



Ouch to Trade Options (OTTO) Specifications

VERSION 1.4d

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O*T*T*O

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1 Overview

NASDAQ accepts limit orders from system subscribers and executes matching orders when possible. Non-matching orders may be added to NASDAQ's Order Book, a database of available limit orders, where they wait to be matched in price-time priority. All NASDAQ subscribers are anonymous, no subscriber's identity is disclosed before, during, or after an execution.

OTTO is a simple protocol that allows NASDAQ Market Makers to enter orders, cancel existing orders, and receive executions and updates.

1.1 Architecture

The OTTO protocol is composed of logical messages passed between the OTTO host and the client application. Each message type has a fixed message length. All messages are composed of non-control ASCII bytes.

All messages sent from the OTTO host to the client are assumed to be sequenced and their delivery must be guaranteed by some lower level protocol. The SoupTCP (available separately) is typically used to guarantee the delivery and sequencing of OTTO messages sent from the host to the client.

Messages sent from the OTTO 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 OTTO host port is bound to a NASDAQ assigned logical OTTO Account. On a given day, every order entered on OTTO is uniquely identified by the combination of the logical OTTO Account and the subscriber created Token field.

The NOM trading infrastructures may consist of multiple matching engines. Each engine trades all of the options for a range of underlyings. For example, options having underlyings with first characters of „A-H“ may be traded on matching engine #1, underlyings „I – O“ may be traded on matching engine #2, etc. Any change to symbol range boundaries would be communicated to firms in the form of a technical alert at least 2 weeks prior to the event.

The OTTO infrastructure is such that the firms connect to one or more servers residing directly on the matching engine infrastructure. Since there may be multiple matching engines, firms will need to connect to each engine's infrastructure in order to establish the ability to submit orders in the symbols handled by that engine.

The advantage to connecting directly to the engine's infrastructure is one of reduced latency. Additionally, all acknowledgement messages inherently indicate that the message being acknowledged is processed by the matching engine.

1.2 Data Types

Numeric fields, with exception of Order Reference Number, are a string of ASCII coded digits, right justified and zero filled on the left. Order Reference Number in Order Accepted and Cancel Replaced messages is a string of ASCII coded HEX digits right justified and zero filled on the left.

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

Prices, except for the explicit strike price, 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 zeros; 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. The maximum valid price value on NASDAQ is \$199,999.99. Sub-penny prices are automatically rounded to the nearest penny (buy side down, sell side up).

Timestamp fields are given in milliseconds past midnight Eastern Time.

The explicit strike price field (part of the OSI-compliant symbol identification) will be given as a 6 digit field with the decimal point placement determined by the Strike Price Denominator field (values are A through E).

Denominator Code	Whole Digits	Decimal Digits
A	5	1
B	4	2
C	3	3
D	2	4
E	1	5

The strike price denominator field will be determined by the value of the strike price:

if the strike price is <\$10 use E;
if the strike price is >=\$10 and <\$100 use D;
if the strike price is >=\$100 and <\$1000 use C;
if the strike price is >=\$1000 and <\$10000 use B;
if the strike price is >=\$10000 and <\$100000 use A;

For example, if the strike price is \$5.50, then the explicit strike price will be "550000" and the strike price denominator will be "E", representing one whole digit ("5") and 5 decimal digits ("50000").

If the strike price is \$205.75, then the explicit strike price will be "205750" and the strike price denominator will be "C", representing 3 whole digits ("205") and 3 decimal digits ("750").

1.3 Fault Redundancy

A single OTTO Account can be bound to multiple physical OTTO machines. These OTTO 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 OTTO hosts.

1.4 Service Bureau Configuration

A single OTTO Account can accept orders from one or more firms, allowing a service bureau configuration. The service bureau OTTO Account must be specifically authorized to enter trades on behalf of each represented subscriber with a [NASDAQ Service Bureau Agreement](#), available separately. Once an agreement has been submitted, the OTTO Account set up as the service bureau may enter orders for the represented firm by putting the represented firm's Market Maker Identifier in the Firm field upon order entry.

1.5 Important Notes

1.5.1 Continuous re-price

- Otto users have an option to have their orders cancelled subsequent to the initial order re-price if later the price of the order requires additional adjustment due to NBBO movement. NOM can also automatically re-price order on the book if so configured.
- Configuration to either cancel or continuously re-price orders is done by Firm ID.
- If a Firm is configured for continuous re-price an optional notification can be sent whenever order price is changed due to NBBO move. This information is delivered via Cancel Replaced Order Message with reason code "R".

