in compliance with NASDAQ continued listing requirements.</p> <p>"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</p> <p>Space = Company is in compliance, if NASDAQ-listed issue</p>
Round Lot Size	19	6	Numeric	Indicates the number of shares that represent a round lot for the issue
Round Lots Only	25	1	Alpha	<p>Indicates if NASDAQ system limits order entry for issue</p> <p>"Y" = only round lots are accepted in this stock  "N" = odd/mixed lots are allowed</p>

### 4.2.2 Stock Trading Action

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

After the start of system hours, NASDAQ will use the Trading Action message to relay changes in trading status for an individual 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
Timestamp	0	8	Numeric	Time at which the stock trading action message was generated
Message Type	8	1	"H"	Stock Trading Action Message
Stock	9	8	Alpha	Denotes the security symbol for the issue in the NASDAQ Single Book.

## NOIVIEW INTERFACE SPECIFICATIONS

Current Trading State	17	1	Alpha	Indicates the current trading state for the stock. Allowable values:  "H" = Halted or paused 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
Reason	18	4	Alpha	Reflects the Market Ops or MarketWatch code for the trading state change. Refer to Appendix A for values.

### 4.2.3 Reg SHO Short Sale Price Test Restricted Indicator

In February 2011, 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.

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
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 Net Order Imbalance Indicator (NOII)

NASDAQ disseminates NOII data at 5-second intervals in the minutes leading up to the [NASDAQ Opening and Closing Crosses](#) as well as the [IPO/Halt Crosses](#):

## NOIVIEW INTERFACE SPECIFICATIONS

- For the standard NASDAQ Opening Cross, NOII messages will be disseminated during the two minutes leading up to the start of market hours.
- For the NASDAQ cross for IPO and halted / paused securities, 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.

<b>NOII MESSAGE</b>				
<b>Name</b>	<b>Offset</b>	<b>Length</b>	<b>Value</b>	<b>Notes</b>
Timestamp	0	8	Numeric	Time at which the NOII message was generated
Message Type	8	1	"I"	NOII Message
Paired Shares	9	9	Numeric	Indicates the total number of shares that are eligible to be matched at the Current Reference Price.
Imbalance Shares	18	9	Numeric	Number of shares not paired at the Current Reference Price.
Imbalance Direction	27	1	Alpha	Indicates the market side of the imbalance  "B" = buy imbalance "S" = sell imbalance "N" = no imbalance "O" = insufficient orders to calculate
Stock	28	8	Alpha	Denotes the security symbol for which the NOII message is being generated
Far Price	36	10	Price	A hypothetical auction-clearing price for cross orders only.
Near Price	46	10	Price	A hypothetical auction-clearing price for cross orders as well as continuous orders.
Current Reference Price	56	10	Price	Indicates price at which the NOII shares are being calculated.
Cross Type	66	1	Alpha	Denotes the type of NASDAQ cross for which the NOII message is being generated  "O" = Open Cross "C" = Close Cross "H" = Intra-day Opening Cross for IPO and Halted / Paused securities

## NOIVIEW INTERFACE SPECIFICATIONS

Price Variation Indicator	67	1	Alpha	<p>This field indicates the absolute value of the percentage of deviation of the Near Indicative Clearing Price to the nearest Current Reference Price.</p> <p>"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</p>
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### 4.4 Cross Trade Message

Cross Trade message indicates that NASDAQ has completed its cross process for a specific security. NASDAQ 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.

CROSS TRADE MESSAGE				
Name	Offset	Length	Value	Notes
Timestamp	0	8	Numeric	Time at which the NOII message was generated
Message Type	8	1	"Q"	Cross Trade Message
Shares	9	9	Numeric	The number of shares matched in the NASDAQ Cross.
Stock	18	8	Alpha	The security symbol associated with the cross trade message.
Cross Price	26	10	Numeric	The price at which the cross occurred. Refer to Data Types for field processing notes.
Match Number	36	12	Numeric	The NASDAQ generated day-unique Match Number of this execution.
Cross Type	48	1	Alpha	The NASDAQ cross session for which the message is being generated. "O" = NASDAQ Opening Cross. "C" = NASDAQ Closing Cross. "H" = Cross for IPO and halted / paused securities.

