O*U*C*H for Nasdaq Nordic

Version 4.03.2
October 25, 2019

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Contents

1 Overview

Nasdaq Nordic[1] accepts limit orders from system participants and executes matching orders when possible. Non-matching orders may be added to the Nasdaq Nordic Limit Order Book, a database of available limit orders, where they wait to be matched according to the matching priority model.
OUCH is a simple protocol that allows Nasdaq Nordic participants to enter, replace and cancel orders and receive executions. It is intended to allow participants and their software developers to integrate Nasdaq Nordic into their proprietary trading systems or to build custom front ends.
OUCH only provides a method for participants to send orders to Nasdaq Nordic and receive updates on those orders entered. For information about all orders entered into and executed on the Nasdaq Nordic book, refer to the ITCH protocol (available separately).
OUCH is the low-level native protocol for connecting to Nasdaq Nordic. It is designed to offer the maximum possible performance at the cost of flexibility and ease of use. For applications that do not require this extreme level of performance, Nasdaq Nordic offers other, more standard interfaces that may be more suitable and easier to develop to.

1.1 Architecture

The OUCH protocol is composed of logical messages passed between the OUCH host and the client application.
All messages sent from the OUCH host to the client are assumed to be sequenced, and their delivery must be guaranteed by some lower level protocol. The SoupBinTCP (available separately) is typically used to guarantee the delivery and sequencing of OUCH messages sent from the host to the client.
Messages sent from the OUCH client to the host are inherently non-guaranteed, even if they are carried by a lower level protocol that guarantees delivery (like TCP/IP sockets). Therefore, all host-bound messages are designed so that they can be benignly resent for robust recovery from connection and application failures.
Each physical OUCH host port is bound to a Nasdaq Nordic-assigned logical OUCH Account. On a given day, every order entered on OUCH is uniquely identified by the combination of the logical OUCH Account and the participant-created Token field.

[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.

While most messages have a fixed message length, this is not the case for the Enter Order, Replace Order and their response message that support optional fields. Those messages have a number of required fields followed by a number of bit fields that are used to indicate what optional fields are included in the message. Last in the message, the optional fields are sent. Refer to section 4 for further information.
Nasdaq Nordic can add new message fields and message types to this specification. In general, new message fields will be added to the end of the message. Participants should use decoders that ignore unknown outbound (from Nasdaq Nordic) message types as well as outbound messages that expand with new fields added to the end of the message.

1.2 Data Types

Alpha and **alpha-numeric** fields are left-justified and padded on the right with spaces.

- **Token** fields are alphanumeric. All letters and numbers are allowed, as well as spaces. Tokens must be day unique per OUCH account. Tokens are case sensitive.

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

- **Price** fields are integers. When converted to a decimal format, prices are in fixed point format with 6 whole number places followed by 4 decimal digits.
  - The maximum price in OUCH 4.0 is 199,999.9900 (decimal, 7735939C hex).
  - When entering market orders for a cross, use the special price of 214,748.3647 (decimal, 7FFFFFFF hex).
- **Timestamp** fields are given in nanoseconds past midnight. Timestamps are always expressed in UTC (Universal Time Coordinated).
- **Expire Time** fields. Expire time specifies how many seconds a Good Til Time (GTT) order should live. This allows participants to control when an order expires. GTT orders are not retained after the market closes.

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

1.3 Fault Redundancy

A single OUCH Account can be bound to multiple physical OUCH machines. These OUCH machines then act as mirrors of each other for fault redundancy. In this configuration, both machines are able to accept orders and cancel requests, and any outbound messages would be simultaneously generated by both physical OUCH hosts.

1.4 Service Bureau Configuration

A single OUCH Account can accept orders from one or more firms, allowing a service bureau configuration. The service bureau OUCH Account must be specifically authorized to enter orders on behalf of each represented participant with a Nasdaq Nordic Service Bureau Agreement, available separately. Once an

agreement has been submitted, the OUCH Account set up as the service bureau may enter orders for the represented firm by putting the represented firm's Identifier (MPID) in the Firm field upon order entry.

2 Inbound Messages

Inbound messages are sent from the participant's application to the OUCH host. They are not sequenced. All Inbound Messages may be repeated benignly. This gives the client the ability to re-send any Inbound message if it is uncertain whether Nasdaq Nordic received it in the case of a connection loss or an application error.

The idea of benign inbound message retransmission with end-to-end acknowledgement is fundamental to Nasdaq Nordic's fail-over redundancy. If your connection ever fails, there is no way for you to know if pending messages actually made it over the link before the failure. A robust OUCH client can safely re-send any pending messages over a mirrored link without worrying about generating duplicates. This applies to Nasdaq Nordic's disaster fail over capability as well; if Nasdaq Nordic ever needs to fail over to the backup site, some messages sent at the moment of the failure may be lost. A robust application can simply re-send the pending messages, making the fail over seamless to the end user.

All inbound messages on an OUCH port are processed sequentially. This guarantees that if two orders are entered consecutively on the same connection, the first order entered will always be accepted first.

2.1 Enter Order Message

The Enter Order Message lets you enter a new order into Nasdaq Nordic.

Each new order must have a Token that is unique to the day and that logical OUCH account. If you send a valid order, you should receive an Accepted Order Message. If you send an Enter Order Message with a previously used Token, the new order will be ignored.

The display flag can be used for indicating that the submission is a MarketMaker Order (MMO). Unsolicited MMOs should have Display set to "W"; MMOs submitted in response to an MMO Refresh Request should set Display to "U". MMOs are required to have Capacity set to "3" (Market Maker).

