

Ouch to Trade Options (OTTO) Specifications

Version 2.1.6 June 21, 2023

Table Of Contents

- 1. Introduction 3
 - 1.1. Features 3
 - 1.2. Limitations 4
- 2. Message Processing 4
 - 2.1. Architecture 4
 - 2.2. Fault Redundancy 4
 - 2.3. Inbound Message Handling 4
 - 2.4. Data Types 5
 - 2.5. Request-reply semantics 5
 - 2.6. System generated messages 6
- 3. NOM Market Description 6
 - 3.1. Participant identification 6
 - 3.2. Risk Protection 6
 - 3.3. Special Order Types 6
- 4. GEMX and MRX Market Description 7
 - 4.1. Participant identification 7
 - 4.2. Risk Protections 8
 - 4.3. Auctions 8
 - 4.4. Complex Orders 13
 - 4.5. Special Order Types 13

5. Request Messages	15
5.1. New Order	15
5.2. Replace Order	18
5.3. Cancel Order	19
5.4. Mass Cancel	19
5.5. New Cross Order	20
5.6. Add Complex Instrument	22
5.7. Modify Trade	22
5.8. Member Kill Switch Request	24
5.9. Subscription Request	24
6. Notification Messages	25
6.1. System Event Message	25
6.2. Instrument Directory Messages	25
6.3. Instrument Trading Action Message	26
6.4. Auction Notification	26
6.5. Order Accepted	27
6.6. Order Replaced	29
6.7. Order Canceled	30
6.8. Order Executed	30
6.9. Trade Details	31
6.10. Cross Order Accepted	33
6.11. Member Kill Switch Notification	35
7. Other Messages	35
7.1. Mass Cancel Response	35
7.2. Add Complex Instrument Response	35
7.3. Modify Trade Response	36
7.4. Subscription Response	36
7.5. Reject	36
7.6. Pending Response	36
8. Appendix	37
8.1. Field Details	37
8.2. Market Parameters	42
9. Revision Control Log	43

1. Introduction

OTTO 2.1.5 protocol is modeled on semantics of Nasdaq binary OUCH, but is extended to accommodate the needs of options trading Nasdaq GEMX and MRX as well as needs of non-market-maker participants. OTTO2.1.5 provides ability to:

- Enter Simple orders (enter/replace/cancel)
- Enter Complex orders, including stock combos (enter/replace/cancel)
- Enter Cross orders
- Enter Auction Orders and Responses
- Create New Complex Instruments
- Mass-cancel orders based on flexible criteria
- Modify Trades (post-trade reassignment) OTTO 2.1.5 sends to the participant:
- Symbol definitions (simple and complex)
- New Auction Notifications (all auction types)
- Simple Orders Info (added/replaced/canceled)
- Complex Orders Info (added/replaced/canceled)
- Cross Order Info (added/replaced/canceled)
- Execution Info (simple/complex/complex legs)

1.1. Features

- OTTO 2.1.5 protocol is binary
- High performance
- Uses widely accepted Soup 3 as the underlying session protocol
- Uses single-key instrument identification as provided by simple and complex directory notifications (as opposed to carrying full symbology info on all requests)
- Supports entry/management of complex orders
- Supports ability to define new complex instruments including stock combos
- Supports Auction initiation
- Supports Auction responses
- Supports request to modify clearing information on trades

1.1.1. Unified compact messaging

OTTO 2.1.5 uses the same set of messages to manage (add/replace/cancel/mass-cancel) orders for both Simple and Complex Instruments.

1.1.2. High Performance Protocol

- OTTO 2.1.6 is modeled after the best practices of NASDAQ Ouch ports
- Supports Short Form for **New Order** (incoming) and **Order Accepted** (outgoing) messages to maximize performance and minimize bandwidth.
- Supports Order cancelation via either Client or Exchange assigned identifiers

1.2. Limitations

1.2.1. Unsupported Order types

The following order types are not supported by OTTO and must be entered using FIX interface on GEMX and MRX:

- Routable Orders (DNR is implied on all order types entered via OTTO)
- Stop, Stop/Limit Orders
- GTC/GTD Orders
- QCC

2. Message Processing

2.1. Architecture

- OTTO protocol is composed of logical messages passed between the OTTO host and the client application.
- All message types with exception of **Complex Instrument definition** and **Modify Trade** are fixed length.
- All messages sent from the OTTO host to the client are assumed to be sequenced, and their delivery is guaranteed by the **SoupBinTCP** lower level protocol.
- Messages sent from the OTTO client to the exchange host are inherently non-guaranteed, even if they are carried by a lower level protocol that guarantees delivery (like TCP/IP sockets). It is

responsibility of the client to process exchange's response to observe the status of the submitted request.

- Each physical OTTO host port is bound to an Exchange-assigned logical OTTO Account. Orders entered on a given Account can only be canceled or replaced by the originating Account.

2.2. 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 all types of requests, and any outbound messages would be simultaneously generated by both physical OTTO hosts.

2.3. Inbound Message Handling

Inbound messages sent from the participant's application to the OTTO host are not sequenced. Nonetheless, all Inbound Messages may be repeated benignly. This gives the client the ability to re-send any inbound message if it is uncertain whether Exchange 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 OTTO'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 OTTO client can safely re-send any pending messages over a mirrored link without worrying about generating duplicates. This applies to Exchange's disaster fail over capability as well; if Exchange 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 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.

2.4. Data Types

Type	Description
Integer	Unsigned big-endian (network byte order) binary encoded number.
Price	Signed 8-byte integer field with implied scale of 6 (number of digits to the right of the decimal point). Prices for complex instruments can be positive, negative or zero.
Alpha Alphanumeric	Alpha or Alphanumeric field is left-justified and padded with spaces on the right. Field must contain printable ASCII characters only. A non-printable character in such field causes OTTO to immediately disconnect its client

2.5. Request-reply semantics

OTTO Protocol is comprised of messages that can be divided into the following categories:

Category	Description
Request	Inbound message carrying participant's request
Notification	Notification message is sent by OTTO either in response to a Request or due to market activity. Most Requests are associated with a single specific Notification Message Type (e.g. New Order results in Order Accepted). Such Requests receive no other positive ACKs. See table of Request to Notification mapping.
Reject	Reject is sent by OTTO in response to a Request that is deemed invalid. Reject message contains error code explaining the reason for rejection as well as ClOrdId/ClRequestId of the Request being rejected.
Pending Response	A Pending Response is sent by OTTO when a Request cannot be immediately, fully processed or validated, and indicates that the final status of the Request is not yet known (typically - any Request for a pending instrument). Pending Response is eventually followed by either a Notification associated with the Request or a Reject .
Subscription Response	Subscription Response indicates successful completion of a Subscription Request
Mass Cancel Response	Mass Cancel Response indicates completion of processing of a valid Mass Cancel Request.
Add Complex Instrument Response	Add Complex Instrument Response indicates successful creation of new Complex Instrument using Add Complex Instrument Request.
Modify Trade Response	Modify Trade Response indicates completion of processing of a valid Modify Trade Request

2.5.1. Request-Notification mapping

The following table maps inbound **Request** messages to the corresponding **Notification** messages that serve as positive acknowledgements.

Request	Corresponding Notification
New Order (long format)	Order Accepted (long format)
New Order (short format)	Order Accepted (short format)
Replace Order	Order Replaced
Cancel Order	Order Canceled
New Cross Order	Cross Order Accepted
Add Complex Instrument	Complex Instrument Directory
Member Kill Switch Request	Member Kill Switch Notification

2.5.2. Live Order Management

An Order entered on a given OTTO Account can only be canceled or replaced by the same Account. An OTTO user has the following options managing non-IOC orders in case of failure of the active OTTO connection:

- Try to reestablish OTTO connection
- Switch to a backup connection with the same Account to continue managing open orders
- Configure OTTO Account to perform automatic cancel-on-disconnect

2.6. System generated messages

Certain outbound **Notification** messages are asynchronously generated by the trading system due to market or exchange personnel activity. These messages include:

- System Event messages
- Instrument Trading Action messages
- Instrument Directory messages
- New Auction notifications
- Order Canceled messages
- Order Executed messages
- Trade Details messages

3. NOM Market Description

Note that NOM does not support OTTO 2.1.6 (or any version of OTTO) at this time and this section is a placeholder for future functionality.

3.1. Participant identification

Every user request carries:

- *FirmID* – Exchange assigned participant identifier (Badge for MM, Firm Mnemonic for others) Otto validates *FirmID* as well as its association with the port account.

3.2. Risk Protection

3.2.1. Cancel On Disconnect

OTTO Account can be configured to have orders entered on the Account to be automatically deleted on disconnect. When setting up an OTTO account select one of the following actions to be performed on disconnect:

- None (no orders get canceled)
- Cancel All Open Orders

3.3. Special Order Types

3.3.1. Post Only Orders

A Post Only Order is an order that is guaranteed to add liquidity (“Maker”) to the order book. If the order cannot be added to the book, it is canceled, or optionally, may be re-priced to allow it to rest on the book.