1.6 Risk Protection

The NASDAQ options trading system offers a simple Risk Protection mechanism to assist subscribers in managing the execution of their orders. The system utilizes a Rapid Fire mechanism that cancels all the outstanding participant's orders based on configured execution parameters. Risk Protection can be initiated by either System or by explicit user request.

Once Risk Protection is triggered all incoming OTTO orders are rejected until an explicit Reenter control request is received by the system.

The scope of OTTO Risk Protection mechanism is one underlying for a given participant (firm). As a convenience mechanism OTTO supports Global risk protection control requests that apply to all the configured underlyings for the specified firm.

When the Rapid Fire risk protection mechanism is triggered, all open interest for the given participant ID will be protected from being further executed and will be cancelled.

Risk Protection Trigger Notification Message:

This message indicates that risk protection has triggered. It is transmitted by NASDAQ on all OTTO ports that are configured for the specified firm. Trigger message can have either Global (G), Underlying (P) Auto-Kill-Switch(K), or Manual-Kill-Switch(M) scope. System initiated Rapid Fire can have either Underlying (P) Auto-Kill-Switch(K) or Manual-Kill-Switch(M) scope. User initiated Risk Protection Trigger can have either Global (G) or Underlying (P) scope as specified in the Risk Protection Control message. **Note that User initiated Global Risk Protection requests will result in individual Risk Protection Trigger Notification Messages for each individual underlying that has been purged.**

Risk Protection Reset Notification Message:

This message indicates that risk protection has been reset. It is transmitted by NASDAQ on all OTTO ports configured for the specified firm. Reset message can have either Global (G), Underlying (P) or Kill-Switch (K) scope. **Note that User initiated Global Risk Protection requests will result in individual Risk Protection Trigger Notification Messages for each individual underlying that has been reset.**

Risk Protection Control Message:

This message controls the state of the risk protection system. Firms can send "G" and "P" messages to reset the risk protection system after a corresponding trigger has occurred or "A" and "S" messages to force risk protection to trigger. The message may be sent to any OTTO port that is configured with risk protection for the specified firm. The reset will take effect on all OTTO ports configured for the specified firm.

Risk Protection Control Acknowledgement Message

This message is sent by NASDAQ to acknowledge the receipt of a Risk Protection Control Message. It is transmitted on the OTTO port that had received the control request message.

Risk Protection Control Reject Message

This message indicates that a Risk Protection Control Message cannot be processed. See the message definition below for a listing of the specific reject reasons. It is transmitted on the OTTO port that had received the control request message.

NOTE: The Underlying is in most cases the same as the industry standard ticker underlying except for cases where the industry standard ticker underlying exceeds 5 bytes (internal system limit). The exchange also assigns unique underlyings for special settlement symbols.

2 Inbound Messages

Inbound messages are sent from the subscriber's application to the OTTO 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 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's fail-over redundancy. Should your connection ever fail, there is no way for you to know if pending messages actually made it over the link before the failure. A robust OTTO client can safely re-send any pending messages over a mirrored link without worrying about generating duplicates. This applies to NASDAQ's disaster fail over capability as well; should NASDAQ ever need 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 OTTO 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.

Each new order must have a Token that is unique to the day and that logical OTTO 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.

Cross/Auction Orders

Immediate or Cancel orders (Time in Force of 0) entered prior to market open will participate in the Opening Auction (Cross), but not stay live beyond the Opening Auction. This is the only way to designate an order to only participate in the Opening Auction. An order entered prior to market open with a Time in Force other than 0 will stay live after the Opening Auction and will enter the continuous market.

Minimum Quantity orders are not allowed for the Opening Auctions. This field should be 0.

Enter Order Message

Enter Order Message				
Name	Offset	Len	Value	Notes
Message Type	0	1	O	Enter Order Message type
OrderToken	1	20	Alphanumeric	This is a free-form alpha-numeric field. You can put any information you like. Token must be day unique for each OTTO account. Token is case sensitive, but mixing upper- and lower-case Tokens is not recommended.
Buy/Sell Indicator	21	1	Alpha	Can be "B" for a buy order, "S" for a sell order.