Specific info for Cross Orders:

- In this context a cross order is an order that will only execute at the uncross ending an auction procedure.
- An order that participates in a Cross but enters the continuous market afterward if any portion of it is not executed is also considered a cross order. The difference in behavior is implied by the Time in Force field. Time in Force of 3 (immediate-or-cancel) will ensure that the order does not stay live beyond the Cross. Any other Time in Force is applied to the unexecuted portion of the order that enters the continuous market.

Minimum Quantity orders may be entered during the auctions; however, the minimum quantity feature will only be enforced during the continuous market.

Enter Order Message				
Name	**Offset**	**Len**	**Value**	**Notes**
Type	0	1	"O"	Identifies this message as an Enter Order.

Enter Order Message				
Name	**Offset**	**Len**	**Value**	**Notes**
Order Token	1	14	Token	As described above in Data Types. You can put any information you like. Token must be day-unique for each OUCH account.
Buy/Sell Indicator	15	1	Alpha	• "B" = buy order • "S" = sell order
Quantity	16	4	Integer	Total quantity entered. Must be greater than zero
Order Book	20	4	Integer	Order Book Id
Price	24	4	Price (4)	The limit price of the order. Please refer to the section in Data Types for more clarification.
Firm	28	4	Alpha-numeric	This field should contain all caps Firm Identifier for the order entry firm. One logical OUCH Account can potentially enter orders for multiple firms in a service bureau configuration. If this field is blank-filled, the default firm for the OUCH account will be used.
User	32	6	Alpha-numeric	Name of responsible trader (Trader ID)
Order Bit field 1	38	1	Bit-mask	Bit field indicating order fields to follow. Logical OR to include multiple fields. • 1 – Time in Force • 2 – Expire Time • 4 – Display • 8 – Capacity • 16 – Client Reference • 32 – Order Reference • 64 – Clearing Firm • 128 – Clearing Account
Order Bit field 2	39	1	Bit-mask	Bit field indicating order fields to follow. Logical OR to include multiple fields. • 1 - Minimum Quantity • 2 – Cross Type • 4 – STP Level • 8 – STP Action • 16 – STP Trader Group • 32 – Clearing Account Type • 64 – Client Identification

Enter Order Message				
Name	**Offset**	**Len**	**Value**	**Notes**
				• 128 – Investment decision within Firm
Order Bit field 3	40	1	Bit-mask	Bit field indicating order fields to follow. Logical OR to include multiple fields. • 1 - Execution within firm • 2 – Liquidity Provision Indicator • 4 – Algo Indicator • 8 – Peg Type • 16 – Party Role Qualifier • 32 – DEA Indicator • 64 – Trading at Closing Price • 128 – For future use
Order Bit field 4	41	1	Bit-mask	Bit field indicating order fields to follow. Logical OR to include multiple fields. • 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
Followed by optional fields, refer to section 4 for details.				

2.2 Replace Order Message

The Replace Order Message allows you to alter most of the attributes of an order in a single message. This is more efficient than canceling an existing order and immediately succeeding it with a new order. Replacing an order always gives it a new timestamp for its time priority on the book. If you wish to simply partially cancel an order and retain its time priority, send a Cancel Order Message instead. There are two Order Tokens in the Replace Order Message. The first must be filled out with the Order Token of the existing order; the second must be a new Order Token for the replacement. The replacement Order Token must be unique in the same way as Order Tokens are in the Enter Order Message, and replacement Order Tokens may not be the same as Tokens sent in Enter Order Messages. Any replacement Order Token that has already been used in another Enter Order Message or Replace Order Message will be ignored.

Nasdaq may respond to the Replace Order Message in several ways:

a) If the order for the existing Order Token is no longer live or if the replacement Order Token was already used, the replacement will be silently ignored.

b) If the order for the existing Order Token is live but the details of the replace fail validation (e.g.: new Shares exceed the maximum allowed quantity configured for the line), a Canceled Order Message will take the existing order out of the book. The replacement Order Token will not be consumed, and may be reused in this case.
c) If the order for the existing Order Token is live but the existing order cannot be canceled, there will be a Reject Message. This reject message denotes that no change has occurred to the existing order; the existing order remains fully intact with its original instructions. The Reject Message consumes the replacement Order Token, so the replacement Order Token may not be reused.
d) If the order for the existing Order Token is live and can be replaced, you will receive a Replaced Message.

Replace Order Messages may be chained together, so that a single order is replaced over and over again. There is no limit to the number of replaces.
The Shares on the replace denote the total number of shares liable for the whole chain. Here is an example:

- Enter Order Message for 500 shares
- Accepted Message for 500 shares
- Executed Message for 100 shares

At this point, you decide to replace the order. If you want to be exposed for

a) the remaining 400 shares, send the Replace Order Message with 500 Shares. This 500 equals the 400 exposed plus the 100 previously executed.
b) a new 500 shares, send the Replace Order Message with 600 Shares. This 600 equals the 500 new shares plus the 100 previously executed.

This may seem a bit confusing at first, but it inhibits the risk of double-liability throughout the order/replace chain.