Firms are required to set up Post Only firm level configurations of “reprice” or “cancel”. Orders that are sent with an *ALOInst=Y* that do not have a firm level configuration in place will be rejected.

For example, if an incoming Post Only would lock or cross either or both of the IBBO or ABBO, a re-price Post Only would be re-priced one MPV away from the locked or crossed BBO, in order to uncross the BBO(s) and rest on the book, while a cancel

Post Only would simply be canceled.

An order is marked Post Only by setting ALOInst = "Y" and will follow the firm instructions for reprice or cancel.

Additional information:

- Post Only Orders can only be entered when the instrument is in a continuous trading state ("Regular"). If the instrument moves out of "Regular," any resting Post Only orders for that instrument are canceled.
- The only allowed validity time is Day (TIF = D).
- The only allowed order type is Limit (OrdType = L).
- All client categories are allowed.
- Post Only Orders cannot be marked "ISO" and will be rejected.
- Post Only Orders can be canceled and modified.
 - However, a non-Post Only cannot be modified to be a Post Only, and a Post Only cannot be modified to be a non-Post Only

3.3.2. Minimum Quantity Orders

A Minimum Quantity order must be filled completely upon entry or the entire order is immediately canceled. Note, Minimum Quantity orders will only be treated as immediate or cancel (IOC) orders. A Minimum quantity sent with a time in force of DAY or GTC will be converted to IOC and treated as described below.

The order attempts to match with the order book upon entry. If the order is not marketable, or if it is marketable but the order book does not contain sufficient quantity to execute the entire order, the order is canceled.

- To enter a Minimum Quantity order:
 - Use New Order (Long Form) message
 - Set MinQty <= Quantity
 - Set TIF = I(IOC)
 - Use New Order (Short Form)
 - Set TIF = F(FOK)
 - Note, MinQty will be inferred from the Quantity field

3.3.3. Price Improving Orders

A Price improving order is an order to buy or sell an option at a price increment smaller than the minimum price variation for that option. Price Improving Orders may be entered in penny increments with no special instructions on the New Order (Short Form) and New Order (Long Form) messages. Price Improving Orders that are available for display shall be displayed at the minimum price variation in that option and shall be rounded up for sell orders and rounded down for buy orders.

3.3.4. On the Open Orders (OPG)

An On the Open (OPG) market or limit order can only participate in the opening rotation and will be deleted after the opening process. OPG orders will be rejected if the exchange is in a regular trading state.

An OPG order is marked OPG by setting TIF = "IOC" (Immediate or Cancel) and Auction Type = "O" (Opening Auction)" on the New Order (Short Form) and New Order (Long Form) messages.

4. GEMX and MRX Market Description

4.1. Participant identification

Every user request carries:

FirmID – Exchange assigned participant identifier (Badge for MM, Firm Mnemonic for others) OTTO validates FirmID as well as its association with the port account.

4.2. Risk Protections

4.2.1. Cancel On Disconnect

OTTO Account can be configured to have orders entered on the Account to be automatically deleted on disconnect. When setting up an OTTO account select one of the following actions to be performed on disconnect:

- None (no orders get canceled)
- Cancel All Open Orders

4.2.2. Market-Wide Risk Protection (MWRP)

Market-Wide Risk Protection (MWRP) provides activity-based protections to establish limits for order entry and order execution rate. The protections include a specified number of orders allowed for order entry and a specified number of contracts allowed to be executed over a given time interval providing members with the ability to control the rate of order entry and trades executions.

If user order entry or trade execution exceeds set MWRP parameters within a specified time interval, system will activate the Kill Switch, which will either delete all open orders and prevent entry of new orders, or prevent entry of new orders.

- Defining MWRP parameters is mandatory for all members.
- MWRP parameters cannot be set via OTTO. NASDAQ Market Operations will configure MWRP parameters as defined by a member.
- After a Kill Switch has been activated for a firm, the member must contact Market Operations to re-enable the firm for order entry.
- Order entry rate protection will be enabled at 9:00 AM in the trading day to allow for a high rate of order load activity.
- Each Member must set the following parameters for its Firm ID:
 - Maximum number of orders entered for simple, complex, and complex with stock instrument type
 - Maximum number of contracts executed for simple, complex and complex with stock instruments
 - Time interval in milliseconds (must be set for each type of MWRP)
 - Kill Switch Action: Delete-and-Block or Block-Only (must be set for each type of MWRP)
- Each side of a two-sided auction and cross will be counted separately.
- Each component leg of a complex order will be counted in the total executed volume.
- Order modifications will not count towards the number of order rate calculations.
- MWRP parameter modifications can be made intraday by calling Market Operations.

4.3. Auctions

An auction is a process whereby an order is exposed to the market for a small amount of time, called the exposure period (see Auction Times). During the exposure period, market participants can respond to the auction to provide liquidity to the order being exposed. At the end of the exposure period, the order being exposed is executed against the responses and against the order book or cancelled without an execution or can rest on the book for Simple Exposed orders and Complex Exposure auctions. There are many different types of auctions, each with different rules.

Types of auctions include:

- One-sided Auctions
 - Block Auctions (initiated by Block order type)
 - Simple Exposed orders (created automatically by the system based on market conditions)
 - Complex Exposure Auctions

- Two-sided Auctions
 - Facilitation Auctions
 - PIM (Price Improvement) Auctions
 - Solicitation Auctions

4.3.1. One-sided Auctions

- One-sided auctions are auctions where the submitting broker supplies its response and is seeking to cross the orders. See Section 7.1.4 for supported two-sided auctions
- All auctions are initiated using New Order (Long Form) message
- The *AuctionType* field specifies the type of auction order being submitted.
- TIF for orders/responses may have a time validity of DAY or IOC
 - Note, Block Auctions can be entered as IOC or FOK
- Auction responses are entered using the **New Order** message and are limited to one per OTTO connection.
- Auction Responses can be replaced by using the **New Order** message to replace the existing response
- Auction response messages should specify the appropriate auction type as well as a valid *AuctionId*
- Multiple responses are allowed; however, each response replaces (overwrites) the previous response. Depending on the auction, responses may only be allowed to improve the previous response.
- Auctions Responses cannot be submitted DNTT and attempts will be rejected
- Auctions Responses can be submitted Sell Short Exempt

4.3.1.1. Block Auction

Participants can use the block auction to anonymously solicit contra-side liquidity for an order. A block order is an auctioned order with a minimum of 50 contracts. Block auctions are only available for simple instruments.

The block auction processing cycle follows these steps:

- An EAM enters a block order using New Order (Short Form) or New Order (Long Form) for a minimum number of contracts at a specified limit price.
 - The auction type (*AuctionType*) is set to **B** (Block Auction).
 - *AuctionId* must be set to 0
 - The EAM can specify which fields on the order they wish to disclose, including size, price, and side, using the *DisclosureMask*. By default, size, price, and side are always disclosed. The *DisclosureMask* can be used to hide any or all of those data.
- An auction is initiated and a message is broadcast via the Market Data Order feed announcing the block auction and describing the order being exposed. An Auction Notification message is also sent out on OTTO ports.
- Market participants can respond to the auction during the exposure period. The responses are hidden.
 - Response order must have *AuctionType* = B (Block Auction)
 - *AuctionId* must contain a valid identifier for an ongoing Block Auction.
- Price improvement must be in Penny increments.
- At the expiration of the exposure period, the order is executed against the responses and the order book. Any responses that are not executed are canceled.
- The participant can delete an active block order before the block timer expires. Responses may also be canceled.
- Block Auctions cannot be modified and any replace order request will be rejected

- Block orders may not be preferenced, but orders sent with preferencing instructions will be accepted with the *PreferredParty* field ignored
- Block Auctions can be entered as AON by
 - Use New Order (Long Form) message
 - Set Minqty = Quantity
 - Set TIF = I(IOC)
 - Use New Order (Short Form) message
 - Set TIF = F(FOK)
 - Note, Minqty will be inferred from quantity

4.3.1.2. Complex Exposure Auction

The complex exposure auction is used to obtain price improvement for orders in standard combination and stock combination instruments. Complex Exposure auctions are not available in simple instruments. All members can participate in the auction by entering responses to the auction order.

