



Nordic Equity TotalView - ITCH

INET Nordic

Nordic Equities Markets



Revision 3.04.2
18 Nov 2024
Approved

Copyright © 2024, Nasdaq, Inc. All rights reserved.

All content in this document is owned, or licensed, by Nasdaq, Inc. or its affiliates ('Nasdaq'). Unauthorized use is prohibited without written permission of Nasdaq.

While reasonable efforts have been made to ensure that the contents of this document are accurate, the document is provided strictly "as is", and no warranties of accuracy are given concerning the contents of the information contained in this document, including any warranty that the document will be kept up to date. Nasdaq reserves the right to change details in this document without notice. To the extent permitted by law no liability (including liability to any person by reason of negligence) will be accepted by Nasdaq or its employees for any direct or indirect loss or damage caused by omissions from or inaccuracies in this document.

Document History

Revision	Published	Author(s)	Summary of Changes
3.0	June 8, 2015	[A. Person]	<p>Integer fields represented as binary.</p> <p>Nanosecond timestamp (UTC) + tracking number in all messages.</p> <p>New Symbol State field in the Order Book Trading Action message.</p> <p>Extension field added to the Order Book Trading Action message and removed from the NOII.</p> <p>New Note Codes bit mask field representation in the Order Book Directory message.</p> <p>Retired:</p> <ul style="list-style-type: none"> • Market Segment State message • Seconds message • Milliseconds message • Reason field of the Order Replaced message <p>Trading State field of the Order Book Trading Action message</p>
3.0	June 8, 2015		New Order Book Flush message added to messages and Appendix A - How to build an order book view. (Revision history change only.)
3.0	June 8, 2015		Corrected the offset for the last four fields in the Order Book Directory message.
3.0	June 8, 2015		<p>Updates to the Note Codes Bit Field 3 of the Order Book Directory message:</p> <p>Added a new note code ("SK")</p>
3.00.1	June 9, 2015		Modified the Order Reference Number field length to eight bytes in all messages (sections 5.3.1, 5.3.2, 5.4.1, 5.4.2, 5.4.3, 5.4.4, 5.4.6 and 5.5.1).
3.00.2	December 1, 2015		Brand name changes, no actual protocol changes.
3.01	February 26, 2016		Added two new Note Codes, "KB" and "BB", to the Note Codes Bit Fields of the Order Book Directory message (section 5.2.1).
3.02	February 22, 2017		<p>Adding in Auction On Demand – new MOII message (section 5.8), new enum value in the Cross Trade Message, Cross Type field (section 5.5.2).</p> <p>Adding new Note Codes for volume caps and new venue MIC Code fields for Nordic@Mid and AOD in the Order Book Directory message (section 5.2.1).</p>
3.02.1	March 24, 2017		Corrected Offsets in MOII message, section 5.8

Revision	Published	Author(s)	Summary of Changes
3.03	June 30, 2017		Added four new Note Codes, "PD", "SM", "EW" and "EM", to the Note Codes Bit Fields of the Order Book Directory message (section 5.2.1). Updated the Order Book Directory message to support Securitized Derivatives under MiFID II, offset 73-97
3.03.1	September 4, 2017		Added footnotes for SDRV fields in the Order Book Directory
3.03.2	November 5, 2018		Added halt reason "MMM" – Market Maker Missing
3.03.3	April 9, 2019		Added Symbol State "A" – Trading at Closing Price
3.03.4	June 27, 2019		Updated the MIC field description in the Order Book Directory message (section 5.2.1)
3.03.5	March 13, 2020		Added halt reason "UNQ" – Underlying Not Quoted in Order Book Trading Action Added Note Code "UN" – Underlying Not Quoted in Order Book Directory
3.04.0	May 26, 2021		Added new message – Execution Summary Message in 5.9 Changed specification format.
3.04.1	October 8, 2024		Changed Note Code description OB to Observation status in Order Book Directory message
3.04.2	November 18, 2024		Added field PureStream MIC in Order Book Directory message and changed description of the MIC Code field in section 5.2.1