OpenClose	22	1	Alpha	"O" = opening position "C" = closing position
Contracts	23	6	Numeric	Total number of contracts entered. Must be greater than zero.
Option Symbol	29	6	Alphanumeric	Denotes the option root symbol used to identify a particular instrument. In most cases, this is also the symbol of the underlying security
Expiration Month and Put/Call	35	1	Alphabetic	Expiration Month and Put / Call indicator A-L are calls: Jan through Dec M-X are puts: Jan through Dec
Expiration Date	36	2	Numeric	Day of the Month of expiration (01-31)
Expiration Year	38	2	Numeric	Last two digits of the year of the option expiration
Strike price denominator	40	1	Alphabetic	Code to determine decimal location within the strike price (A – E) A= 5.1, B=4.2, C=3.3, D=2.4, E=1.5
Explicit strike price	41	6	Numeric	Explicit strike price
Price	47	10	Price	For limit orders, it is the price of the order. The price is a 6 digit whole number portion followed by a 4 digit decimal portion. The whole number part should be left padded with zeros and the decimal part must be right filled with zeros. Must be greater than zero.
Time in Force	57	5	Numeric	0 - Immediate or cancel. If no match for the order is available at the moment the order is accepted, any unexecuted contracts in the order are immediately canceled. 99998 - Market Day. Indicates that the order should live until the market close. Any Time In Force other than "Market Day" is automatically changed to 0
Firm	62	4	Alphanumeric	Firm Identifier for the order entry firm. One logical OTTO Account can potentially enter orders for multiple firms (MM badges).
Display	66	1	Alpha	"Y" = Displayed "P" = Post-Only (cannot be IOC, ISO, or Min. Quantity)
Capacity	67	1	Alpha	"M" – Nasdaq Registered MarketMaker "O" – Other Exchange Registered Market Maker (must be Post-Only) "C" – Customer (must be Post-Only) "B" – Broker-Dealer (must be Post-Only) "F" – Firm (must be Post-Only) "P" – Pro-Customer (must be Post-Only) "J" – Joint Back Office (must be Post-Only)
Minimum Quantity	68	6	Numeric	Minimum number of contracts that could be traded. Allowed to be non-zero only for

				IOC orders.
Cross Type	74	1	Alpha	N = none (e.g., this is a continuous book order)
ClearingAccount	75	4	Alphanumeric	This field is passed through to the OCC sub-account field – at the OCC this field is used to clear the trade to the proper market maker account. The value for this field is sometimes referred to as "Badge #" or "Market Maker ID," and is usually a 3-character alpha-numeric acronym.
Intermarket Sweep Eligible	79	1	Alpha	Intermarket Sweep (ISO) Eligibility: Y – eligible N – not eligible

2.2 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 number of contracts 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 Contracts field of zero.

Cancel Order Message				
Name	Offset	Len	Value	Notes
Type	0	1	X	Cancel Order Message.
Order Token	1	20	Alphanumeric	The Order Token as was originally transmitted in an Enter Order Message. If this is a cancel for an order that has been updated using the "Cancel Replace Order Message", this should be the most recent "New Token."
Contracts	21	6	Numeric	This is the new intended order size. This limits the maximum number of contracts that can potentially be executed in total after the cancel is applied. Entering a zero here will cancel any remaining open contracts on this order.

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.

2.3 Cancel Replace Order Message

The Cancel/Replace order message is used to change the parameters of an existing order.

Do not use this message to cancel the remaining quantity of an outstanding order, use the Cancel Request message for this purpose.

The Cancel Replace order message will only be accepted if the order can successfully be pulled back from the system. Requests that cannot be processed due to the invalid field or execution will result in a cancel order message.

The Cancel Replace order message is described in the following table:

Cancel Replace Order Message				
Name	Offset	Len	Value	Notes
Type	0	1	U	Cancel Replace Order Message.
Old Token	1	20	Alphanumeric	The most recent token used on this order. If this is the first

				Cancel/Replace, this would be the token on the original order. If this order has been replaced multiple times, it is the most recent 'New Token'.
New Token	21	20	Alphanumeric	The new token for the replacement order.
Contracts	41	6	Numeric	This is the new intended order size. This limits the maximum number of contracts that can potentially be executed in total after the cancel is applied. Entering a zero here will cancel any remaining open contracts on this order.
Price	47	10	Price	For limit orders, it is the price of the order. The price is a 6 digit whole number portion followed by a 4 digit decimal portion. The whole number part should be left padded with zeros and the decimal part must be right filled with zeros. Must be greater than zero.
Time in Force	57	5	Numeric	Please see "Enter Order Message" Time in Force for details.
Display	62	1	Alpha	Please see "Enter Order Message" Display for details. Must be the same as Display of the original order.
Minimum Quantity	63	6	Numeric	Please see "Enter Order Message" Minimum Quantity for details
Intermarket Sweep Eligible	69	1	Alpha	Please see "Enter Order Message" Intermarket Sweep Eligible for details.