The complex exposure auction processing cycle follows these steps:

- An EAM enters a **New Order**:
 - *InstrumentId* must be of a complex instrument
 - *AuctionType* = E (Exposure Auction)
 - *AuctionId* must be set to 0
 - *OrderType* must be Limit or Market
 - The order may be preferenced
 - Remaining quantity at the end of the exposure period can rest or cancel on the book
 - TIF must be DAY for order to rest after the Exposure auction
 - TIF must be IOC for order to cancel after the Exposure auction
 - Each exposure order starts its own auction process
- An auction message is broadcast via the Market Data Order Feed stating that the auction has started and describing the order being exposed. An Auction Notification message is also sent out on OTTO ports.
- Market participants can respond to the auction during the exposure period, limited to one response. The responses are exposed, showing the aggregate quantity at the best price.
 - Response order must have *AuctionType* = E (Exposure Auction)
 - *AuctionId* must contain a valid identifier for an ongoing Exposure Auction.
- Auction Order limit price may be in penny increments for a standard combo order and 1/100th of a penny for stock combo orders
- Exposure orders can be canceled, which terminates the auction, or modified which also terminates the auction, but starts a new auction.
- Responses can be canceled.
- Any remaining quantity is canceled, as instructed, or posted to the order book.

4.3.1.3. Simple Exposure Order

A regular order cannot trade through the ABBO unless marked ISO. If any regular, marketable order, which is not an IOC and is not marked ISO, can receive a better execution price at a competing exchange, the Exchange exposes that order to its market participants in an attempt to obtain a price that matches or improves the away markets.

Orders entered via OTTO are not routable; they still can initiate an exposure notification, but any unexecuted volume is cancelled that is not filled during the exposure period.

- An exposure notification message is broadcast via Market Data stating that the auction has started and describing the order being exposed.
- An Auction Notification message is also sent out on OTTO ports, that will include this exposure update.
- Any unexecuted quantity that remains on an exposed order is canceled or posted to the book.

4.3.2. Two-sided Auctions

- Two-sided auctions are auctions where the submitting broker supplies its response and is seeking to cross the orders. See Section 7.1.4 for supported two-sided auctions
- All auctions are initiated using Cross Order message
- The *CrossType* field must be set to A (Auction)
- The *AuctionType* field specifies the type of auction order being submitted.
- TIF for orders/responses may have a time validity of DAY or IOC.
- Auction responses are entered using the New Order (Short Form) or New Order (Long Form) message and are limited to one per OTTO connection.
- Auction Responses can be replaced by using the New Order (Short Form) or New Order (Long Form) message to replace the existing response
- Auction response messages should specify the appropriate auction type as well as a valid *AuctionId*
- Auctions Responses cannot be submitted DNTT and attempts will be rejected
- Auctions Responses can be submitted Sell Short Exempt
- Side must be set to the opposite side of the primary part of the auction *CrossOrder*
- Multiple responses are allowed; however, each response replaces (overwrites) the previous response. Depending on the auction, responses may only be allowed to improve the previous response.
- Multiple auctions of any type can occur simultaneously for the same instrument, but only one PIM auction for an instrument can occur at a time. In other words, two facilitation auctions for the same instrument can occur at the same time, or a facilitation auction and a PIM auction for the same instrument, but two PIM auctions for the same instrument cannot occur at the same time.

4.3.2.1. Facilitation Auction

A market participant can use the facilitation auction to enter block-size agency orders — 50 contracts for regular options — and trade against those orders as principal. The EAM that enters the order must be willing to execute the entire size of the order. Facilitation orders can be entered for all instrument types.

The facilitation auction processing cycle follows these steps:

- An EAM enters a CrossOrder at a specified limit price.
 - *AuctionType* must be set to **H** (Facilitation Auction)
- An auction is initiated. An auction message is broadcast via the MDI stating that a facilitation auction has started, describing the order being exposed. An Auction Notification message is also sent out on OTTO ports.
- Market participants can respond to the auction during the exposure period. The responses are hidden.
 - *AuctionType* must be set to H (Facilitation Auction)
 - *AuctionId* must contain a valid identifier for an ongoing Facilitation Auction
- Price improvement for simple instruments may be in ½-tick increments (but not less than a penny). Price improvement for complex instruments may be in penny increments.
- The initiating EAM cannot alter the auction order, but it can be canceled prior to the termination of the auction. Responses can also be canceled.

4.3.2.2. PIM (Price Improvement Mechanism)

The PIM is used to conduct an Auction and trade regardless if it is conducted in 1¢/5¢/10¢ increments. An EAM can use the PIM to trade against the customer order as principal. PIMs can be entered for all instrument types. There is no minimum quantity for a PIM, but The EAM must be willing to execute the entire size of the customer order.

Other market participants can compete for execution by entering response orders that improve upon the previously entered responses. The customer order is executed when the exposure period ends.

The PIM order processing cycle follows these steps:

- The EAM enters a PIM CrossOrder, specifying the size and limit price. The price can be specified in one-cent increments.
 - *AuctionType* must be set to **P** (PIM Auction)
- A Simple PIM order can be marked ISO
- An auction is initiated. An auction message is broadcast via the MDI Order feed stating that a PIM auction has started, describing the order being exposed. An Auction Notification message is also sent out on OTTO ports.
- Market participants can respond to the PIM order within the response period. The responses are hidden.
 - *AuctionType* must be set to P (PIM Auction)
 - *AuctionId* must contain a valid identifier for an ongoing PIM Auction
- Price improvement may be in penny increments.
- PIM orders cannot be canceled or modified.
- Response orders cannot be canceled but can be replaced (overwritten) by a subsequent response that improves the price and/or increases the quantity.
- The auction is terminated after the response period. It can terminate prematurely when unrelated orders are received in the same series that can cause the PIM order to lose priority.

4.3.2.3. Solicitation Auction

A Solicitation auction is an auction mechanism by which an EAM can execute orders of at least 500 contracts — by soliciting contra-orders. Solicitation auctions can be entered for all instrument types.

The solicitation auction processing cycle follows these steps:

- An EAM enters a solicitation CrossOrder at a specified limit price
 - *AuctionType* must be set to **S** (Solicitation Auction)
- An auction is initiated. An auction message is broadcast via the MDI stating that a solicitation auction has started, describing the order being exposed.
- Market participants can respond to the auction during the exposure period. The responses are hidden.
 - *AuctionType* must be set to S (Solicitation Auction)
 - *AuctionId* must contain a valid identifier for an ongoing Solicitation Auction
- Price improvement for simple instruments may be in ½-tick increments (but not less than a penny). Price improvement for complex instruments may be in penny increments.
- The submitting EAM cannot alter the auction order, but the order can be canceled prior to the termination of the auction. Responses can also be canceled.

4.3.3. Auction Step-up Price

Auction step-up is a mechanism that allows the EAM the ability to silently match, up to the step-up price, any responses that improve the auction price. The EAM may also indicate a “market price” step- up, which matches all improving responses.

A step-up price is entered by setting Price on the Contra side of a **CrossOrder** better than Price on the Primary side of the cross order. For example, if the auction order is buying at \$1.00, the initial response may sell at \$0.95. Or, if the auction order is selling at \$1.00, the initial response may buy at \$1.05.

To indicate a “market price” step-up, set *OrderType* of the Contra side of a **CrossOrder** to M(Market).

Step-up only matches the quantity required. For example, if the auction is to buy 10 @ \$1.00 with a step-up price of \$0.95, and the only other response is 1 @ \$0.98, the EAM will get 1 @ \$0.98, the response will get 1 @ \$0.98, and the EAM will get the remaining 8 @ \$1.00.

Step-up pricing may be used on Facilitation and PIM auctions, only.

4.4. Complex Orders

MRX will support the following types of complex instruments:

- **Standard Combinations:** Includes two to ten options legs within the same product
- **Stock Combinations:** Includes one underlying stock and one to nine options legs within the same product

4.4.1. Do Not Trade Through (DNTT)

Individual legs of the complex order can trade through away market prices. “Do Not Trade Through” (DNTT), allows a member to indicate on the order that it should not trade through away market leg prices. DNTT orders may be limit or market orders, and may be for any time validity and client category. DNTT orders may be modified (See section 4.2 Replace Order for details), including modifying from DNTT to non-DNTT, and vice versa.

An order marked DNTT that does not trade rests on the book (unless it is an IOC or FOK order), updating the IBBO as appropriate.

The *PriceProtection* field, on the New Order message, is used to indicate if the order can trade through the away markets. The default value is ‘L’ (Local) — the order can trade through. If set to ‘N’ (National), the order cannot trade through. *PriceProtection* field on New Cross Order message is currently ignored and Local protection is assumed.

4.5. Special Order Types

There are a number of special order types that are entered using New Order message:

- Minimum Quantity Orders (AON, FOK only)
- Preferenced Orders
- Reserve Orders
- Add Liquidity Only Orders (ALO)

4.5.1. Minimum Quantity Orders

In general, minimum quantity orders are orders that must execute a specified minimum quantity. Depending on other order attributes, orders that cannot execute the required minimum quantity are posted (hidden) to the order book or canceled.

Exchange supports two minimum quantity order types:

- All Or None (AON)
- Fill Or Kill (FOK)

4.5.1.1. All Or None (AON)

An AON order must be filled completely upon entry or the entire order is immediately canceled. Note, at this time AON orders will only be accepted as immediate or cancel (IOC) orders.

The order attempts to match with the order book upon entry. If the order is not marketable, or if it is marketable but the order book does not contain sufficient quantity to execute the entire order, the order is canceled.