Table of Contents

1	Overview	6
2	Architecture	7
3	Data Types	8
4	Message Header	9
5	Message Formats	10
5.1	Event and State Change Messages	10
5.1.1	System Event Message	10
5.1.2	Order Book Trading Action	10
5.2	Stock Related Messages	12
5.2.1	Order Book Directory.....	12
5.3	Add Order Message	17
5.3.1	Add Order – No MPID Attribution	17
5.3.2	Add Order – MPID Attribution.....	17
5.4	Modify Order Messages.....	18
5.4.1	Order Executed Message.....	18
5.4.2	Order Executed with Price Message	19
5.4.3	Order Cancel Message	20
5.4.4	Order Delete Message	21
5.4.5	Order Book Flush Message	21
5.4.6	Order Replace Message.....	22
5.5	Trade Messages	22
5.5.1	Trade Message (Non-Cross).....	22
5.5.2	Cross Trade Message	23
5.6	Broken Trade / Order Execution Message.....	24
5.7	Net Order Imbalance Indicator (NOII)	25
5.8	Auction On Demand Order Imbalance Indicator (MOII).....	27
5.9	Execution Summary Message	27
6	Support	29
	Appendix A - How to build an order book view	30
	Appendix B - How to build a Trade Ticker.....	31

1 Overview

ITCH for Nasdaq Nordic is a direct data feed product offered by Nasdaq Nordic and Nasdaq Baltic¹.

Nasdaq Nordic ITCH features the following data elements (in binary number format) for all securities traded via the Nasdaq Nordic execution system:

Order level data with attribution: Nasdaq Nordic will provide its full order depth using the standard ITCH format. ITCH uses a series of order messages to track the life of a customer order². The ITCH message formats supports market participant attribution.

Trade messages: To ensure that customers have complete information about Nasdaq Nordic order flow, ITCH supports a trade message to reflect a match of a non-displayable order in the system. ITCH also supports a separate trade message to reflect cross transactions.

Net Order Imbalance Data: In the minutes leading up to the Opening and Closing Crosses as well as intraday crosses, halt releases and volatility interruptions, the system disseminates the indicative equilibrium price, the imbalance direction and quantity, or the best bid and offer in each order book. Because the calculation includes non-displayable as well as displayable order types, the Net Order Imbalance Indicator (NOII) is the best predictor of the opening and closing prices available to the public.

Administrative messages, such as 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.

Event controls, such as start of day, end of day and the state of the different order books.

¹ Nasdaq Copenhagen, Nasdaq Helsinki, Nasdaq Iceland, Nasdaq Riga, Nasdaq Stockholm, Nasdaq Tallinn and Nasdaq Vilnius are respectively brand names for Nasdaq Copenhagen A/S, Nasdaq Helsinki Ltd, Nasdaq Iceland hf., Nasdaq Riga AS, Nasdaq Stockholm AB, Nasdaq Tallinn AS and AB Nasdaq Vilnius. Nasdaq Nordic represents the common offering by Nasdaq Copenhagen, Nasdaq Helsinki, Nasdaq Iceland and Nasdaq Stockholm. Nasdaq Baltic represents the common offering by Nasdaq Tallinn, Nasdaq Riga and Nasdaq Vilnius.

² ITCH is an outbound market data feed only. The ITCH protocol does not support order entry.

2 Architecture

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

Nasdaq Nordic offers the ITCH data feed in two protocol options:

- **SoupBinTCP**
- **MoldUDP64**

Nasdaq Nordic can add new message fields and message types to this specification. New message fields will be added to the end of the message. Participants should use decoders that ignore unknown message types and messages that expand in length.

3 Data Types

All **integer** fields are unsigned big-endian (network byte order) binary encoded numbers.

All **alpha** and **alpha-numeric** 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 TotalView-ITCH is 200,000.0000 (decimal, 77359400 hex).

Timestamps are represented as nanoseconds since midnight UTC.

Bit masks are fields where every set bit represents a certain value.

4 Message Header

All ITCH messages have a header of three fields:

- The **Message Type** that identifies the type of message.
- The **Timestamp** that specifies the nanosecond time of the event.
- The **Tracking Number** that provides a sequence in the case multiple events happen at the same timestamp value.