2.4 Risk Protection Control Message

This message is sent by the subscriber to reset the risk protection system after a risk protection trigger has occurred or to initiate a trigger of the risk protection system.

Risk Protection Reset Message				
Name	Offset	Len	Value	Notes
Type	0	1	N	Risk Protection Reset Message.
Trigger Type	1	1	P, G, S, A	Type of trigger: P = reset firm/underlying pair G = Global reset, when set, underlying must be " " (all spaces); otherwise, connection will be dropped S = trigger risk protection for firm/underlying pair A = trigger risk protection globally; underlying must be " " (all spaces); otherwise, connection will be dropped.
Firm	2	4	Alpha	The "firm" portion of the firm/underlying pair for which risk protection is to be reset or triggered.
Underlying	6	6	Alpha	The "underlying entity" portion of the firm/underlying pair for which risk protection is to be reset or triggered. In case when the Trigger Type is 'G' or 'A' this field should be all spaces (" ").

3 Outbound Sequenced Messages

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

3.1 System Event Messages

System Event Messages signal events that affect the entire NASDAQ system

System Event Message				
Name	Offset	Len	Value	Notes
Timestamp	0	8	Timestamp	See Data Types above.
Message Type	8	1	S	System Event Message identifier.
Event Code	9	1	Alpha	See Event Codes below.

System Event Codes	
Code	Explanation
S	Start of Day. This is always the first message each

	day. It indicates that NASDAQ is open and ready to start accepting orders.
E	<i>End of Day</i> . This indicates that NASDAQ is now closed and will not accept any new orders in this session. There will not be any more 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

An Order Accepted 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				
<i>Name</i>	<i>Offset</i>	<i>Len</i>	<i>Value</i>	<i>Notes</i>
Timestamp	0	8	Numeric	Timestamp.
Message Type	8	1	A	Order Accepted Message Identifier
OrderToken	9	20	Alphanumeric	The Order Token field as entered.
Buy/Sell Indicator	29	1	Alpha	Buy/sell indicator as specified on the order.
OpenClose	30	1	Alpha	The OpenClose value specified on the order.
Contracts	31	6	Numeric	Total number of contracts accepted.
Option Symbol	37	6	Alphanumeric	The option symbol as specified on the order.
Expiration Month and Put/Call	43	1	Alphabetic	Expiration Month and Put / Call indicator as entered
Expiration Date	44	2	Numeric	Expiration date as entered
Expiration Year	46	2	Numeric	Expiration year as entered
Strike price denominator	48	1	Alphabetic	Strike price denominator as entered
Explicit strike price	49	6	Numeric	Explicit strike price as entered
Price	55	10	Price	The accepted limit price of the order. Note that the accepted price could potentially be different than the entered price if the order was re-priced by NASDAQ on entry. The accepted price will always be better than or equal to the entered price.

Time-in-Force	65	5	Numeric	The accepted Time in Force of the order. Note that the accepted Time in Force may potentially be different than the entered Time in Force.
Firm	70	4	Alpha	The accepted firm for the order.
Display Indicator	74	1	Alpha	The display type for the order. The accepted display type may be different from the entered type. Y – visible order displayed as specified N – hidden. Z – NBBO CONFORMANT, displayed one minimum increment away from price specified in this message R – re-priced, displayed at price specified in this message
Capacity	75	1	Alpha	The capacity specified on the order.
Minimum Quantity	76	6	Numeric	The minimum quantity specified on the order.
CrossType	82	1	Alpha	The accepted cross type (auction) of the order
ClearingAccount	83	4	Alphanumeric	The clearing account specified on the order.
Order Reference Number	87	9	Hex-Numeric	The day-unique Order Reference Number assigned by Nasdaq to this order.

Display Indicator

Display Indicator – Indicates the display attribute. Possible values are: visible (Y), hidden (N), conformant (Z), re-priced (R). Re-priced display indicates that the order was accepted, but re-priced and displayed at the price specified in the message. Conformant display indicates that the order was accepted, but re-priced and displayed one tick away from the price designated in the message (which is also equal to the NASDAQ view of the NBBO).