- To enter an AON order:
 - Use New Order (Long Form) message
 - Set MinQty = Quantity
 - Set TIF = I(IOC)
 - Use New Order (Short Form) message
 - Set TIF = F(FOK)
- Note, MinQty will be inferred from the Quantity field

4.5.1.2. Fill or Kill (FOK)

An FOK order must be filled completely upon entry or the entire order is immediately canceled.

The order attempts to match with the order book upon entry. If the order is not marketable, or if it is marketable but the order book does not contain sufficient quantity to execute the entire order, the order is canceled.

- An FOK order can only be entered when the instrument is in a continuous trading state (“Regular”).
- To enter an FOK order:
 - Use New Order (Long Form) message
 - Set MinQty = Quantity
 - Set TIF = F(FOK)
 - Use New Order (Short Form) message
 - Set TIF = F(FOK)
- Note MinQty will be inferred from the Quantity field

4.5.2. Preferred Orders

An EAM may specify an MM to get a preferred allocation on an order.

- If an order specifies a preferred MM, and the order trades with the book at entry, and the preferred MM is present at the NBBO, the MM receives an enhanced share. If the preferred MM is not quoting at the NBBO, then preferencing has no effect even if the order trades with that MM at farther price levels.
- Specifying a preferred MM does not change priority rules or away market protection for the order being entered.
- Crossing and auction orders, except complex exposure auctions, cannot be preferred and will be rejected.
- The preferred MM is specified in the *PreferredParty* field on the New Order (Long Form) message.
- MMs do not need to make changes to their applications to receive the enhanced allocation.

4.5.3. Reserve Orders

Reserve orders are available for simple orders only and will be rejected if submitted for complex instruments. Reserve orders do not show their full size in the order book. The Quantity field is the total order size. The *DisplayQty* field is the initial displayed size. When the order trades, it automatically refreshes itself from its reserve quantity, which is the order quantity less the traded quantity. Only the displayed quantity has priority against other orders, the reserve quantity has no priority at the same price level, but it does have priority over orders at worse price levels.

Reserve orders are entered using the New Order (Long Form) message. Non-zero value of the *DisplayQty* field indicates that the order is a reserve order.

There are two methods for refreshing the quantity:

- Refresh the display quantity whenever it is fully traded out (*DisplayWhen* = E [Exhaust]).
- Refresh it after every trade (*DisplayWhen* = I [Immediate]).

There are also two choices when refreshing the quantity:

- Refresh the initial display quantity (*DisplayMethod* = "I"[Initial]).
- Randomize the displayed quantity between a minimum and a maximum supplied value (*DisplayMethod* = "R" [Random]).

4.5.4. Add Liquidity Only Orders (ALO)

An ALO is an order that is guaranteed to add liquidity ("Maker") to the order book. If the order cannot be added to the book, it is canceled, or optionally, may be re-priced to allow it to rest on the book.

For example, if an incoming ALO would lock or cross either or both of the IBBO or ABBO, a re-price ALO would be re-priced one MPV away from the locked or crossed BBO, in order to uncross the BBO(s) and rest on the book, while a cancel ALO would simply be canceled.

An order is marked Post Only by setting *ALOInst* = "Y" and will follow the firm instructions for reprice or cancel messages.

Additional information:

- ALOs can be entered for simple instruments, only.
- ALOs can only be entered when the instrument is in a continuous trading state ("Regular"). If the instrument moves out of "Regular," any resting ALOs for that instrument are canceled.
- The only allowed validity time is Day (*TIF* = D).
- The only allowed order type is Limit (*OrdType* = L).
- All client categories are allowed.
- An ALO will be exposed
- ALOs can also be marked "ISO".
- ALOs cannot be preferenced and preferred market maker settings will be ignored on incoming ALO orders
- ALOs can be canceled and modified. However, a non-ALO cannot be modified to be an ALO, and an ALO cannot be modified to be a non-ALO.
- Auction and cross orders cannot be marked ALO.

4.5.5. Opening Only Order (OPG)

An Opening only (OPG) limit order can only participate in the opening rotation and will be deleted after the opening process for simple instruments and at the end of the next opening processing for complex instruments. OPG orders will be rejected if the exchange is in a regular trading state. OPG orders submitted as market will be rejected.

An OPG order is marked OPG by setting *TIF* = "IOC" (*Immediate or Cancel*) and *Auction Type* = "O" (*Opening Auction*)" on the New Order (Short Form) and New Order (Long Form) messages.

5. Request Messages

5.1. New Order

5.1.1. New Order (Long Form)

Long form of the New Order request provides full flexibility of configuring order attributes:

- Supports Simple and Multi-leg instruments (up to 10 legs)
- Allows override of the default clearing settings for the Firm
- Supports Preferenced orders
- Supports AON, FOK orders
- Supports Reserve Orders
- Supports Attributable orders
- Supports one-sided auction initiation orders (Block and Exposure Auctions)

- Supports auction responses
- Do Not Trade Through Orders

If you send a valid order, you should receive an acknowledgement as an Order Accepted Message (Long Form).

Field	Type	Offset	Len	Details
MsgType	Alpha		1	A
FirmID	Alphanumeric		4	Firm ID (e.g. ABCD, 123A)
InstrumentId	Integer		4	Instrument ID, as specified by Option Directory notifications
ClOrdId	Alphanumeric		16	See Client Order Id
CMTA	Integer		4	CMTA
ClearingAccount	Alphanumeric		4	Sub-account/MM Identifier at the registered exchange– all four characters will be provided to OCC
OCCAccount	Integer		4	OCC # to use for clearing (give up)
CustAcct	Alphanumeric		10	Account on the customer system (pass-through)
PreferredParty	Alpha		3	IFI of the preferred Market Maker. Blank if none.
ALOInst	Alpha		1	<ul style="list-style-type: none"> • N=Not ALO • Y=ALO
ISO	Alpha		1	<ul style="list-style-type: none"> • N=Not ISO • I=ISO
Side	Alpha		1	<ul style="list-style-type: none"> • B=Buy • S=Sell
OrderType	Alpha		1	<ul style="list-style-type: none"> • L=Limit • M=Market
Price	Price		8	Limit price. Should be set to 0 if Order Type = M.
Quantity	Integer		4	Number of contracts
MinQty	Integer		4	0 or Quantity
TIF	Alpha		1	See Time in Force Field (TIF)
Capacity	Alpha		1	See Order Capacity Field
AuctionType	Alpha		1	See Auction Type Field
AuctionId	Integer		4	Identifies the Auction being responded. 0 if this order is not an auction response.
Reserved	Alpha		1	<ul style="list-style-type: none"> • " "(space)=Default This instruction is reserved and will only be accepted when blank space is provided
DisclosureMask	Integer		1	See Disclosure Mask Field
PriceProtection	Alpha		1	L=Local Market N=National Market
DisplayQty	Integer		2	Initial Display Quantity
DisplayWhen	Alpha		1	I=Immediate E=Exhaust N=N/A
DisplayMethod	Alpha		1	<ul style="list-style-type: none"> • I=Initial • R=Random • N=None
DisplayLowQty	Integer		2	If DisplayMethod = Random
DisplayHighQty	Integer		2	If DisplayMethod = Random
PositionEffectMask	Integer		2	See Position Effect Mask Field

Field	Type	Offset	Len	Details
StockLegShortSale	Alpha		1	<ul style="list-style-type: none"> • N=Not Applicable • H=Sell Short • E=Sell Short Exempt If this is a multi-leg order for a stock combo where stock leg is on the Sell side StockLegShortSale may be set to H or E. In all other cases value N should be used.
StockLegMpid	Alphanumeric		4	Give-up for the stock leg
StockCapacity	Alpha		1	P = Principal A = Agency R = Riskless Principal "(space) = Not Applicable
Reserved	Alphanumeric		1	<ul style="list-style-type: none"> • "(space)=Default This instruction is reserved and will only be accepted when blank space is provided

5.1.2. New Order (Short Form)

Short format of the New Order request is a compact message (less than 50 bytes) with limited flexibility:

- Supports Simple and Multi-leg instruments
- Order Quantity has a maximum of 65535. For order quantities greater than 65535, New Order (Long Form) must be used.
- Supports auction responses
- Default clearing configuration for the Firm is used

If you send a valid order, you should receive an acknowledgement as an Order Accepted Message (Short Form).