Replace Order Message				
Name	**Offset**	**Len**	**Value**	**Notes**
Type	0	1	“U”	Identifies this message as a replace order.
Existing Order Token	1	14	Token	This must be filled out with the exact Order Token sent on the Enter Order Message or last Replace Order Message.
Order Token	15	14	Token	As described above in Data Types. You can put any information you like. Token must be day-unique for each OUCH account.
Quantity	29	4	Integer	Total number of shares liable, inclusive of previous executions and Self Match Prevention decremented shares on this order chain. Must be greater than zero
Price	33	4	Price (4)	The price of the replacement order. Please refer to the section in Data

Replace Order Message				
Name	**Offset**	**Len**	**Value**	**Notes**
				Types for more clarification.
User	37	6	Alpha-numeric	Name of responsible trader (Trader ID)
Order Bit field 1	43	1	Bit-mask	Bit field indicating order fields to follow. Logical OR to include multiple fields. • 1 – Time in Force • 2 – Expire Time • 4 – Display • 8 – Client Reference • 16 – Order Reference • 32 – Clearing Firm • 64 – Clearing Account • 128 – Minimum Quantity
Order Bit field 2	44	1	Bit-mask	Bit field indicating order fields to follow. Logical OR to include multiple fields. • 1 - Cross Type • 2 – Clearing Account Type • 4 – For future use • 8 – For future use • 16 – For future use • 32 – For future use • 64 – For future use • 128 – For future use
Order Bit field 3	45	1	Bit-mask	Bit field indicating order fields to follow. Logical OR to include multiple fields. • 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
Order Bit field 4	46	1	Bit-mask	Bit field indicating order fields to follow. Logical OR to include multiple fields. • 1 - For future use • 2 – For future use • 4 – For future use • 8 – For future use

Replace Order Message				
Name	**Offset**	**Len**	**Value**	**Notes**
				• 16 – For future use • 32 – For future use • 64 – For future use • 128 – For future use
Followed by optional fields, refer to section 4 for details.				

Optional fields not sent in the replacement message retain their values from the previous state of the order.

2.3 Cancel Order Message

The Cancel Order Message is used to request that an order be canceled or reduced. In the Cancel Order Message, you must specify the new "intended order size" for the order. The "intended order size" is the maximum quantity that can be executed in total after the cancel is applied.
To cancel the entire balance of an order, you would enter a Cancel Order Message with a Quantity field of zero.

Cancel Order Message				
Name	**Offset**	**Len**	**Value**	**Notes**
Type	0	1	"X"	Cancel Order Message
Order Token	1	14	Token	This must be filled out with the exact Order Token sent on the Enter Order Message or last Replace Order Message.
Quantity	15	4	Integer	This is the new intended order size. This limits the maximum quantity that can potentially be executed in total after the cancel is applied. Entering a zero here will cancel any remaining open quantity on this order.
User	19	6	Alpha-numeric	Name of responsible trader (Trader ID)

Note that the only acknowledgement to a Cancel Order Message is the resulting Canceled Order Message. There is no "too late to cancel" message since by the time you received it, you would already have gotten the execution. Superfluous Cancel Order Messages are silently ignored.

3 Outbound Sequenced Messages

Outbound messages are generated by the OUCH host port and received by your client application.

3.1 System Event Messages

System Event Messages signal events that affect the entire Nasdaq Nordic system:

System Event Message				
Name	**Offset**	**Len**	**Value**	**Notes**
Message Type	0	1	"S"	System Event Message identifier
Timestamp	1	8	Timestamp	See Data Types above.
Event Code	9	1	Alpha	• "S" - Start of Day • "E" – End of Day

System Event Codes		
Code	**Name**	**Comments**
"S"	Start of Day	This is always the first message each day. It indicates that Nasdaq Nordic is open and ready to start accepting orders.
"E"	End of Day	This indicates that Nasdaq Nordic is now closed and will not accept any new orders in this session. There will be no further executions during this session; however, it is still possible to receive Broken Trade Messages and Canceled Order Messages

3.2 Order Messages

Order messages inform you about each event in the lifetime of your orders.

3.2.1 Order Accepted Message

This message acknowledges the receipt and acceptance of a valid Enter Order Message. The data fields from the Enter Order Message are echoed back in the Order Accepted Message. Note that the accepted values may differ from the entered values for some fields. You will always receive an Accepted Order Message for an order before you get any Canceled Order Messages or Executed Order Messages for the order.

Order Accepted Message				
Name	**Offset**	**Len**	**Value**	**Notes**
Message Type	0	1	"A"	Accept Order Message Identifier
Timestamp	1	8	Timestamp	Timestamp
Order Token	9	14	Token	The order Token field as entered
Price	23	4	Price	The accepted limit price of the order. Please note that the accepted price could potentially be different than the entered price if the order was re-priced by Nasdaq Nordic on entry. The accepted price will always be better than or equal to the entered.
Order Reference Number	27	8	Integer	The day-unique Order Reference Number assigned by Nasdaq Nordic to this order
Order Bit field 1	35	1	Bit-mask	Bit field indicating order fields to follow. Logical OR to include multiple fields. • 1 – Buy/Sell Indicator • 2 – Quantity • 4 – Order Book • 8 – Time in Force • 16 – Expire Time • 32 – Firm • 64 – Display • 128 – Capacity
Order Bit field 2	36	1	Bit-mask	Bit field indicating order fields to follow. Logical OR to include multiple fields. • 1 - User • 2 – Client Reference • 4 – Order Reference • 8 – Clearing Firm

Order Accepted Message				
Name	**Offset**	**Len**	**Value**	**Notes**
				• 16 – Clearing Account • 32 – Minimum Quantity • 64 – Cross Type • 128 – STP Level
Order Bit field 3	37	1	Bit-mask	Bit field indicating order fields to follow. Logical OR to include multiple fields. • 1 - STP Action • 2 – STP Trader Group • 4 – Clearing Account Type • 8 – Client Identification • 16 – Investment decision within Firm • 32 – Execution within firm • 64 – Liquidity Provision Indicator • 128 – Algo Indicator
Order Bit field 4	38	1	Bit-mask	Bit field indicating order fields to follow. Logical OR to include multiple fields. • 1 – DEA Indicator • 2 – Peg Type • 4 – Party Role Qualifier • 8 – Trading at Closing Price • 16 – For future use • 32 – For future use • 64 – For future use • 128 – For future use
Followed by optional fields, refer to section 4 for details.				