5 Message Formats

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

5.1 Event and State Change Messages

5.1.1 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.
Timestamp	1	8	Timestamp	Nanoseconds since midnight.
Tracking Number	9	2	Integer	Nasdaq Nordic internal tracking number
Event Code	11	1	Alpha-numeric	<ul style="list-style-type: none"> "O" - Start of Messages "C" - End of Messages

Event Codes		
Code	Name	Comments
"O"	Start of Messages	The start of day message is the first message sent in any trading day.
"C"	End of Messages	This is always the last message sent in any trading day.

5.1.2 Order Book Trading Action

This administrative message is used to indicate the current trading status of a security to the trading community.

Prior to the start of system hours, a Trading Action spin will be sent out. In the spin, the Nasdaq Nordic will send out an Order Book Trading Action message for all 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 Nordic platform at the start of the system hours. Please note that securities may be halted in the system for both regulatory and operational reasons.

After the start of system hours, the Nasdaq Nordic will use the Trading Action message to relay changes in trading status for an individual security. Messages will be sent when a security transitions from one state to another or is halted, is released for auction, or is released for trading after a halt.

Order Book Trading Action				
Name	Offset	Length	Value	Notes
Message Type	0	1	"H"	Stock Trading Action Message.
Timestamp	1	8	Timestamp	Nanoseconds since midnight.
Tracking Number	9	2	Integer	Nasdaq Nordic internal tracking number
Order Book	11	4	Integer	Denotes the identity (order book id) of an order book.
Symbol State	15	1	Alpha-numeric	<ul style="list-style-type: none"> • "C" = Closed • "P" = Pre-Open • "O" = Opening Auction • "T" = Continuous Trading • "I" = Scheduled Intraday Auction • "L" = Closing Auction • "S" = Post-Trade • "H" = Halted • "Q" = Auction Period • "A" = Trading at Closing Price
Extension	16	1	Alpha	<p>Specifies whether the cross has been extended or not. May apply to Symbol States: "O"; "I"; "L" and "Q".</p> <ul style="list-style-type: none"> • "E" = cross extension
Reason	17	4	Alpha-numeric	<p>The Halt Reason code further qualifies Symbol State = "H" (Halted). It is also used for Volatility pauses.</p> <ul style="list-style-type: none"> • "TH" = Trading Halt • "RH" = Regulatory Halt • "MH" = Matching Halt • "TS" = Technical Stop • "KO" = Trading Halt – Knock Out • "VHD" = Volatility Halt – Dynamic • "VHS" = Volatility Halt – Static • "MMM" = Market Maker Missing • "UNQ" = Underlying Not Quoted • Space = Reason Not Available

Symbol States		
Code	Name	Comments
"C"	Closed	Order books are closed.
"P"	Pre-Open	Order books are open for full order management. No automatic matching.
"O"	Opening Auction	Order books are open for full order management. No automatic matching. Net Order Imbalance dissemination.
"T"	Continuous Trading	Order books are open for full order management and automatic matching occurs.
"I"	Scheduled Intraday Auction	Intraday auction has begun. Order books are open for full order management, but no automatic matching. Net Order Imbalance dissemination.
"L"	Closing Auction	Closing Auction has begun. Order books are still open for full order management, but no automatic matching. Net Order Imbalance dissemination.
"S"	Post-Trade	Only volume reduction of GTC orders is allowed. It is possible to receive Broken Trade messages and Order Delete messages after the End of Day.
"H"	Halted	The order book is trading halted.
"Q"	Auction Period	Used for unscheduled intraday auctions as volatility and halt release auctions.
"A"	Trading at Closing Price	Trading at closing price has begun. Only orders intended for trading at closing price will be accepted. Automatic matching takes places at the price of the closing auction.

5.2 Stock Related Messages

5.2.1 Order Book Directory

At the start of each trading day, Nasdaq Nordic disseminates order book directory messages for all active order books³, including halted securities, in the Nasdaq Nordic execution system.

³ Please note that order books only available for trade reporting are not included in the ITCH flow.

Receivers should note that Order Book Directory messages can also be sent out during the day, in the relatively rare event that any of the fields change intra-day or a new order book is admitted to trading.