Field	Type	Offset	Len	Details
MsgType	Alpha		1	B
FirmID	Alphanumeric		4	Firm ID (e.g. ABCD, 123A)
InstrumentId	Integer		4	Instrument ID, as specified by Option Directory notifications
ClOrdId	Alphanumeric		16	See Client Order Id
ALOInst	Alpha		1	<ul style="list-style-type: none"> • N=Not ALO • Y=ALO
ISO	Alpha		1	<ul style="list-style-type: none"> • N=Not ISO • I=ISO
Side	Alpha		1	<ul style="list-style-type: none"> • B=Buy • S=Sell
OrderType	Alpha		1	<ul style="list-style-type: none"> • L=Limit • M=Market
Price	Price		8	Limit price. Should be set to 0 if Order Type = M.
Quantity	Integer		2	Number of contracts
TIF	Alpha		1	See Time in Force Field (TIF)
Capacity	Alpha		1	See Order Capacity Field
AuctionType	Alpha		1	See Auction Type Field
AuctionId	Integer		4	Identifies the Auction being responded. 0 if this order is not an auction response.

Field	Type	Offset	Len	Details
PriceProtection	Alpha		1	<ul style="list-style-type: none"> L=Local Market N=National Market
PositionEffectMask	Integer		2	See Position Effect Mask Field
StockCapacity	Alpha		1	<ul style="list-style-type: none"> P = Principal A = Agency R = Riskless Principal " "(space) = Not Applicable

5.2. Replace Order

Replace Order message is used to modify an existing order for both simple and complex instruments. It can also be used to alter price of the contra side of Cross Orders.

- The order to be replaced is identified by *OrigClOrdId*
- FirmID* of the original order cannot be modified. If the original order was entered with a different *FirmID*, request is rejected.
- All the attributes of the original order are preserved unless specifically modified via this message.
- A replacement order where the only change to the original is reduction in Order Quantity or a change in *TIF* preserves the time priority of the original order. Any other modification results in new time priority being assigned.
- On NOM only, if the replace order fails matching engine level validations (Fat Finger, NBBO checks, LULD, etc.) the original order attempting to be replaced will be cancelled and there will not be an acknowledgement or reject sent for the cancel replace attempt.

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

- If the order for the specified *OrigClOrdId* is no longer live or if the replacement *ClOrdId* is already used by an open order, the replacement will be rejected.
- If the order for the *OrigClOrdId* is live but the details of the replace are invalid order will be canceled.
- If the order for the *OrigClOrdId* is live and can be replaced, you will receive an Order Replaced message.
- If the order for the *OrigClOrdId* is in a paused state and cannot be replaced, you will receive a
- Pending Response message.
 - Note, there can only be one pending response during a paused state and additional replace requests will be rejected

Field	Type	Offset	Len	Details
MsgType	Alpha		1	R
FirmID	Alphanumeric		4	Firm ID (e.g. ABCD, 123A)
OrigClOrdId	Alphanumeric		16	Client Order Identifier of the order to be replaced. If no open order with such identifier is found, request is rejected.
ClOrdId			16	Client Order Identifier for the replacement order. See Client Order Id.
Quantity	Integer		4	"Total Intended Order Quantity" (including the amount already executed for this chain of orders)
OrderType	Alpha		1	<ul style="list-style-type: none"> L=Limit M=Market
Price	Price		8	
TIF	Alpha		1	See Time in Force Field (TIF)
CustAcct	Alphanumeric		10	Account on the customer system (pass-through)

Field	Type	Offset	Len	Details
PriceProtection	Alpha		1	<ul style="list-style-type: none"> L=Local N=National

5.3. Cancel Order

This message is used to:

- Delete single simple order
- Delete single complex order
- Delete a Cross Order, thus terminating an ongoing simple or complex auction

Exchange may respond to this message in one of the following ways:

- If the order cannot be deleted at the time, but the cancel request is queued, a Pending Response is returned.
- If cancel request is invalid a Reject message is sent
- Otherwise, an Order Canceled message is sent to notify that the order has been deleted.

5.3.1. Cancel Order by Client ID

The order to be deleted is identified by the ClOrdId field. If the order cannot be deleted, or cannot be found, the request is rejected.

Field	Type	Offset	Len	Details
MsgType	Alpha		1	C
FirmID	Alphanumeric		4	Firm ID (e.g. ABCD, 123A)
ClOrdId	Alphanumeric		16	Client Order Identifier of the order to be canceled. If no open order with such identifier is found, request is rejected.

5.4. Mass Cancel

This message is used to mass-delete multiple open orders based on the specified Scope.

- If message contains invalid fields request is rejected.
- If there are no open orders associated with the OTTO account that match specified criteria Mass Cancel Response is sent immediately.
- Otherwise, a valid Mass Cancel request results in a sequence of Order Canceled outbound messages per order being sent out. If an order matching mass cancel criteria cannot be deleted at the time, but the cancel request is queued, a Pending Response per order is sent out. The sequence is terminated with a single Mass Cancel Response message containing counters summarizing the action taken.
- Mass Cancel will only apply to orders on the initiating port associated with the OTTO account that sent the request.

Field	Type	Offset	Len	Details
MsgType	Alpha		1	U
FirmID	Alphanumeric		4	Firm ID (e.g. ABCD, 123A)
ClRequestId	Alphanumeric		16	Client's identifier of the request. It is echoed back with either Mass Cancel Response or Reject
InstrumentType	Alpha		1	<ul style="list-style-type: none"> A=All O=Simple Instrument C=Standard Combination S=Stock Combination

Field	Type	Offset	Len	Details
Scope	Alpha		1	Scope of the deletion request: <ul style="list-style-type: none"> • P=Product – Cancel all open orders for the specified <i>FirmID/ProductID/InstrumentType</i> (requires <i>ProductID</i>). <i>InstrumentID</i> must be set to 0. • I=Instrument – Cancel all the open orders for the specified <i>FirmID/InstrumentID</i> (requires <i>InstrumentID</i>). <i>ProductID</i> must be set to 0. • F=Firm – Cancel all open orders for the specified <i>FirmID/InstrumentType</i>. <i>ProductID</i> and <i>InstrumentID</i> must be set to zero(0).
ProductID	Integer		2	Product (Underlying) ID, as specified by Option Directory notifications. Must be populated if Scope=P and <i>UnderlyingSymbol</i> not populated.
InstrumentID	Integer		4	Instrument ID, as specified by Option Directory notifications. Must be populated if Scope=I
UnderlyingSymbol	Alpha		13	Denotes the unique underlying stock symbol for the option symbol. Must be populated if Scope = P and <i>ProductID</i> not populated.

5.5. New Cross Order

Cross Order message allows specifying two opposite sides to trade against each other. The primary side of the order is exposed in an auction if *CrossType* is set to A (Auction). Other cross types (QCC and CCC) trade the two sides without market exposure.

- This message is used for both simple and complex instruments
- Successful submission of a New Cross Order will result in a Cross Order Accepted message.
- *CIOrdId* of the contra side of the cross order cannot be the same as *CIOrdId* of the primary side.
- Cross Order that initiates an auction can be canceled (for cross orders functionality allowed to be cancelled) which in turn terminates the auction. To cancel an ongoing auction use *CancelOrder* message with *CIOrdId* of the primary side of the cross order. Attempt to cancel a cross order using *CIOrdId* of the contra side is rejected.
- Price of the contra side of an auction Cross Order can be changed using *ReplaceOrder* message for PIM and complex PIM only. This message must contain *OrigCIOrdId* that is equal to *CIOrdId* of the contra side of the Cross Order.
- When submitting a Simple QCC order, the minimum order quantity is 1,000 for regular options. There is no minimum quantity requirement for a CCC order.
- When submitting a Complex QCC order, the minimum order quantity is 1000, validated at the total complex order quantity and the lowest leg ratio quantity levels.
- Note, QCC orders will not be supported on *OTTO* at this time and rejected if *CrossType*="Q"

Field	Type	Offset	Len	Details
MsgType	Alpha		1	X
FirmID	Alphanumeric		4	Firm ID (e.g. ABCD, 123A)
InstrumentID	Integer		4	Instrument ID, as specified by Instrument Directory Messages
CrossType	Alpha		1	<ul style="list-style-type: none"> • A=Auction • Q=QCC • C=CCC
AuctionType	Alpha		1	See Auction Type Field If <i>CrossType</i> is set to A, acceptable values are P,H,S For other <i>CrossTypes</i> value N must be used
AuctionAllocPct	Integer		1	Order Allocation percentage 0 <= n <= 40. 0 for Simple and Complex Solicitation.