3.2.2 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
- the result of the order timing out
- the result of the order being canceled automatically
- The result of a cancel replace order message due to the new replaced quantity that is less than or equal to the original order's executed quantity.
- The result of a cancel replace order message that has been rejected due to an invalid value in one of the message fields.

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				
<i>Name</i>	<i>Offset</i>	<i>Len</i>	<i>Value</i>	<i>Notes</i>
Timestamp	0	8	Numeric	Timestamp.
MessageType	8	1	C	Canceled Order Message
OrderToken	9	20	Alphanumeric	The OrderToken field as entered.
Decrement Contracts	29	6	Numeric	The number of contracts just decremented from the order. This number is incremental, not cumulative.
Reason	35	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.

Cancel Order Reasons	
<i>Reason</i>	<i>Explanation</i>
"U"	User requested cancel. Sent in response to a Cancel 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 shares were immediately canceled.
"T"	Timeout. The Time In Force for this order has expired.
"S"	Supervisory. This order was manually canceled or reduced by a Nasdaq supervisory terminal. This is usually in response to a subscriber request via telephone.
"D"	This order cannot be executed because of a regulatory restriction (e.g. trade through restrictions).
"R"	This order was cancelled by the Risk Protection Monitor
"Q"	Anti-Internalize. The order was cancelled by the system to avoid trading with another order or quote with the same firm Id
"B"	Post-Only Order canceled to avoid being displayed at the price other than its limit
"C"	Cancel on Disconnect

3.2.3 Cancel Replaced Order Message

A Cancel Replaced Order Message informs you that an order has been cancelled and that a new order has been acknowledged.

Canceled Replaced Order Message				
<i>Name</i>	<i>Offset</i>	<i>Len</i>	<i>Value</i>	<i>Notes</i>
Timestamp	0	8	Numeric	Timestamp.
MessageType	8	1	U	Cancel Replaced Order Message
Old Token	9	20	Alphanumeric	The OrderToken field as entered.
Reason	29	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.
New Token	30	20	Alphanumeric	The new token for the replacement order.
Buy/Sell Indicator	50	1	Alpha	Buy/sell indicator as specified on the order.
OpenClose	51	1	Alpha	The OpenClose value specified on the order.
Contracts	52	6	Numeric	Total number of contracts accepted.
Option Symbol	58	6	Alphanumeric	Option symbol as specified on the order
Expiration Month and Put/Call	64	1	Alphabetic	Expiration Month and Put / Call as entered
Expiration Date	65	2	Numeric	Expiration date as entered
Expiration Year	67	2	Numeric	Expiration year as entered
Strike price denominator	69	1	Alphabetic	Strike price denominator as entered
Explicit strike price	70	6	Numeric	Explicit strike price as entered
Price	76	10	Price	The accepted limit price of the order. Note that the accepted price could potentially be different than the entered price if the order was re-priced by NASDAQ on entry. The accepted price will always be better than or equal to the entered price.
Time-in-Force	86	5	Numeric	The accepted Time in Force of the order. 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.
Firm	91	4	Alpha	The accepted firm for the order.
Display Indicator	95	1	Alpha	The display type for the order. The accepted display type may be different from the entered type. Y – visible order displayed as specified N – hidden. Z – NBBO CONFORMANT, displayed one minimum increment away from price specified in this message R – re-priced, displayed at price specified in this message
Capacity	96	1	Alpha	The capacity specified on the replacement order.

Minimum Quantity	97	6	Numeric	The minimum quantity specified on the replacement order.
CrossType	103	1	Alpha	The cross type (auction) specified on the replacement order
ClearingAccount	104	4	Alphanumeric	The clearing account specified on the order.
Order Reference Number	108	9	Hex-Numeric	The day-unique Order Reference Number assigned by Nasdaq to this order.

Display Indicator

Display Indicator – Indicates the display attribute. Possible values are: visible (Y), hidden (N), conformant (Z), re-priced (R). Re-priced display indicates that the order was accepted, but re-priced and displayed at the price specified in the message. Conformant display indicates that the order was accepted, but re-priced and displayed one tick away from the price designated in the message (which is also equal to the NASDAQ view of the NBBO).