Order Book Directory				
Name	Offset	Length	Value	Notes
Message Type	0	1	"R"	Order Book Directory Message
Timestamp	1	8	Timestamp	Nanoseconds since midnight.
Tracking Number	9	2	Integer	Nasdaq Nordic internal tracking number
Order Book	11	4	Integer	Denotes the primary identifier of an order book.
Symbol	15	16	Alpha-numeric	Human-readable name of the security.
ISIN	31	12	Alpha-numeric	ISIN code identifying security.
Financial Product	43	1	Integer	Values: <ul style="list-style-type: none"> • 1 = Stock • 2 = Equity Warrant • 3 = Equity Right • 4 = Bond • 6 = Lottery Bond Series • 7 = Convertible • 8 = Warrant • 11 = Unit Trust Certificate • 12 = Index Fund Unit
Trading Currency	44	3	Alpha	Trading currency.
MIC	47	4	Alpha	Market Identifier Code identifying the Market. If specified, indicates that a Lit order book is applicable for this symbol.
Market Segment ID	51	2	Integer	Denotes which Market Segment this order book belongs to.
Note Codes Bit Field 1	53	1	Bit-mask	Note Codes. Logical OR to identify multiple note codes. <ul style="list-style-type: none"> • 1 = NM, New Market Company • 2 = XR, Excluding participating in right/s • 4 = SP, Excluding participating in split

Order Book Directory				
Name	Offset	Length	Value	Notes
				<ul style="list-style-type: none"> • 8 = PO, Company subject to public offer • 16 = UD, Under drawing • 32 = SR, Excluding comb. Split and issue right/s • 64 = UL, UnListed • 128 = WI, When Issued
Note Codes Bit Field 2	54	1	Bit-mask	<p>Note Codes. Logical OR to identify multiple note codes.</p> <ul style="list-style-type: none"> • 1 = BR, Company Bankruptcy • 2 = SU, Suspension • 4 = RL Removal from listing in process • 8 = SL, Other surveillance list reason • 16 = TO, A significant reverse take-over pending • 32 = CS, Cent shares • 64 = RS, Reversed Split • 128 = BS, Excluding comb. Bonus & Split
Note Codes Bit Field 3	55	1	Bit-mask	<p>Note Codes. Logical OR to identify multiple note codes.</p> <ul style="list-style-type: none"> • 1 = SS, Excluding comb. Split & Redemption share • 2 = FN, First North Company • 4 = OB, Observation status • 8 = XD, Excluding dividend • 16 = FE, Foreign non-EU/EEA Entity, excluding the Faroe Islands and Greenland • 32 = SO, Sold-Out Buy-Back • 64 = SK, Soft Knock • 128 = KB, Knock-Out Buy-Back
Note Codes Bit Field 4	56	1	Bit-mask	<p>Note Codes. Logical OR to identify multiple note codes.</p> <ul style="list-style-type: none"> • 1 = BB, Buy-Back • 2 = CN, Capped By Nasdaq • 4 = CR, Capped By Regulator • 8 = CE, Capped By ESMA • 16 = CC, Cap Close • 32 = PD, Price Discrepancy Historical Average Share Classes • 64 = SM, Stressed Market • 128 = EW, Market-wide exceptional circumstance

Order Book Directory				
Name	Offset	Length	Value	Notes
Note Codes Bit Field 5	57	1	Bit-mask	<p>Note Codes. Logical OR to identify multiple note codes.</p> <ul style="list-style-type: none"> • 1 = EM, exceptional circumstances related to market maker • 2 = UN, Underlying Not Quoted • 4 – For future use • 8 – For future use • 16 – For future use • 32 – For future use • 64 – For future use • 128 – For future use
Note Codes Bit Field 6	58	1	Bit-mask	<p>Note Codes. Logical OR to identify multiple note codes.</p> <ul style="list-style-type: none"> • 1 – For future use • 2 – For future use • 4 – For future use • 8 – For future use • 16 – For future use • 32 – For future use • 64 – For future use • 128 – For future use
Note Codes Bit Field 7	59	1	Bit-mask	<p>Note Codes. Logical OR to identify multiple note codes.</p> <ul style="list-style-type: none"> • 1 – For future use • 2 – For future use • 4 – For future use • 8 – For future use • 16 – For future use • 32 – For future use • 64 – For future use • 128 – For future use
Note Codes Bit Field 8	60	1	Bit-mask	<p>Note Codes. Logical OR to identify multiple note codes.</p> <ul style="list-style-type: none"> • 1 – For future use • 2 – For future use • 4 – For future use • 8 – For future use • 16 – For future use • 32 – For future use • 64 – For future use • 128 – For future use
Round Lot Size	61	4	Integer	Indicates the number of shares that represent a round lot for the issue