Field	Type	Offset	Len	Details
Side	Alpha		1	Side of the primary part of the Cross Order. Contra part is implied to be on the opposite side. <ul style="list-style-type: none"> • B=Buy • S=Sell
ISO	Alpha		1	<ul style="list-style-type: none"> • N=Not ISO • I=ISO
PriceProtection	Alpha		1	<ul style="list-style-type: none"> • L=Local • N=National
EffectiveTime	Integer		8	Agreed upon time for the stopped price. UTC time in milliseconds.
DisclosureMask	Integer		1	See Disclosure Mask Field
Primary Side				
CIOrdId	Alphanumeric		16	See Client Order Id
CMTA	Integer		4	CMTA
ClearingAccount	Alphanumeric		4	Sub-account/MM Identifier at the registered exchange – all four characters will be provided to OCC
OCCAccount	Integer		4	OCC # to use for clearing (give up)
CustAcct	Alphanumeric		10	Account on the customer system (pass-through)
Price	Price		8	Limit price. Primary Side of a Cross order cannot be Market.
Quantity	Integer		4	Number of contracts
Capacity	Alpha		1	See Order Capacity Field
PositionEffectMask	Integer		2	See Position Effect Mask Field
StockLegShortSale	Alpha		1	<ul style="list-style-type: none"> • N=Not Applicable • H=Sell Short • E=Sell Short Exempt If this is a multi-leg order for a stock combo where stock leg is to sell <i>StockLegShortSale</i> may be set to H or E. In all other cases value N should be used.
StockLegMpid	Alphanumeric		4	Give-up for the stock leg
StockCapacity	Alpha		1	<ul style="list-style-type: none"> • P = Principal • A = Agency • R = Riskless Principal • " "(space) = Not Applicable
Contra Side				
CIOrdId	Alphanumeric		16	See Client Order Id
CMTA	Integer		4	CMTA
ClearingAccount	Alphanumeric		4	Sub-account/MM Identifier at the registered exchange – all four characters will be provided to OCC
OCCAccount	Integer		4	OCC # to use for clearing (give up)
CustAcct	Alphanumeric		10	Account on the customer system (pass-through)
OrderType	Alpha		1	<ul style="list-style-type: none"> • L=Limit • M=Market
Price	Price		8	Limit price. Should be set to 0 if Order Type = M.
Quantity	Integer		4	Number of contracts

Field	Type	Offset	Len	Details
Capacity	Alpha		1	See Order Capacity Field
PositionEffectMask	Integer		2	See Position Effect Mask Field
StockLegShortSale	Alpha		1	<ul style="list-style-type: none"> • N=Not Applicable • H=Sell Short • E=Sell Short Exempt If this is a multi-leg order for a stock combo where stock leg is on the Sell side <i>StockLegShortSale</i> may be set to H or E. In all other cases value N should be used.
StockLegMpid	Alphanumeric		4	Give-up for the stock leg <ul style="list-style-type: none"> • P = Principal • A = Agency • R = Riskless Principal • " "(space) = Not Applicable
StockCapacity	Alpha		1	<ul style="list-style-type: none"> • P = Principal • A = Agency • R = Riskless Principal • " "(space) = Not Applicable

5.6. Add Complex Instrument

This is a variable length message where length is controlled by the number of legs in the instrument.

- If all the fields in the message are valid and the complex strategy already exists the participant receives Add Complex Instrument Response followed by Complex Strategy Directory messages.
- If all the fields in the message are valid and the complex strategy does not exist the participant receives Complex Strategy Directory followed by Add Complex Instrument Response messages.
- In all other cases the request is rejected.

Field	Type	Offset	Len	Details
MsgType	Alpha		1	S
FirmID	Alphanumeric		4	Firm ID (e.g. ABCD, 123A)
ClRequestId	Alphanumeric		16	Client's identifier of the request. It is echoed back with either Add Complex Instrument Response or Reject
ProductID	Integer		2	Product (Underlying) ID, as specified by Option Directory notifications; must be provided if ProductName is blank
ProductName	Alphanumeric		13	Product (Underlying) name; must be provided if ProductID = 0
NumLegs	Integer		1	Number of legs (2-10)
Leg Definitions (2-10)				
• LegType	Alpha		1	<ul style="list-style-type: none"> • O=Option • S=Stock
• LegInstrumentID	Integer		4	Instrument ID, as specified by Simple Option Directory notifications. Use 0 for a Stock Leg.
• LegSide	Alpha		1	<ul style="list-style-type: none"> • B=Buy • S=Sell
• LegRatio	Integer		2	1 <= n <= 9,999

5.7. Modify Trade

The Modify Trade request is used to change clearing information on an existing trade as well as split a trade into multiple components with different clearing assignments.

A single trade can be broken up into multiple allocations, but the sum total quantity must equal the original trade quantity. Only the current business day's trades can be adjusted.

The trade to be changed is identified by the *MatchID* field. This field is made available by the Trade Details message.

- A valid Modify Trade request is acknowledged by OTTO via Modify Trade Response message.
- Once processed by the Exchange's trade management subsystem, OTTO will send out Trade Details message(s) resulting from the requested modification.
- If request is deemed invalid a Reject message will be sent.
- A Modify Trade request can be sent from a different OTTO session than the session that originated the order. The *FirmID* will be validated prior to accepting the Modify Trade request.
- Note, *Capacity* cannot be changed from Customer to Firm and Modify Trade requests with this change will be rejected
- *OCCAccount* is required on every Modify Trade request and requests will be rejected if not included. It is not required for the stock legs and will be ignored.
- CMTA, ClearingAccount, & CustAccount will not be carried forward from the original execution. Os or Blanks in these fields on Modify Trade request will remove these fields when passing the allocation request to the *OCCCapacity* and *OpenClose* Mask will be carried forward from the original execution if not provided in the Modify Trade Request
- If both *OCCAccount* and *StockLegMpid* are provided then the request will be rejected.
- If both *Capacity* and *StockCapacity* are provided then the request will be rejected.

Field	Type	Offset	Len	Details
MsgType	Alpha		1	M
FirmID	Alphanumeric		4	Firm ID (e.g. ABCD, 123A)
InstrumentID	Integer		4	Instrument ID, as specified by Option Directory notifications
CIRequestId	Alphanumeric		16	Client's identifier of the request. It is echoed back with either Modify Trade Response or Reject
CIOrdId	Alphanumeric		16	Identifies Order whose execution is being modified
CrossId	Integer		4	<i>CrossId</i> of the trade being modified
MatchId	Integer		4	<i>MatchId</i> of the trade to be modified
Side	Alpha		1	Side where modifications are to be made
Quantity	Integer		4	Size of the trade being split
NumSplits	Integer		2	Number of parties this trade is being split into (1 <= n <= 10)
Trade Splits [1..10]				
AllocQty	Integer		4	Quantity being allocated to the specified clearing configuration
CMTA	Integer		4	CMTA (0=remove)
ClearingAccount	Alphanumeric		4	Sub-account/MM Identifier at the registered exchange (blanks=remove) – all four characters will be provided to OCC.
OCCAccount	Integer		4	OCC # to use for clearing (give up)
CustAcct	Alphanumeric		10	Account on the customer system (pass-
StockLegMpid	Alphanumeric		4	Give-up for the stock leg Required
Capacity	Alpha		1	See Order Capacity Field
OpenClose	Alpha		1	<ul style="list-style-type: none"> • Open = "O" • Closed = "C" • Carry Forward = Blank Space
StockCapacity	Alpha		1	<ul style="list-style-type: none"> • P = Principal • A = Agency • R = Riskless Principal • " "(space) = Not Applicable

5.8. Member Kill Switch Request

The **Member Kill Switch Request** is used to block ability to enter new orders, alter existing orders, delete orders, and create complex instruments on MRX. OTTO Accounts can send a Member Kill Switch Request.

Note, a Member Kill Switch Request will delete SQF Sweeps, Auction orders and auction responses entered for the same Firm ID over SQF. Quotes will not be deleted and quoting functionality will not be blocked. Member Kill Switch Request on NOM will not impact SQF Sweeps, Auction orders, auctions responses or quotes at this time. Scope of the Kill Switch Request is one firm per request.

Exchange may respond to Member Kill Switch Request in one of the following ways:

- If Member Kill Switch Request is invalid a Reject message is sent
- Otherwise, a Member Kill Switch Notification is sent

Field	Type	Offset	Len	Details
MsgType	Alpha		1	K
FirmID	Alphanumeric		4	Firm ID issuing the request
ClRequestId	Alphanumeric		16	Client's identifier of the request.
TargetFirmID	Alphanumeric		4	Firm ID being targeted by the Kill Switch Request
KillAction	Alpha		1	<ul style="list-style-type: none">• A=Block Entry of new requests and delete all open orders

5.9. Subscription Request

OTTO protocol specifies a number of notification message types that can be sent to the client optionally. By default, all notification types are sent out. Subscription Request message allows client to modify the set of notification types it receives on the OTTO connection. Modification made via Subscription Request Message is only applicable to the current session. Client should re-issue Subscription Request at the beginning of every trading session if full set of notification types is not desired.

Subscription Requests are supported on MRX and GEMX

- Subscription Request only modifies the types of notifications being delivered regardless of the instrument and/or badge of the messages.
- Effects of the Subscription Request are immediate, but not retroactive. Notifications that were not included prior to the subscription change will not be delivered

Exchange may respond to Subscription Request in one of the following ways:

- If Subscription Request is invalid a Reject message is sent
- Otherwise, a Subscription Response is sent

Field	Type	Offset	Len	Details
MsgType	Alpha		1	F
FirmID	Alphanumeric		4	Firm ID issuing the request
ClRequestId	Alphanumeric		16	Client's identifier of the request.
Subscription	Alpha		16	<p>A list of notification types to be included in the current session. This field can contain 0 or more types and should be padded with spaces on the right.</p> <ul style="list-style-type: none">• S=Simple Instrument Directory• s=Complex Instrument Directory• H=Instrument Trading Action• A=Auction Notification• T=Trade Details (only for the OTTO connection the subscription request was sent)

6. Notification Messages

Notification Messages are sent by OTTO either in response to participant Requests or as a result of market activity.