Cancel Replaced Order Reasons	
<i>Reason</i>	<i>Explanation</i>
"U"	User requested cancel. Sent in response to a Cancel Replaced Message.
"S"	Supervisory. This order was manually canceled or reduced by a Nasdaq supervisory terminal. This is usually in response to a subscriber request via telephone.
"R"	Re-priced to price specified in this message due to NBBO change
"D"	This order cannot be executed because of a regulatory restriction (e.g. trade through restrictions).

3.2.4 Executed Order Message

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

Executed Order Message				
<i>Name</i>	<i>Offset</i>	<i>Len</i>	<i>Value</i>	<i>Notes</i>
Timestamp	0	8	Numeric	Timestamp.
MessageType	8	1	E	Order Executed Message.
Order Token	9	20	Alpha-numeric	The OrderToken as entered.
Executed Contracts	29	6	Numeric	Incremental number of contracts executed.
Execution Price	35	10	Price	The price at which these contracts were executed.
Liquidity Flag	45	1	Alpha	See Liquidity Flag Values table below.
Match Id	46	9	Numeric	Identifies the component of an execution transaction.
Cross Id	55	9	Numeric	Identifies the execution transaction within matching engine. This can be matched with the Cross Id in the exchange Clearing Trade Interface (CTI) messages. Multiple executions with different Match Id can potentially share the same Cross Id

Liquidity Flags	
<i>Flag</i>	<i>Value</i>
A	Added
R	Removed
O	Market Opening Auction
C	
L	

Note: Clients should anticipate additions to this list and thus support all capital letters of the English alphabet

3.2.5 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				
<i>Name</i>	<i>Offset</i>	<i>Len</i>	<i>Value</i>	<i>Notes</i>
Timestamp	0	8	Numeric	Timestamp.
Message Type	8	1	B	Broken Trade Message.
Order Token	9	20	Alphanumeric	The OrderToken field as entered.

Match Id	29	9	Numeric	Match Number as transmitted in the preceding Executed Order Message.
Cross Id	38	9	Numeric	Cross Number as transmitted in the preceding Executed Order Message
Reason	47	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.

Broken Trade Reasons	
Reason	Explanation
"E"	Erroneous. The trade was deemed clearly erroneous.
"C"	Consent. The two parties mutually agreed to break the trade.
"S"	Supervisory. The trade was manually broken by a Nasdaq supervisory terminal.
"X"	External. The trade was broken by an external 3 rd party.

3.2.6 Rejected Order Message

A Rejected Order Message may be sent in response to an Enter Order Message if the order cannot be accepted at this time. The reason for the rejection is given. No further actions are permitted on this order.

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

Rejected Order Message				
Name	Offset	Len	Value	Notes
Timestamp	0	8	Numeric	Timestamp.
Message Type	8	1	"J"	Rejected Order Message.
Order Token	9	20	Alphanumeric	This is the order Token field as was transmitted with the order when entered.
Reason	29	1	Alpha	The reason the order was rejected. See currently supported Rejected Order Reasons below. Clients should anticipate additions to this list and thus support all capital letters of the English alphabet.

Rejected Order Reasons	
Reason	Explanation
"T"	Test Mode. This OTTO 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 on the primary exchange so no orders can be accepted in these options at this time.
"Z"	Contracts exceeds configured safety threshold. The number of contracts entered must be less than the safety threshold configured for this Account. The safety threshold can be

	added/updated through NASDAQ Subscriber Services.
"S"	Invalid symbol. The symbol field must be a valid issue, tradable on NASDAQ.
"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.
"A"	Invalid Capacity.
"C"	NASDAQ is closed.
"L"	Requested firm not authorized for requested clearing type on this account. To authorize additional firms, use the Nasdaq Service Bureau Agreement.
"M"	Outside of permitted times for requested clearing type.
"R"	This order is not allowed in this type of cross/auction (option or time restrictions)
"X"	Invalid price.
"N"	Invalid Minimum Quantity.
"P"	Only Closing Positions are Allowed
"V"	Risk Protection in effect.
"E"	Symbol not permitted for the specified firm
"B"	Post-Only Order rejected to avoid being displayed at the price other than its limit
"K"	Kill-Switch Reentry Required

3.3 Risk Protection

3.3.1 Risk Protection Trigger Message

The Risk Protection Trigger Message is sent to indicate that the system's Risk Protection Monitor has triggered