Order Book Directory				
Name	Offset	Length	Value	Notes
Nordic@Mid MIC	65	4	Alpha	If specified, indicates that a Nordic@Mid order book is applicable for this symbol. The indicator is represented by the venue MIC for this order book.
AOD MIC	69	4	Alpha	If specified, indicates that an Auction On Demand order book is applicable for this symbol. The indicator is represented by the venue MIC for this order book.
Notation of Qty	73	4	Alpha	If specified, indication of the measurement units in which the quantity is expressed ⁴
Notional Amount	77	8	Price(5)	If specified, indicates the notional amount ⁴
Currency	85	3	Alpha	Indicates the currency of the notional amount ⁴
Price notation	88	1	Alpha	Populated with M if the price is expressed in monetary value ⁴
Multiplier for calculating Quantity in measurement unit	89	8	Price(6)	Multiplier to calculate quantity in measurement units. The value has 6 implied decimals. ⁴
PureStream MIC	97	4	Alpha	If specified, indicates that a PureStream order book is applicable for this symbol. The indicator is represented by the venue MIC for this order book.

Note code bit fields (1-8) each represent a set of eight note codes. Logical OR is used to find multiple note codes. A value of zero for the entire field means there is no note code set.

⁴ Only relevant for Securitized Derivatives (SDRV)

5.3 Add Order Message

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

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

5.3.1 Add Order – No MPID Attribution

This message will be generated for unattributed orders in the INET Nordic system.

Add Order Message				
Name	Offset	Length	Value	Notes
Message Type	0	1	"A"	Add Order Message.
Timestamp	1	8	Timestamp	Nanoseconds since midnight.
Tracking Number	9	2	Integer	Nasdaq Nordic internal tracking number
Order Reference Number	11	8	Integer	The unique reference number assigned to the new order. The order reference number is Increasing, but not necessarily sequential.
Buy/Sell Indicator	19	1	Alpha	The type of order being added. <ul style="list-style-type: none"> "B" = buy order. "S" = sell order.
Quantity	20	4	Integer	The total number of shares associated with the order being added to the book.
Order Book	24	4	Integer	The Order book ID for which the order is being added.
Price	28	4	Price (4)	The display price of the new order. Refer to Data Types for field processing notes.

5.3.2 Add Order – MPID Attribution

This message will be generated for attributed orders and quotations entered into the INET Nordic system.

Add Order – MPID Attribution Message				
Name	Offset	Length	Value	Notes
Message Type	0	1	"F"	Add Order Message.

Add Order – MPID Attribution Message				
Name	Offset	Length	Value	Notes
Timestamp	1	8	Timestamp	Nanoseconds since midnight.
Tracking Number	9	2	Integer	Nasdaq Nordic internal tracking number
Order Reference Number	11	8	Integer	The unique reference number assigned to the new order. The order reference number is Increasing, but not necessarily sequential.
Buy/Sell Indicator	19	1	Alpha	The type of order being added. <ul style="list-style-type: none"> “B” = buy order. “S” = sell order.
Quantity	20	4	Integer	The total number of shares associated with the order being added to the book.
Order Book	24	4	Integer	The security symbol for which the order is being added.
Price	28	4	Price (4)	The display price of the new order. Refer to Data Types for field processing notes.
Attribution	32	4	Alpha-numeric	Nasdaq Nordic market participant identifier associated with the entered order. Market Maker Orders are flagged with an attribution of “_MMO”.

5.4 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 Nordic 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.