3.2.2 Order Replaced Message

This message acknowledges the receipt and acceptance of a valid Replace Order Message. The data fields from the Replace Order Message are echoed back in this message. Note that the accepted values may differ from the entered values for some fields.

The Shares field on the replace indicates how many shares were left exposed when the replacement completed. E.g.:

- Enter Order Message for 500 shares
- Accepted Message for 500 shares
- Executed Messages for 100 shares
- Replace Order Message for 500 shares
- Replaced Messages with 400 shares

The 400 shares in the Replace Message indicate that 400 shares exist on the book. This same scenario could happen if the execution was in flight back to you while the Replace Order Message was traveling to Nasdaq Nordic as follows:

- Enter Order Message for 500 shares
- Accepted Message for 500 shares
- Replace Order Message for 500 shares
- Executed Messages for 100 shares on original order
- Replaced Messages with 400 shares

Order Replaced Message				
Name	**Offset**	**Len**	**Value**	**Notes**
Message Type	0	1	"U"	Replaced Order Message Identifier
Timestamp	1	8	Timestamp	Timestamp
Old Order Token	9	14	Token	The old order Token field
Order Token	23	14	Token	The order Token field as entered
Price	37	4	Price	The accepted price of the replacement. Please note that the accepted price could potentially be different than the entered price if the order was re-priced by Nasdaq Nordic on entry. The accepted price will always be better than or equal to the entered.
Order Reference Number	41	8	Integer	The day-unique Order Reference Number assigned by Nasdaq Nordic to this order
Order Bit field 1	49	1	Bit-mask	Bit field indicating order fields to follow. Logical OR to include multiple fields. • 1 – Buy/Sell Indicator • 2 – Quantity • 4 – Order Book • 8 – Time in Force • 16 – Expire Time • 32 – Firm • 64 – Display • 128 – User
Order Bit field 2	50	1	Bit-mask	Bit field indicating order fields to follow. Logical OR to include multiple fields. • 1 - Client Reference • 2 – Order Reference • 4 – Clearing Firm • 8 – Clearing Account • 16 – Minimum Quantity • 32 – Cross Type

Order Replaced Message				
Name	**Offset**	**Len**	**Value**	**Notes**
				• 64 – Clearing Account Type • 128 – For future use
Order Bit field 3	51	1	Bit-mask	Bit field indicating order fields to follow. Logical OR to include multiple fields. • 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
Order Bit field 4	52	1	Bit-mask	Bit field indicating order fields to follow. Logical OR to include multiple fields. • 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
Followed by optional fields, refer to section 4 for details.				

3.2.3 Canceled Order Message

A Canceled Order Message informs you that an order has been reduced or canceled. This could be acknowledging a Cancel Order Message, or it could be the result of the order timing out or being canceled automatically.
Please note that a Cancel Order Message does not necessarily mean the entire order is dead; some portion of the order may still be alive.

Canceled Order Message				
Name	**Offset**	**Len**	**Value**	**Notes**
Message Type	0	1	"C"	Canceled Order Message
Timestamp	1	8	Timestamp	Timestamp
Order Token	9	14	Token	The Order Token of the order being reduced
Decrement Quantity	23	4	Integer	The quantity just decremented from the order. This number is incremental, not cumulative.
Reason	27	1	Alpha	Reason the order was reduced or canceled. See currently supported Cancel Order Reasons below. Clients should anticipate additions to this list and thus support all capital letters of the English alphabet. • "U" - User requested cancel • "I" - Immediate or Cancel order • "T" – Timeout • "S" – Supervisory • "D" – Regulatory • "Q" - Self-Match Prevention

Cancel Order Reasons		
Reason	**Name**	**Comments**
"U"	User requested cancel	Sent in response to a Cancel Order Message
"I"	Immediate or Cancel order	This order was originally sent with a timeout of zero and no further matches were available on the book so the remaining unexecuted quantity was immediately cancelled.
"T"	Timeout	The Time In Force for this order has expired.
"S"	Supervisory	This order was manually cancelled or reduced by a Nasdaq Nordic supervisory terminal. This is usually in response to a participant request via telephone.
"D"	Regulatory	This order cannot be executed

Cancel Order Reasons		
Reason	**Name**	**Comments**
		because of a regulatory restriction (e.g., short sale or trade through restrictions).
"Q"	Self-Match Prevention	The order was cancelled because it would have executed with an order entered by the same user.

3.2.4 Cancel Pending

A Cancel Pending Message is sent in response to a cancel request signifying that it cannot be immediately applied. Any unexecuted portion of the order will automatically be canceled as soon as possible.
While a cancel or replace is pending, any following cancel request for the same order will be ignored by OUCH.

Cancel Pending Message				
Name	**Offset**	**Len**	**Value**	**Notes**
Message Type	0	1	"P"	Cancel Pending Message
Timestamp	1	8	Timestamp	Timestamp
Order Token	9	14	Token	Order Token for the order that has its cancel pended
Reason	23	1	Alpha	Reason the order was pended. Clients should anticipate additions to this list and thus support all capital letters of the English alphabet. A – Cancel pending completion of Auction of Demand (AOD)

3.2.5 Replace Pending

A Replace Pending Message is sent in response to a replace request signifying that it cannot be immediately applied. The active order will automatically be replaced as soon as possible.
While a cancel or replace is pending, any following replace request for the same order will be ignored by OUCH.

Replace Pending Message				
Name	**Offset**	**Len**	**Value**	**Notes**
Message Type	0	1	"N"	Replace Pending Message
Timestamp	1	8	Timestamp	Timestamp
Old Order Token	9	14	Token	Order Token for the being replaced
Order Token	23	14	Token	Order Token for the order that has its replace pended
Reason	37	1	Alpha	Reason the order was pended. Clients should anticipate additions to this list and thus support all capital

Replace Pending Message				
Name	**Offset**	**Len**	**Value**	**Notes**
				letters of the English alphabet. A – Cancel pending completion of Auction of Demand (AOD)

3.2.6 Executed Order Message

An Executed Order Message informs you that all or part of an order has been executed.