6.1. System Event Message

System Event message informs of a market or a session-level event.

Field	Type	Offset	Len	Details
MsgType	Alpha		1	z
Timestamp	Integer		8	Nanoseconds since midnight
EventCode	Alpha		1	See System Event Codes

6.2. Instrument Directory Messages

6.2.1. Simple Instrument Directory

At the start of each trading day and during intra-day market state changes, the system disseminates directory messages for all symbols trading on the system.

Field	Type	Offset	Len	Details
MsgType	Alpha		1	o
Timestamp	Integer		8	Nanoseconds since midnight
ProductId	Integer		2	Product (Underlying) ID
ProductName	Alphanumeric		13	Product (Underlying) name
InstrumentId	Integer		4	Instrument (Option) ID
ExpirYear	Integer		1	Expiration Year (less 2000)
ExpirMon	Integer		1	Expiration Month (1-12)
ExpirDay	Integer		1	Expiration Day (1-31)
StrikePrice	Price		8	Strike Price
OptionType	Alpha		1	<ul style="list-style-type: none">• C=Call• P=Put
ClosingType	Alpha		1	<ul style="list-style-type: none">• N=Normal Hours• L=Late Hours• W=WCO Early Closing at 12:00 Noon
Tradable	Alpha		1	<ul style="list-style-type: none">• Y=Tradable• N=Not Tradable
Closing Only	Alpha		1	<ul style="list-style-type: none">• N=Unrestricted Y= Option is Closing Position Only. Only MM origin orders can have open position in the series
Contract Size	Integer		2	Underlying Deliverable size
MPV	Alpha		1	<ul style="list-style-type: none">• E=Penny Everywhere• S=Scaled• P=Penny Pilot
SystemPartition	Integer		1	For future use
Security Symbol	Alphanumeric		5	Industry assigned security symbol for the option contract

6.2.2. Complex Instrument Directory

This message is sent whenever new complex strategy is created on the system.

- *InstrumentId* of a complex strategy is unique for the trading day across both simple and complex instruments. Complex strategies persisting from day to day could have a different *InstrumentID*.
- This message may be a response to the Add Complex Instrument request or result from Complex Strategy being created on the system by any other activity.

Field	Type	Offset	Len	Details
MsgType	Alpha		1	s
Timestamp	Integer		8	Nanoseconds since midnight
ProductId	Integer		2	Product (Underlying) ID
ProductName	Alphanumeric		13	Product (Underlying) name
InstrumentId	Integer		4	Instrument (Strategy) ID
NumLegs	Integer		1	Number of legs (2-10)
Leg Definitions (2-10)				
LegType	Alpha		1	<ul style="list-style-type: none"> • O=Option • S=Stock
LegInstrumentId	Integer		4	Instrument ID, as specified by Simple Option Directory notifications. 0 for a Stock Leg.
LegSide	Alpha		1	B=Buy S=Sell
LegRatio	Integer		2	1 <= n <= 9,999
LegId	Integer		1	Leg identifier within this strategy. This is an exchange-assigned 0-based index. E.g. Nth leg has LegId=N-1.

6.3. Instrument Trading Action Message

This message notifies of changes to the trading status of an instrument.

Field	Type	Offset	Len	Details
MsgType	Alpha		1	i
Timestamp	Integer		8	Nanoseconds since midnight
ProductId	Integer		2	Product (Underlying) ID
InstrumentId	Integer		4	Instrument (Option) ID
TradingState	Alpha		1	<ul style="list-style-type: none"> • H=Halted • T=Trading. Note, at the start of day all instruments are assumed to be Trading unless notified as Halted by this message.

6.4. Auction Notification

Auction Notification message announces that a new Auction has started in the market for Nasdaq MRX or GEMX. Auctions orders include Block, Complex Exposure, Simple Exposed order, Facilitation, Solicitation, and PIM.

- Used for simple, complex and stock combo instruments, as specified by *InstrumentType* field.

Field	Type	Offset	Len	Details
MsgType	Alpha		1	n
Timestamp	Integer		8	Nanoseconds since midnight
InstrumentType	Alpha		1	<ul style="list-style-type: none"> • O=Simple Instrument • C=Standard Combination • S=Stock Combination
InstrumentId	Integer		4	Instrument ID, as specified by Instrument Directory notifications

Field	Type	Offset	Len	Details
AuctionId	Integer		4	Identifies new Auction. AuctionId is unique across all instruments for the duration of the trading session.
Order Type	Alpha		1	<ul style="list-style-type: none"> L=Limit M=Market N=Not Disclosed
Side	Alpha		1	<ul style="list-style-type: none"> B=Bid O=Offer N=Not Disclosed
Price	Price		8	Price/Premium. 0 if price is Not Disclosed or a Market order.
Quantity	Integer		4	Quantity. 0 if volume is not disclosed.
ExecFlag	Alpha		1	<ul style="list-style-type: none"> 0 = None 1 = AON
Order Capacity	Alpha		1	See Order Capacity Field
FirmID	Alphanumeric		4	Spaces when auction not flagged Attributable
OCCAccount	Integer		4	Account number used for clearing give up. 0 when auction not flagged Attributable
CMTA	Integer		4	0 when auction not flagged Attributable
AuctionEvent	Alpha		1	<ul style="list-style-type: none"> S=Start U=Auction Update E=End of Auction
AuctionType	Alpha		1	See Auction Type Field
BestResponsePrice	Price		8	Best response price; 0 if not disclosed. Note, BestResponsePrice of 0 is valid for Exposure auctions if BestResponseSize is not 0
BestResponseSize	Integer		4	Aggregated quantity at Best response price; 0 if not disclosed

6.5. Order Accepted

These two message types acknowledge the receipt and acceptance of a valid New Order Message. The data fields from the **New Order Message** are echoed back in these messages.

Order Accepted messages always come before any Order Executed or Order Canceled Messages for an order.

6.5.1. Order Accepted (Long Form)

This message is used to acknowledge a valid order submitted via New Order (Long Form).

Field	Type	Offset	Len	Details
MsgType	Alpha		1	a
Timestamp	Integer		8	Nanoseconds since midnight
FirmID	Alphanumeric		4	Firm ID (e.g. ABCD, 123A)
InstrumentId	Integer		4	Instrument ID, as specified by Option Directory notifications
OrderId	Integer		8	Day-unique Order identifier assigned by exchange
ClOrdId	Alphanumeric		16	Client Order Identifier
CMTA	Integer		4	CMTA
ClearingAccount	Alphanumeric		4	Sub-account/MM Identifier at the registered exchange
OCCAccount	Integer		4	OCC # to use for clearing (give up)
CustAcct	Alphanumeric		10	Account on the customer system (pass-through)
PreferredParty	Alpha		3	IFI of the preferred Market Maker. Blank if none.

Field	Type	Offset	Len	Details
ALOInst	Alpha		1	<ul style="list-style-type: none"> N=Not ALO Y=ALO
ISO	Alpha		1	<ul style="list-style-type: none"> N=Not ISO I=ISO
Side	Alpha		1	<ul style="list-style-type: none"> B=Buy S=Sell
OrderType	Alpha		1	<ul style="list-style-type: none"> L=Limit M=Market
Price	Price		8	Price order accepted at
Quantity	Integer		4	Number of contracts accepted
MinQty	Integer		4	0 or Quantity
TIF	Alpha		1	See Time in Force Field (TIF)
Capacity	Alpha		1	See Order Capacity Field
AuctionType	Alpha		1	See Auction Type Field
AuctionId	Integer		4	Identifies the Auction being responded. 0 if this order is not an auction response.
Reserved	Alpha		1	“(space)=Default
DisclosureMask	Integer		1	See Disclosure Mask Field
PriceProtection			1	<ul style="list-style-type: none"> L=Local Market N=National Market
DisplayQty	Integer		2	Initial Display Quantity
DisplayWhen	Alpha		1	<ul style="list-style-type: none"> I=Immediate E=Exhaust N=N/A
DisplayMethod	Alpha		1	<ul style="list-style-type: none"> I=Initial R=Random N=None
DisplayLowQty	Integer		2	If DisplayMethod = Random
DisplayHighQty	Integer		2	If DisplayMethod = Random
PositionEffectMask	Integer		2	See Position Effect Mask Field
StockLegShortSale	Alpha		1	<ul style="list-style-type: none"> N=Not Applicable H=Sell Short E=Sell Short Exempt
StockLegMpid	Alphanumeric		4	Give-up for the stock leg
Reserved	Alpha		1	<ul style="list-style-type: none"> “(space)=Default This instruction is reserved and will only be accepted when blank space is provided

6.5.2. Order Accepted (Short Form)

This message is used to acknowledge a valid order submitted via New Order (Short Form).