5.4.1 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 if that order is executed in several parts. 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. 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"	Order Executed Message.
Timestamp	1	8	Timestamp	Nanoseconds since midnight.
Tracking Number	9	2	Integer	Nasdaq Nordic internal tracking number
Order Reference Number	11	8	Integer	The order reference number associated with the executed order.
Executed Quantity	19	4	Integer	The number of shares executed.
Match Number	23	4	Integer	Assigned by Nasdaq Nordic to each match executed. Each match consists of one buy and one sell. The matching buy and sell executions share the same match number. The match number is also referenced in the Trade Break Message.
MPID	27	4	Alpha-numeric	The MPID of the order, if public
MPID, counterparty	31	4	Alpha-numeric	The MPID of the counterparty, if public

5.4.2 Order Executed with Price Message

This message is sent in the relatively rare event that an order on the book is executed in whole or in part with a price different than the initial display price. Since the execution price is different than the display price of the original Add Order, Nasdaq Nordic includes a price field within this execution message.

It is possible to receive several Order Executed and Order Executed With Price Messages for the same order if that order is executed in several parts. Multiple Order Executed Messages on the same order are cumulative.

The 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 Cross Trade Message. If a firm is looking to use the data in trade tickers or volume calculations, Nasdaq 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"	Order Executed with Price Message.

Order Executed With Price Message				
Name	Offset	Length	Value	Notes
Timestamp	1	8	Timestamp	Nanoseconds since midnight.
Tracking Number	9	2	Integer	Nasdaq Nordic internal tracking number
Order Reference Number	11	8	Integer	The order reference number associated with the executed order.
Executed Quantity	19	4	Integer	The number of shares executed.
Match Number	23	4	Integer	Assigned by Nasdaq Nordic to each match executed. Each match consists of one buy and one sell. The matching buy and sell executions share the same match number. The match number is also referenced in the Trade Break Message.
Printable	27	1	Alpha	Indicates if the execution should be reflected on time and sale displays and volume calculations. <ul style="list-style-type: none"> • "N" = non-printable • "Y" = printable
Trade Price	28	4	Price (4)	The price at which the order execution occurred.
MPID, owner	32	4	Alpha-numeric	The MPID of the order, if public
MPID, counterparty	36	4	Alpha-numeric	The MPID of the counterparty, if public

5.4.3 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.
Timestamp	1	8	Timestamp	Nanoseconds since midnight.

Tracking Number	9	2	Integer	Nasdaq Nordic internal tracking number
Order Reference Number	11	8	Integer	The reference number of the order being reduced.
Canceled Quantity	19	4	Integer	The number of shares being removed from the display size of the order as the result of a cancellation.

5.4.4 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 should be removed from the book.

Order Delete Message				
Name	Offset	Length	Value	Notes
Message Type	0	1	"D"	Order Delete Message.
Timestamp	1	8	Timestamp	Nanoseconds since midnight.
Tracking Number	9	2	Integer	Nasdaq Nordic internal tracking number
Order Reference Number	11	8	Integer	The reference number of the order being canceled.

5.4.5 Order Book Flush Message

This message is sent whenever an order book is flushed, e.g. if market-by-order pre-trade transparency is not available. All remaining orders are no longer accessible and should be removed from the book.

Order Book Flush Message				
Name	Offset	Length	Value	Notes
Message Type	0	1	"Y"	Order Book Flush Message.
Timestamp	1	8	Timestamp	Nanoseconds since midnight.
Tracking Number	9	2	Integer	Nasdaq Nordic internal tracking number
Order Book	11	4	Integer	Order Book ID.

5.4.6 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, order book 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, order book and MPID from the original Add Order message.

Order Replace Message				
Name	Offset	Length	Value	Notes
Message Type	0	1	"U"	Order Replace Message.
Timestamp	1	8	Timestamp	Nanoseconds since midnight.
Tracking Number	9	2	Integer	Nasdaq Nordic internal tracking number
Original Order Reference Number	11	8	Integer	The 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 Nordic system will use this new order reference number for all subsequent updates.
Quantity	27	4	Integer	The new total displayed quantity.
Price	31	4	Price (4)	The new display price for the order.

5.5 Trade Messages

5.5.1 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 cross events, see section 5.5.2.)

Since no Add Order Message is generated when a non-displayed order is initially received, Nasdaq Nordic cannot use the Order Executed message 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 with Trade Type = "B" or "S" should be included in trade tickers as well as volume and other market statistics. Messages with Trade type = "S" should not be included in price statistics (Last,

High, Low, Average, VWAP, BBO), only in Turnover and market share statistics. Since Trade Messages do not affect the displayed book, however, they may be ignored by firms just looking to build and track the order book view.