Executed Order Message				
Name	**Offset**	**Len**	**Value**	**Notes**
Message Type	0	1	"E"	Order Executed Message
Timestamp	1	8	Timestamp	Execution time
Order Token	9	14	Token	The Order Token of the executing order
Executed Quantity	23	4	Integer	Incremental quantity executed
Execution Price	27	4	Price	The price at which these shares were executed.
Liquidity Flag	31	1	Alpha	• "A" – Continuous market trade • "C" – Auction trade • "P" – Auction On Demand (AOD) trade • "G" – Trading at Close Price
Match Number	32	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. Unique over order books per trading day.
Contra Firm	36	4	Alpha	The MPID of the counterparty.
Trading Mode	40	1	Alpha	MMT Level 2 • "O" – Scheduled Opening Auction • "K" – Scheduled Closing Auction • "I" – Scheduled Intraday Auction • "U" – Unscheduled Auction • "2" – Continuous Trading
Transaction Category	41	1	Alpha	MMT Level 3.1 • "D" – Dark Trade • "-" – None apply

Executed Order Message						
Name	**Offset**	**Len**	**Value**		**Notes**	
Transaction Type: Algo Indicator	42	1	Alpha		MMT Level 3.9 • "H" – Algorithmic Trade • "-" – No Algorithmic Trade	
Liquidity Attributes	43	1	Bit-field	1-3	Reserved	
				4-5	Liquidity Indicator	00: Added Liquidity 01: Removed Liquidity 10: Auction 11: Reserved
				6	Liquidity Internalized	0: Not Internalized 1: Internalized
				7	Liquidity Top Of Book	0: Not Top-of-Book 1: Top-of-Book
				8	Liquidity Self Trade	0: Non Self-Trade 1: Self-Trade (no clear, no publish)

3.2.7 Broken Trade Message

A Broken Trade Message informs you that an execution has been broken. The trade is no longer good and will not clear. The reason for the break is given.
You will always get an Executed Order Message prior to getting a Broken Trade Message for a given order/execution.

Broken Trade Message				
Name	**Offset**	**Len**	**Value**	**Notes**
Message Type	0	1	"B"	Broken Trade Message
Timestamp	1	8	Timestamp	Timestamp
Order Token	9	14	Token	The Order Token of the order for which the given Match Number is being broken.
Match Number	23	4	Integer	Match Number as transmitted in the Executed Order Message being broken.
Reason	27	1	Alpha	The reason the trade was broken. See currently supported Broken Trade Reasons table below. Clients should anticipate additions to this list and thus support all capital letters of the English alphabet. • "E" – Erroneous. The trade was deemed clearly erroneous. • "C" – Consent. The two parties mutually agreed to break the trade.

Broken Trade Message				
Name	**Offset**	**Len**	**Value**	**Notes**
				• "S" – Supervisory. The trade was manually broken by a Nasdaq Nordic supervisory terminal. • "X" – External. The trade was broken by an external third party.
Trading Mode	28	1	Alpha	MMT Level 2 • "O" – Scheduled Opening Auction • "K" – Scheduled Closing Auction • "I" – Scheduled Intraday Auction • "U" – Unscheduled Auction • "2" – Continuous Trading
Transaction Category	29	1	Alpha	MMT Level 3.1 • "D" – Dark Trade • "-" – None apply
Transaction Type: Algo Indicator	30	1	Alpha	MMT Level 3.9 • "H" – Algorithmic Trade • "-" – No Algorithmic Trade

3.2.8 Rejected Order Message

A Rejected Order Message may be sent in response to an Enter Order or Replace Order Message if the order cannot be accepted at this time. The reason for the rejection is given.

The Token of a rejected order cannot be re-used.

Rejected Order Message				
Name	**Offset**	**Len**	**Value**	**Notes**
Message Type	0	1	"J"	Rejected Order Message
Timestamp	1	8	Timestamp	Timestamp
Order Token	9	14	Token	Order Token field as was entered.
Reason	23	1	Alpha	The reason the order was rejected. See currently supported reject reasons below. Clients should anticipate additions to this list.

Rejected Order Reasons	
Reason	**Explanation**
"T"	Test Mode — This OUCH Account is configured for test mode and is not able to accept orders in non-TEST securities.
"H"	Halted — There is currently a trading halt so no orders can be accepted in this stock at this time.
"Z"	Quantity exceeds configured safety threshold — The quantity entered must be less than the safety threshold configured for this Account. The safety threshold can be added/updated through

Rejected Order Reasons	
Reason	**Explanation**
	Nasdaq Nordic Member Services.
“S”	Invalid order book identity — The order book identity field must be a valid issue, tradable on Nasdaq Nordic.
“D”	Invalid Display Type — Sent when Display Type Entered cannot be accepted in current circumstances and can’t be simply converted to a valid Display Type.
“C”	Nasdaq Nordic is closed.
“L”	Firm Not Authorized.
“M”	Outside of permitted times for requested clearing type
“R”	This order is not allowed in this type of cross (stock or time restrictions).
“X”	Invalid price
“N”	Invalid Minimum Quantity
“U”	Invalid User ID
“4”	Invalid Data
“O”	Unspecified Error
“I”	Invalid Side
“K”	Invalid Short Code
“P”	Outside of price collar
“Q”	Exceeds maximum order quantity
“V”	Exceeds maximum order value
”Y”	Invalid Trading At Close

Pre-Trade Risk Management (PRM) Reasons	
Reason	**Explanation**
a	PRM – Order Entry Disabled
b	PRM – Invalid Symbol
c	PRM – Restricted Symbol
d	PRM – Fails Price Check
e	PRM – Market orders not allowed
f	PRM – Surpasses Max Order Share Threshold
g	PRM – Surpasses Max Order Value Threshold
h	PRM – Surpasses Notional Value Threshold (future use)
i	PRM – Over Total Risk Value
j	PRM – Over Daily Trade One-Sided Value
k	PRM – Over Daily Trade Total Value
l	PRM – Over Daily Open Order One-Sided Value
m	PRM – Over Daily Open Order Total Value
n	PRM - Market price order moves auction price too far

3.2.9 MMO Refresh Request Message

An MMO Refresh Request Message is sent to request that a previously submitted MMO be refreshed. The message will be delivered only to firms enabled for MMO entry.