## **5. Support**

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



## Appendix A

### Trading Action – Reason Codes

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

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

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

<b>REASON CODES FOR TRADING HALT ACTIONS</b>	
<b>Code</b>	<b>Value</b>
T1	Halt News Pending
T2	Halt News Disseminated
T5	Single Stock 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

<b>REASON CODES FOR QUOTATION RESUMPTION ACTIONS</b>	
<b>Code</b>	<b>Value</b>
T3	News and Resumption Times
T7	Single Stock 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 Securities Only)
IPOE	IPO Security – Positioning Window Extension (NASDAQ Securities Only)
Space	Reason Not Available

## NOIVIEW INTERFACE SPECIFICATIONS

*Note: At this time, NASDAQ OMX does not support Reason codes for Trading Resumption actions. NASDAQ OMX also does not support the Reason codes in the pre-opening Trading Action spins.*

## Appendix B

### Documentation Revision Control Log

#### March 9, 2013: NASDAQ NOIView Version 2.1

Released a new version of the NOIView documentation to support the following changes:

- 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: NASDAQ NOIView Version 2.1

Released a new version of the NOIView documentation to support the following changes:

- Added the following Trading Action Reason Code:
  - MWC0 - Market Wide Circuit Breaker Halt – Carry over from previous day
- Removed the Trading State, “R”, from the Stock Trading Action message.

#### November 6, 2012: NASDAQ NOIView Version 2.1

Released a new version of the NOIView 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 values related to the Volatility Guard Program. Removed Trading State, “V”. Eliminated Trading Action Reason Codes, V1 and V2.

#### November 1, 2011: NASDAQ NOIView Version 2.1

NASDAQ OMX added a new Market Category code in Stock Directory messages for the BATS BZX Exchange to distinguish BATS-listed issues. New market category code is “Z”.

#### May 2, 2011: NASDAQ NOIView Version 2.1

NASDAQ OMX added Cross Trade message format to the NOIView specification document. NASDAQ OMX will begin to disseminate the Cross Trade message on NOIView in the June 2011 timeframe.

#### April 6, 2011: NASDAQ NOIView Version 2.1

NASDAQ OMX added two new Trading Action – Reason codes to Appendix C for the NASDAQ Volatility Guard pilot program. New Reason codes were V1 and V2.

#### November 11, 2010: NASDAQ NOIView Version 2.1

NASDAQ OMX fixed an error in the Stock Trading Action message format introduced in July 2010.

#### November 4, 2010: NASDAQ NOIView Version 2.1

NASDAQ OMX updated the Regulation SHO message definition to reflect the new SEC implementation date.

#### July 14, 2010: NASDAQ NOIView Version 2.1

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: NASDAQ NOIView Version 2.1

## NOIVIEW INTERFACE SPECIFICATIONS

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

### **May 25, 2010: NASDAQ NOIView Version 2.1**

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

### **January 26, 2010: NASDAQ NOIView Version 2.1**

NASDAQ OMX releases a NOIView – Version 2.1 in support of equity symbology initiative. NOIView – Version 2.1 includes the following format 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.

In addition, NASDAQ OMX updated the NOIView document to reflect that NASDAQ Opening and Closing Cross process now includes NYSE, NYSE Amex and NYSE Arca issues.

### **February 20, 2007: NASDAQ NOIView Version 2.0**

NASDAQ releases the NOIView 2.0 specification document to the public.

For efficiency reasons, NASDAQ plans to move the NOIView product to a new system platform in the second quarter of 2007. In association with the platform change, NASDAQ will also modify the data formats to support 6-byte issue symbols as required under the new NASDAQ symbol plan. Please see [NASDAQ Vendor Alert #2007-012](#) for the detailed customer migration plans.