Trade Message (Non-Cross)				
Name	Offset	Length	Value	Notes
Message Type	0	1	"P"	Trade Message Identifier
Timestamp	1	8	Timestamp	Nanoseconds since midnight.
Tracking Number	9	2	Integer	Nasdaq Nordic internal tracking number
Order Reference Number	11	8	Integer	The unique reference number assigned to the order on the book being executed.
Trade type	19	1	Alpha	Indicates where a non-displayed order has been executed. <ul style="list-style-type: none"> • "B" = Main book • "S" = Nordic@Mid
Quantity	20	4	Integer	The number of shares being matched in this execution.
Order Book	24	4	Integer	Order book ID.
Match Number	28	4	Integer	Assigned by Nasdaq Nordic to each match executed. Each match consists of one buy and one sell. The matching buy and sell executions share the same match number. The Match Number is referenced in the Trade Break Message.
Trade Price	32	4	Price (4)	The match price of the order.
Participant ID, buyer	36	4	Alpha-numeric	The MPID of the buyer, if public
Participant ID, seller	40	4	Alpha-numeric	The MPID of the seller, if public

5.5.2 Cross Trade Message

Cross Trade message indicates that Nasdaq Nordic has completed its cross process for a specific security. Nasdaq Nordic sends out a Cross Trade message for all active issues in the system following the Opening, Closing and any other 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 trade tickers or market statistic calculations.

Cross Trade Message				
Name	Offset	Length	Value	Notes
Message Type	0	1	"Q"	Cross Trade Message
Timestamp	1	8	Timestamp	Nanoseconds since midnight.
Tracking Number	9	2	Integer	Nasdaq Nordic internal tracking number
Quantity	11	4	Integer	The number of shares matched in the Cross.
Order Book	15	4	Integer	Order book ID.
Cross Price	19	4	Price (4)	The price at which the cross occurred.
Match Number	23	4	Integer	The generated day-unique Match Number of this execution.
Cross Type	27	1	Alpha	The cross session for which the message is being generated. <ul style="list-style-type: none"> • "O" = Opening Cross. • "I" = Scheduled Intraday Cross. • "C" = Closing Cross. • "H" = Cross for halted securities. • "A" = Auction On Demand
Number of Trades	28	4	Integer	

5.6 Broken Trade / Order Execution Message

The Broken Trade Message is sent whenever an execution on Nasdaq Nordic is broken. A trade break is final; once a trade is broken, it cannot be reinstated.

Firms that use the ITCH feed to create trade tickers 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.
Timestamp	1	8	Timestamp	Nanoseconds since midnight.
Tracking Number	9	2	Integer	Nasdaq Nordic internal tracking number
Match Number	11	4	Integer	The 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.

5.7 Net Order Imbalance Indicator (NOII)

NOII data is disseminated once for every order book when a cross auction period starts. After that, an update is sent each time an order book changes, in the minutes leading up to the uncross.

NOII Message				
Name	Offset	Length	Value	Notes
Message Type	0	1	"I"	NOII Message
Timestamp	1	8	Timestamp	Nanoseconds since midnight.
Tracking Number	9	2	Integer	Nasdaq Nordic internal tracking number
Paired Quantity	11	8	Integer	The total number of shares that are eligible to be matched at the Current Reference Price.
Imbalance Quantity	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. <ul style="list-style-type: none"> • "B" = buy imbalance • "S" = sell imbalance • "N" = no imbalance • "O" = Insufficient orders to calculate

NOII Message				
Name	Offset	Length	Value	Notes
Order Book	28	4	Integer	Order book ID.
Equilibrium Price	32	4	Price (4)	Equilibrium Price if the order book is crossed; otherwise set to zero (0).
Cross Type	36	1	Alpha	<p>The type of cross for which the NOII message is being generated</p> <ul style="list-style-type: none"> • "O" = Opening Cross • "C" = Closing Cross • "I" = Scheduled Intraday Cross • "H" = Cross for halted securities (including volatility interruptions)
Best Bid Price	37	4	Price (4)	Best Bid Price or zero (0) if the book is crossed.
Best Bid Quantity	41	8	Integer	Bid volume at top of book, or zero (0) if the book is crossed.
Best Ask Price	49	4	Price (4)	Best Ask Price or zero (0) if the book is crossed.
Best Ask Quantity	53	8	Integer	Ask volume at top of book, or zero (0) if the book is crossed.