MMO Refresh Request Message				
Name	**Offset**	**Len**	**Value**	**Notes**
Message Type	0	1	"W"	MMO Refresh Request Message
Timestamp	1	8	Timestamp	Timestamp
Firm	9	4	Alpha	Firm to whom the request is directed
Order Book	13	4	Integer	Order Book to be refreshed
Reason	17	1	Alpha	Protection triggered for: • "P" = Passive MMO • "A" = Aggressive MMO

4 Optional fields

4.1 Inbound Messages

Optional fields, including fields with default values, are supported for the following inbound messages:

- Enter Order
- Replace Order

The fields in the below table can optionally be passed in those messages. The respective bits in the bit fields must be set to 1 for any fields sent.
The fields of the first bit field must immediately follow the required fields, lowest order bit first. Fields indicated by the following bit fields follow as per the same pattern. Bits that are reserved for future use must be set to 0.
Incoming messages will be rejected if they have any bits set that are not represented by the related field sent or if the bit is for future use.
Note that field default values apply only to Enter Order messages. Replace messages must pass values for any field that is changed.

Name	Len	Value	Notes
Time in Force	1	Alpha-numeric	• 0 = Day (default) • 3 = IOC (Immediate or cancel) • 6 = GTT (time is specified in the Expire Time field) • B = GFA (Good For Auction). Valid for Auction on Demand.
Expire Time	2	Integer	The number of seconds that this order should live before being automatically canceled.
Display	1	Alpha	• “Y” = Display (default) • “N” = Non-Display • “I” = Imbalance Only • “W” = MarketMaker Order • “U” = MarketMaker Order Refresh • “P” = Top-of-Book • “A” = Auction On Demand
Capacity	1	Alpha-numeric	• 1 = Client (default) – maps to ‘AOTC’ • 2 = Own account – maps to ‘DEAL’ • 3 = Market maker – maps to ‘DEAL’ • 4 = Issuer holding – maps to ‘AOTC’ • 6 = Issue price stabilizing – maps to ‘AOTC’ • 7 = Riskless Principal – maps to ‘MTCH’ • 8 = Issuer holding – maps to ‘DEAL’ • 9 = Issue price stabilizing – maps to ‘DEAL’
Client Reference	15	Alpha	User supplied client reference. Pass through field to be returned unchanged on outgoing order and trade messages. The intended use of

Name	Len	Value	Notes
			the client reference is for back office related information.
Order Reference	10	Alpha	User supplied order reference. Pass through field to be returned unchanged on outgoing order and trade messages. The intended use of the order reference is for front office related information.
Clearing Firm	4	Alpha	User supplied Clearing Firm. Pass-through field. (Note that the field is not forwarded to the CCP).
Clearing Account	12	Alpha	Supplemental accounting information that is forwarded to the CCP. Field will only be used by the CCP if there is a bilateral agreement in place.
Minimum Quantity	4	Integer	Minimum quantity that could be traded. Allowed to be non-zero only on non-displayed orders (eg., hidden or IOC orders)
Cross Type	1	Alpha	• "D" = not specified (default) • "C" = closing cross • "O" = opening cross • "I" = scheduled intraday cross • "H" = Halt cross • "A" = Auction on Demand
STP Level	1	Alpha-numeric	Defines that the order is eligible for self-trade prevention and the scope of prevention. • 1 = MPID + Trader • 2 = MPID • 3 = Specified Trader Group (requires STP Trader Group to be specified)
STP Action	1	Alpha-numeric	The parameter is ignored if the STP Level is not specified. • 1 = Cancel passive order (default) • 2 = Cancel aggressive order • 3 = Cancel both orders • 4 = Create a transfer transaction
STP Trader Group	2	Alpha-numeric	Defines the trader group. Client defined values. Conditionally required for STP Level = 3, otherwise ignored.
Clearing Account Type	1	Alpha-numeric	Designates the account type to be used for the order when submitted to clearing. • 1 = Customer (Client) - default • 2 = Firm (House)
Client Identification	4	Integer	The short code representing the client behind the order. Data corresponding to this short code must have been previously supplied, or will be supplied by the end of the calendar day, per our Rules