Risk Protection Trigger Message				
Name	Offset	Len	Value	Notes
Timestamp	0	8	Numeric	Timestamp.
Message Type	8	1	N	Risk Protection Triggered Message
Trigger Type	9	1	P, G, K, M	Type of trigger: P = firm/underlying pair G = Global K = Auto-Kill-Switch M = Manual-Kill-Switch
Firm	10	4	Alpha	The "firm" portion of the firm/underlying pair for which risk protection has triggered.
Underlying	14	6	Alpha	The "underlying entity" portion of the firm/underlying pair for which risk protection has triggered. Individual risk protection trigger messages will be sent per underlying when the trigger type is 'G'. It will be spaces when the trigger type is

				'K' or 'M'.
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3.3.2 Risk Protection Reset Message

The Risk Protection Reset Message is sent to indicate that the system's Risk Protection Monitor has been reset

Risk Protection Reset Message				
Name	Offset	Len	Value	Notes
Timestamp	0	8	Numeric	Timestamp.
Message Type	8	1	M	Risk Protection Reset Message
Trigger Type	9	1	P, G, K	Type of trigger: P = firm/underlying pair G = Global K = Kill-Switch
Firm	10	4	Alpha	The "firm" portion of the firm/underlying pair for which risk protection has been reset.
Underlying	14	6	Alpha	The "underlying entity" portion of the firm/underlying pair for which risk protection has been reset. Individual risk protection trigger messages will be sent per underlying when the trigger type is 'G'. It will be spaces when the trigger type is 'K'.

3.3.3 Risk Protection Control Reject Message

The Risk Protection Control Reject Message is sent in response to a Risk Protection Control Message that cannot be accepted. The reason for the reject is provided.

Risk Protection Control Reject Message				
Name	Offset	Len	Value	Notes
Timestamp	0	8	Numeric	Timestamp.
Message Type	8	1	T	Risk Protection Control Reject Message
Trigger Type	9	1	Alpha	Trigger Type as provided in the control message
Firm	10	4	Alpha	Firm as provided in the control message.
Underlying	14	6	Alpha	Underlying as provided in the control message. Will be spaces when the trigger type is 'G'.
Reason	20	1	Alpha	Reject Reason. See reason codes below.

Rejected Risk Protection Control Reasons	
Reason	Explanation
L	Specified Firm is not authorized on this account.
S	Invalid underlying.
K	Killswitch Risk Protection is in effect, and it requires manual reset.

3.3.4 Risk Protection Control Acknowledgement Message

The Risk Protection Control Acknowledgement Message is sent in response to a Risk Protection Control Message. This message indicates that the control message has been received and processed by NASDAQ system.

Starting OTTO version 1.4c, Risk Protection Control Acknowledgement will be per underlying.

Risk Protection Control Acknowledgement Message				
Name	Offset	Len	Value	Notes
Timestamp	0	8	Numeric	Timestamp.
Message Type	8	1	R	Risk Protection Control Acknowledgement Message
Trigger Type	9	1	Alpha	Trigger Type as provided in the control message
Firm	10	4	Alpha	Firm as provided in the control message.
Underlying	14	6	Alpha	Underlying as provided in the control message. Will be spaces when the trigger type is 'G'.

3.4 Notifications

Notification messages are optional and should be specifically requested when setting up a NASDAQ OTTO account.

3.4.1 Options Directory

This optional message provides information detailing the options traded on the system.

Options Directory Message				
Name	Offset	Len	Value	Notes
Timestamp	0	8	Numeric	Timestamp.
Message Type	8	1	D	Options Directory Message
Security Symbol	9	6	Alphanumeric	Denotes the options symbol used for a particular instrument. In most cases, this is also the symbol of the underlying security
Expiration Month and Put/Call	15	1	Alphabetic	Expiration Month and Put / Call indicator A-L are calls: Jan through Dec M-X are puts: Jan through Dec
Expiration Date	16	2	Numeric	Day of the Month of expiration (01-31)
Expiration Year	18	2	Numeric	Last two digits of the year of the option expiration
Strike price denominator	20	1	Alphabetic	Code to determine decimal location within the strike price (A – E) A= 5.1, B=4.2, C=3.3, D=2.4, E=1.5
Explicit strike price	21	6	Numeric	Explicit strike price
Options Closing Type	27	1	Alphabetic	Denotes which System Event is used to trigger the option closing process. "N" = Normal Hours "L" = Late Hours

Underlying Symbol	28	6	Alphanumeric	Denotes the unique symbol assigned to the underlying security within NOM Execution System.
Option ID	34	8	Numeric	NASDAQ Option ID assigned daily, valid for the trading day
Trade On Exchange	42	1	Alphabetic	Denotes whether or not this option is tradable at the exchange. The allowable values are: "Y" = Option is tradable "N" = Option is not tradable

3.4.2 Net Order Imbalance Indicator (NOII)

This optional message will be disseminated during opening auction starting 9:25 at 5-second intervals. It will also be disseminated during re-opening auctions at 5-second intervals.