5.8 Auction On Demand Order Imbalance Indicator (MOII)

MOII data is disseminated once for every order book when an auction on demand auction period starts. After that, an update is sent each time an order book changes until the uncross.

MOII Message				
Name	Offset	Length	Value	Notes
Message Type	0	1	"J"	MOII Message
Timestamp	1	8	Timestamp	Nanoseconds since midnight.
Tracking Number	9	2	Integer	Nasdaq Nordic internal tracking number
Paired Quantity	11	8	Integer	The total number of shares that are eligible to be matched at the Current Reference Price.
Order Book	19	4	Integer	Order book ID.
Equilibrium Price	23	4	Price (4)	Equilibrium Price if the order book is crossed; otherwise set to zero (0).
Cross Type	27	1	Alpha	The type of cross for which the MOII message is being generated <ul style="list-style-type: none"> • "A" = Auction On Demand
Cross Level	28	1	Alpha	The level the cross is being generated for: <ul style="list-style-type: none"> • "B" = BUY • "S" = SELL • "M" = MID • "L" = LIMIT

5.9 Execution Summary Message

The Execution Summary message disseminates summary information prior to the individual trades are disseminated. It is only applicable for instruments with INET Instrument Type Stock and only during continuous trading in central limit order book (lit book). It is not applicable for any other INET Instrument Types (Equity Right, Equity Warrant, Warrant, Index Fund Units or Unit trust certificates), Nordic@Mid book or any auction trades.

Execution Summary Message				
Name	Offset	Length	Value	Notes
Message Type	0	1	"K"	Execution Summary Message
Timestamp	1	8	Timestamp	Nanoseconds since midnight.
Tracking Number	9	2	Integer	Nasdaq Nordic internal tracking number
Order Book	11	4	Integer	Order book ID.
Aggressing Side	15	1	Alpha	The side of the incoming (aggressive) order that triggered this message <ul style="list-style-type: none"> • "B" = Buy • "S" = Sell • " " = None (only hidden quantity executed)
Quantity	16	4	Integer	Total quantity matched.
Hidden Quantity	20	4	Integer	Total hidden quantity matched. Zero (0) if no hidden quantity.
STP Cancel Quantity	24	4	Integer	Quantity deleted due to Self Trade Prevention (STP) Zero (0) if no quantity deleted due to STP
Far Price	28	4	Price	The highest price of the match in case of an aggressing buy order, or the lowest price in case of an aggressing sell order.
Add Quantity	32	4	Integer	The lit volume left of the aggressive order to be added to the book. Zero (0) if no volume is added.
Number Of Lit Executions	36	2	Integer	The total number of partial lit executions.

6 Support

Specification documents are located at:

<https://www.nasdaq.com/solutions/european-trading-services>

Appendix A - How to build an order book view

The information needed to build an order book view from the ITCH message flow is contained in the Add Order Messages (see section 0) and the Modify Order Messages (see section 5.4). The messages are:

- Add Order – No MPID Attribution
- Add Order – MPID Attribution
- Order Executed
- Order Executed with Price
- Order Cancel
- Order Replace
- Order Delete
- Order Book Flush

The two flavors of the Add Order messages have the same meaning; an order is added to the book. Orders shall be ranked by:

1. Price
2. Order Reference Number (an increasing number which can be interpreted as a timestamp in this regard).

The Order Executed (with Price) message signals a partial or full fill. The order quantity must be reduced by the quantity of the Order Executed message.

The Order Cancel message is a partial cancel, meaning that the order in question must be reduced in quantity by the quantity carried in this message. Note that the Order Cancel does not necessarily mean that the order is removed from the book.

The Order Delete message tells the recipient to remove the order referenced.

The Order Book Flush message tells the recipient to remove all orders from the referenced order book.

Appendix B - How to build a Trade Ticker

The Trade Ticker is based on the following messages:

- Order Executed
- Order Executed with Price
- Trade
- Cross Trade
- Broken Trade

Note that Trades marked as non-printable shall be excluded to avoid double booking of trades.