Name	Len	Value		Notes	
				For clients, the following values are reserved for applicable use: 0 = NONE (No client for this order) – (default) 1 = AGGR (An aggregation of multiple client orders) 2 = PNAL (Clients are pending allocation)	
Investment decision within Firm	4	Integer		The short code representing the investment decision maker of the order. Data corresponding to this short code must have been previously supplied, or will be supplied by the end of the calendar day, per our Rules.	
Execution within firm	4	Integer		The short code representing the execution decision maker of the order. Data corresponding to this short code must have been previously supplied, or will be supplied by the end of the calendar day, per our Rules. For execution decision makers, the following value is reserved for applicable use: 3 = NORE (Time and venue of the order instructed by the client of the Participant or by another person from outside the Investment Firm.)	
Liquidity Provision Indicator	1	Alpha		This flag is used to indicate whether the order is related to any sort of liquidity provision activity, as defined under MiFID II. At a future date, provision of this flag will be required for the order to be considered to count towards meeting obligation pursuant to the Nasdaq Liquidity Provider. • "N" = No liquidity Provision – (default) • "Y" = Liquidity Provision	
Algo Indicator	1	Alpha		Indicates that the order was placed as a result of an investment firm engaging in algorithmic trading. • "-" = No algo – (default) • "H" = Algo	
Peg Type	1	Alpha		• "N" = None – (default) • "P" = Market • "R" = Primary • "M" = Midpoint	
Party Role Qualifier	1	Bit-field	0-1	Client Identification	00: None 01: LEI/Firm 11: Natural Person
			2-3	Investment Decision within Firm	00: None 10: Algo

Name	Len	Value		Notes	
					11: Natural Person
			4-5	Execution decision within Firm	00: None 10: Algo 11: Natural Person
			6-7	Reserved	
DEA Indicator	1	Alpha		Identifies the origin of the order. Used to indicate whether DEA activity (as defined under MiFID II) is involved in the order. Will use configured default if not provided. • 1 = Order received from a customer • 2 = Order received from within the firm • 3 = Order received from another broker-dealer • 4 = Order received from a customer or originated with the firm • 5 = Order received from a direct access or sponsored access customer	
Trading at Closing price	1	Alpha		Indicates if the order should participate in trading at closing price. • "Y" = Participate in Trading at Closing Price • "N" = Do Not participate in Trading at Closing Price If not included, pre-defined configuration will be used.	

4.2 Outbound Messages

Optional fields, including fields with default values, are supported for the following outbound messages:

- Order Accepted
- Order Replaced

The fields in the below table can optionally be passed in those messages. The respective bits in the bit fields are set to 1 for any fields sent.
The fields of the first bit field will immediately follow the required fields, lowest order bit first. Fields indicated by the following bit fields follow as per the same pattern. Bits that are reserved for future use are set to 0.
Client configuration determines whether optional outbound fields are sent. Fields without values, or enumerated fields with the default value, are never sent.

Name	Len	Value	Notes
Buy/Sell Indicator	1	Alpha	Buy/sell indicator as entered
Quantity	4	Integer	Total quantity accepted
Order Book	4	Integer	Order Book Identity as entered

Name	Len	Value	Notes
Time in Force	1	Alpha-numeric	The accepted Time in Force of the order. Please note that the accepted Time in Force may potentially be different than the entered Time in Force. The accepted Time in Force will always be equal to or shorter in scope than the entered Time in Force. • 0 = Day (default) • 3 = IOC (Immediate or cancel) • 6 = GTT (time is specified in the Expire Time field) • B = GFA (Good for Auction)
Expire Time	2	Integer	Expire time in seconds. Please note that the accepted Time in Force may potentially be different than the entered Time in Force. The accepted Expire Time will always be equal to or shorter in scope than the entered Time in Force.
Firm	4	Alpha	The accepted firm for the order. Please note that if the firm was left blank on entry, the default firm for the OUCH account will appear here.
Display	1	Alpha	The accepted display type for the order. • “Y” = Display (default) • “N” = Non-Display • “I” = Imbalance Only • “W” = MarketMaker Order • “U” = MarketMaker Order Refresh • “P” = Top-of-Book • “A” = Auction On Demand
Capacity	1	Alpha-numeric	The capacity specified on the order • 1 = Client (default) – maps to ‘AOTC’ • 2 = Own account – maps to ‘DEAL’ • 3 = Market maker – maps to ‘DEAL’ • 4 = Issuer holding – maps to ‘AOTC’ • 6 = Issue price stabilizing – maps to ‘AOTC’ • 7 = Riskless Principal – maps to ‘MTCH’ • 8 = Issuer holding – maps to ‘DEAL’ • 9 = Issue price stabilizing – maps to ‘DEAL’
User	6	Alpha-numeric	Name of responsible trader (Trader ID) as entered on order.
Client Reference	15	Alpha	User supplied client reference as entered on order.
Order Reference	10	Alpha	User supplied order reference as entered on order.
Clearing Firm	4	Alpha	As per the order.
Clearing	12	Alpha	As per the order.

Name	Len	Value	Notes
Account			
Minimum Quantity	4	Integer	Minimum quantity that could be traded.
Cross Type	1	Alpha	The Cross Type as entered. Only supplied when Enter Order was a Cross Order. • "D" = not specified (default, not included in message) • "C" = closing cross • "O" = opening cross • "I" = scheduled intraday cross • "H" = Halt cross • "A" = Auction on Demand
STP Level	1	Alpha-numeric	As per the order.
STP Action	1	Alpha-numeric	As per the order.
STP Trader Group	2	Alpha-numeric	As per the order.
Clearing Account Type	1	Alpha-numeric	As per the order.
Client Identification	4	Integer	The short code representing the client behind the order. Data corresponding to this short code must have been previously supplied, or will be supplied by the end of the calendar day, per our Rules. For clients, the following values are reserved for applicable use: 0 = NONE (No client for this order) – (default) 1 = AGGR (An aggregation of multiple client orders) 2 = PNAL (Clients are pending allocation)
Investment decision within Firm	4	Integer	The short code representing the investment decision maker of the order. Data corresponding to this short code must have been previously supplied, or will be supplied by the end of the calendar day, per our Rules.
Execution within firm	4	Integer	The short code representing the execution decision maker of the order. Data corresponding to this short code must have been previously supplied, or will be supplied by the end of the calendar day, per our Rules. For execution decision makers, the following value is reserved for applicable use: 3 = NORE (Time and venue of the order instructed by the client of the Participant or by