NOII Message				
Name	Offset	Len	Value	Notes
Timestamp	0	8	Numeric	Timestamp.
Message Type	8	1	F	NOII message
Security Symbol	9	6	Alphanumeric	Denotes the options symbol used for a particular instrument. In most cases, this is also the symbol of the underlying security
Expiration Month and Put/Call	15	1	Alphabetic	Expiration Month and Put / Call indicator
Expiration Date	16	2	Numeric	Expiration date
Expiration Year	18	2	Numeric	Expiration year
Strike price denominator	20	1	Alphabetic	Strike price denominator
Explicit strike price	21	6	Numeric	Explicit strike price
Paired Contracts	27	9	Numeric	total number of contracts eligible to be matched at the Current Reference Price
Imbalance Contracts	36	9	Numeric	the number of contracts not paired at the Current Reference Price
Imbalance Direction	45	1	Alphabetic	market side of imbalance
Current Reference Price	46	10	Numeric	price at which NOII is being calculated
Cross Type	56	1	Alphabetic	
Option ID	57	8	Numeric	

4 Support

If you have any questions or comments about this specification, just E-mail to devsupport@nasdaq.com. We also welcome any suggestions for new features or improvements.

5 Revision History

Version	Date	Comment
1.4d	11/7/2017	Added Cancel Reason for Cancel on Disconnect.
1.4c	10/03/2016	Global Risk Protection Control requests will now result in one notification for each Underlying that is purged or reset as a result of the request.
1.4b	09/22/2014	Additional Risk Protection Trigger type Kill-Switch ('K') added.
1.4a	07/29/2014	Added Joint BackOffice Order capacity ('J')
1.4	01/09/12	Added support for Post-only orders
1.3	10/12/11	Added Table Of Contents
1.3	09/09/11	Updated Order Reference Number to be Hex-Numeric
1.3	08/18/11	Added description of potential for multiple match engines and thus multiple OTTO connections
1.3	08/01/11	Added new Capacity 'O' for market maker not registered on NASDAQ
1.3	02/22/11	Deleted reference to Firm field requirement in section 1.5.2. Firm is not a required field.
1.3	12/7/10	Please see chapter 1.5
1.23-OSI	10/8/10	Revised the go live date for capacity value "P"
1.22-OSI	4/21/10	Added "P" capacity value
1.21-OSI	3/15/10	Added support for ISO orders
1.20-OSI	2/1/10	Updated data types description to illustrate how the strike price denominator is determined Removed "N", "A", "S" display values
1.19-OSI	8/10/09	Provide OSI compliant version in sync with version 1.19
1.19	7/21/09	Added "F", "T" liquidity codes Added "S" display flag for ADOP
1.18-OSI	6/8/09	OSI compliant version of 1.18

1.18	5/28/09	Added ISO flag to enter order message Added ISO flag to cancel/replace message
1.17	09/25/08	Added new client facing Risk Protection Reset message
1.16	09/22/08	Changed Risk Protection Reset message to Risk Protection Control Message
1.15	09/18/08	Added Global Risk Protection
1.14	07/17/08	Clarified Order Token usage on the Cancel Order Message
1.13	5/19/08	-Changed Risk Protection Reset Reject Message type to T from K - Clarified Cross type in section 3.2.1 - Changed system event code from "M" to "E"
1.12	4/25/08	Added Risk Protection Reset Acknowledgement Message
1.11	4/23/08	Added Risk Protection Reset Reject Message
1.10	4/16/08	Added Risk Protection Trigger/Reset Messages
1.04	03/28/08	Clarified Clearing Account field.
1.03	3/24/08	Added "R" code for Risk Protection Cancel.
1.02	1/28/08	Added Cancel/Replace
1.01	12/21/07	Wording Change (Cross/Auction)
1.0	12/05/07	Official Release
0.2	7/19/07	- Added ClearingAccount to New Order Message - Token is now 20 in length - Symbol is now 7 in length - Updated Cross Type values - Added "P" order reject reason
0.1	4/25/07	Initial dissemination to developers