Name	Len	Value	Notes
			another person from outside the Investment Firm.)
Liquidity Provision Indicator	1	Alpha	This flag is used to indicate whether the order is related to any sort of liquidity provision activity, as defined under MiFID II. At a future date, provision of this flag will be required for the order to be considered to count towards meeting obligation pursuant to the Nasdaq Liquidity Provider. • "N" = No liquidity Provision – (default) • "Y" = Liquidity Provision
Algo Indicator	1	Alpha	Indicates that the order was placed as a result of an investment firm engaging in algorithmic trading. • "-" = No algo – (default) • "H" = Algo
DEA Indicator	1	Alpha	As per the order. Will not be populated if the default is non-DEA and the value is not provided on the inbound message.
Peg Type	1	Alpha	• "N" = None – (default) • "P" = Market • "R" = Primary • "M" = Midpoint
Party Role Qualifier	1	Bit-field	As per the order.
Trading at Closing price	1	Alpha	Indicates if the order should participate in trading at closing price. • "Y" = Participate in Trading at Closing Price • "N" = Do Not participate in Trading at Closing Price (default)

5 Support

Specification documents are located at:
http://business.nasdaq.com/trade/trade-management/technical-information/index.html

6 Revision History

Date	Revision	Change Description
June 8, 2015	4.0	• Integer fields have binary representation. • Timestamps supports nanosecond granularity and are UTC-based. • Optional fields support in Enter Order, Replace Order and their respective acknowledgement messages. This includes fields with default values. Mandatory bit-mask fields define what fields are included in the message sent. • Added default values for the following Enter Order fields: o Time in Force, default = Day o Capacity, default = Client • Client configuration determines whether to include optional fields in outbound messages or not. Fields are only included if they have a value. • Time in Force is specified as a FIX compatible enumeration. To support GTT, a new field (Expire Time) provides the number of seconds till expiry. • The Cancel Pending and Cancel Reject messages are retired as they are not (and have not been) produced. • The Reason field is removed from the Order Replaced message as Nasdaq Nordic does not do replaces. • The “Q” enum is removed from the Enter Order message Type field. • The “R” enum is removed from the Order Accepted message Type field. • New optional field, Clearing Account Type, in the Enter Order, Replace Order, Order Accepted and Order Replaced messages.
June 8, 2015	4.0	Added text to section 4.1: field defaults apply only for Enter Order messages.
June 8, 2015	4.0	Added enum “D” to the Cross Type field of the Enter and Replace Order messages and their respective ack messages. Changed the data type to Alpha-numeric for the Clearing Account Type field. Section 4.2. Added that enumerated Fields with

		default values are not sent.
June 9, 2015	4.00.1	Modified the Order Reference Number field length to eight bytes in all messages (sections 3.2.1 and 3.2.2)
June 22, 2015	4.00.2	Removed Liquidity Flag = “E” as it was not used.
June 25, 2015	4.00.3	Changed the data type for the Time in Force and Capacity fields from integer to Alpha-numeric (section 4.1 and 4.2)
June 26, 2015	4.00.4	Added reject Reason “n” to table of PRM reject Reason codes in section 3.2.8
August 21, 2015	4.00.5	Corrected second bullet in section 2.1. Time in force for IOC = 3 (not 0).
December 1, 2015	4.00.6	Brand name changes, no actual protocol changes.
November 8, 2016	4.00.7	Added MiFID II fields: Client Identification, Investment decision within Firm, Execution within firm, Liquidity Provision Indicator, Algo Indicator
December 12, 2016	4.00.8	Added DEA Indicator (sections 3.2.1 and 4.2). Corrected Algo enum value (H) in the Algo Indicator field in section 4.2
February 22, 2017	4.01	Added Auction On Demand and Pending Cancel/Replace messages.
June 22, 2017	4.01.1	Added 3 = CLIENT to the Execution within firm field. Added mapping of MiFID II (RTS 24) Trading Capacity values to the Capacity field. New reject codes added.
June 22, 2017	4.02	DEA Indicator updated. Added Party Role Qualifier.
June 26, 2017	4.02.1	Capacity mapping corrected for Market Maker and Riskless Principal
July 13, 2017	4.02.2	Corrected the order of fields Party Role Qualifier and DEA Indicator in section 4.1
October 24, 2017	4.02.3	Updated Execution Within Firm description for value “3” in section 4.1 and 4.2 Updated the User field to include Trader ID in sections 2.1, 2.2, 2.3 and 4.2
May 22, 2018	4.02.4	Added two new values to the Capacity field
September 19, 2018	4.02.5	Added B (Good for Auction) to Time in Force Added A (Auction on Demand) to Cross Type Clarified the Order Token description in the Cancel Order Message
January 16, 2019	4.03	Revised LiquidityFlag (in section 3.2.6) Removed following enums: • R = Removed Liquidity

		• X = Internalized during the continuous market • W = Added Liquidity, Top-of-Book • S = Self-Trade, added liquidity • T = Self-Trade removed liquidity • Y = Internalized during one of the auctions • Q = Auction On Demand (AOD) trade, internalized Changed enum text: • A - from Added liquidity to Continuous market trade • C - from Executed in one of the auctions to Auction Trade Added Liquidity Attributes Updated offset in Cancelled Order Message
April 9, 2019	4.03.1	New value in Order Bit field 3: 64 –Trading at Closing Price (in section 2.1) New value in Order Bit field 4: 8 –Trading at Closing Price (in section 3.2.1) New value in Liguidity Flag: “G” = Trading at Closing Price (in section 3.2.6) Added new field: Trading at Closing Price in sections 4.1 and 4.2
October 25, 2019	4.03.2	Add new Order Rejected Reason table in 3.2.8 - Y - Invalid Trading At Close