Field	Type	Offset	Len	Details
MsgType	Alpha		1	b
Timestamp	Integer		8	Nanoseconds since midnight
FirmID	Alphanumeric		4	Firm ID (e.g. ABCD, 123A)
InstrumentId	Integer		4	Instrument ID, as specified by Option Directory notifications

Field	Type	Offset	Len	Details
OrderId	Integer		8	Day-unique Order identifier assigned by exchange
ClOrdId	Alphanumeric		16	See Client Order Id
ALInst	Alpha		1	<ul style="list-style-type: none"> N=Not ALO Y=ALO
ISO	Alpha		1	<ul style="list-style-type: none"> N=Not ISO I=ISO
Side	Alpha		1	<ul style="list-style-type: none"> B=Buy S=Sell
OrderType	Alpha		1	<ul style="list-style-type: none"> L=Limit M=Market
Price	Price		8	Price order accepted at
Quantity	Integer		2	Number of contracts accepted
TIF	Alpha		1	See Time in Force Field (TIF)
Capacity	Alpha		1	See Order Capacity Field
AuctionType	Alpha		1	See Auction Type Field
AuctionId	Integer		4	Identifies the Auction being responded. 0 if this order is not an auction response.
PriceProtection	Alpha		1	<ul style="list-style-type: none"> L=Local N=National
PositionEffectMask	Integer		2	See Position Effect Mask Field

6.6. Order Replaced

This message acknowledges the receipt and acceptance of a valid Replace Order Message. Like Order Accepted Message, Order Replaced Message always comes before any Order Executed Messages or Order Canceled Messages for the replacement.

Field	Type	Offset	Len	Details
MsgType	Alpha		1	r
Timestamp	Integer		8	Nanoseconds since midnight
FirmID	Alphanumeric		4	Firm ID (e.g. ABCD, 123A)
InstrumentId	Integer		4	Instrument ID, as specified by Option Directory notifications
OrigOrderId	Integer		8	Exchange ID of the replaced order
OrderId	Integer		8	Exchange ID of the replacement order
OrigClOrdId	Alphanumeric		16	Client Order Identifier of the replaced order
ClOrdId			16	Client Order Identifier of the replacement order
ALInst	Alpha		1	<ul style="list-style-type: none"> N=Not ALO Y=ALO
ISO	Alpha		1	<ul style="list-style-type: none"> N=Not ISO I=ISO
Side	Alpha		1	<ul style="list-style-type: none"> B=Buy S=Sell
OrderType	Alpha		1	<ul style="list-style-type: none"> L=Limit M=Market
Price	Price		8	Price replacement accepted at
Quantity	Integer		4	Number of open contracts after replacement

Field	Type	Offset	Len	Details
TIF	Alpha		1	See Time in Force Field (TIF)
CustAcct	Alphanumeric		10	Account on the customer system (pass-through)
Capacity	Alpha		1	See Order Capacity Field
AuctionType	Alpha		1	See Auction Type Field
AuctionId	Integer		4	Identifies the Auction being responded. 0 if this order is not an auction response.
PositionEffectMask	Integer		2	See Position Effect Mask Field
PriceProtection	Alpha		1	L=Local N=National

6.7. Order Canceled

An **Order Canceled** Message informs you that an order has been fully canceled. This could be acknowledging a Cancel Order Message, or it could be the result of the order being canceled automatically by the system.

Field	Type	Offset	Len	Details
MsgType	Alpha		1	c
Timestamp	Integer		8	Nanoseconds since midnight
FirmID	Alphanumeric		4	Firm ID (e.g. ABCD, 123A)
InstrumentId	Integer		4	Instrument ID, as specified by Option Directory notifications
OrderId	Integer		8	Exchange ID of the canceled order
ClOrdId			16	Client Order Identifier of the canceled order
CancelReason	Alpha		1	See Cancel Reason

6.8. Order Executed

Order Executed Message informs you that all or part of an order has been executed. This message is used for simple as well as complex instruments. It is also used to inform of cross order executions.

Order Executed is a lightweight message that contains minimal information necessary to compute status of an order as well as Firm's position in the instrument. This message is sent out in real-time as soon as execution is created by the matching engine. A more detailed Trade Details message is sent out with a small delay (sub 50 microseconds); this message contains all the info included in Order Executed plus all the clearing information.

When an order for simple instrument executes a single execution message is sent:

- **Order Executed** message for the simple instrument:
 - *OrdExecType* will be set to A
 - *InstrumentId* contains identifier of the simple instrument
 - *LegInstrumentId* is zero(0).
 - *LegId* is zero(0).

When a complex order executes the following execution messages are sent out:

- **Order Executed** message for each leg of the instrument:
 - *OrdExecType* is set to C or D
 - *InstrumentId* contains identifier of the complex instrument.
 - *LegInstrumentId* contains leg option instrument ID or 0 for stock leg.
 - *LegId* contains leg index within the complex strategy it belongs to (0-based)

- **Order Executed** message for the complex instrument:
 - *OrdExecType* will be set to B (combo).
 - *InstrumentId* contains identifier of the complex instrument.
 - *LegInstrumentId* is zero(0).
 - *LegId* is zero(0).

Field	Type	Offset	Len	Details
MsgType	Alpha		1	e
Timestamp	Integer		8	Nanoseconds since midnight
FirmID	Alphanumeric		4	Firm ID (e.g. ABCD, 123A)
ProductId	Integer		2	Product (Underlying) ID
OrdExecType	Alpha		1	Type of the execution being reported: <ul style="list-style-type: none"> • A=Execution of an order for a simple instrument (option) • B=Execution of an order for a complex instrument • C=Execution of an option leg of a complex order • D=Execution of a stock leg of a complex order
InstrumentId	Integer		4	Instrument ID, as specified by Instrument Directory notifications. Identifies a Combo Instrument if <i>OrdExecType</i> is B,C or D.
LegInstrumentId	Integer		4	Leg Instrument ID. Only populated for <i>OrdExecType</i> =C. Zero otherwise.
LegId	Integer		1	0-based <i>LegId</i> within complex instrument identified by the <i>InstrumentId</i> field. Only meaningful for <i>OrdExecType</i> C or D.
AuctionType	Alpha		1	See Auction Type Field
OrderId	Integer		8	Exchange ID of the executed order
ClOrdId			16	Client Order Identifier of the executed order
CrossId	Integer		4	An order that matches against one or more opposing orders or quotes generates a cross for each price level executed. <i>CrossId</i> is unique for the day within entire trading system.
MatchId	Integer		4	Cross consists of one or more execution pairs. Each side of such a pair carries a unique <i>MatchId</i> .
Side	Alpha		1	<ul style="list-style-type: none"> • B=Bought • S=Sold
StockLegShortSale	Alpha		1	<ul style="list-style-type: none"> • N=Not Applicable • H=Sold Short • E=Sold Short Exempt
Price	Price		8	Execution Price
Quantity	Integer		4	Number of contracts executed
LiquidityInd	Integer		1	See Liquidity (Maker/Taker) Field Codes

6.9. Trade Details

A **Trade Details** message contains additional details, specifically clearing information. This message is sent out with a nominal delay after **Order Executed** message.

- An order that matches against one or more opposing orders or quotes generates a *CrossId* and Trade Details Notification for each price level executed.
- Cross consists of one or more execution pairs. Each side of such pair carries a unique *MatchId*
- Trade Busts and/or Adjustments are made against individual *MatchIds*.

- OTTO Provides ability to modify clearing information of a trade or split a trade among multiple clearing parties via Modify Trade request.
- In case of a Complex Exposure, the Auction Type field will show 'N' for the order that initiated the exposure and it will show 'E' for the side which executed against the exposure auction.
- When a trade is modified using Modify Trade request participants will receive the following messages:
 - Trade Details message with *TransType*=B for the original trade that has been modified, including busts by Market Operations
 - Trade Details message with *TransType*=B for the original trade that has been split
 - One or more Trade Details messages with *TransType*=C for the new trades that the original trade has been modified/ split info. These messages will contain *RefMatchId* that is equal to the *MatchId* of the original trade.
- Note for complex instruments **Side** will represent the effective side of the leg, not the side of the complex order

Field	Type	Offset	Len	Details
MsgType	Alpha		1	t
Timestamp	Integer		8	Nanoseconds since midnight
FirmID	Alphanumeric		4	Firm ID (e.g. ABCD, 123A)
ProductId	Integer		2	Product (Underlying) ID
OrdExecType	Alpha		1	Type of the execution being reported: <ul style="list-style-type: none"> • A=Execution of an order for a simple instrument (option) • C=Execution of an option leg of a complex order • D=Execution of a stock leg of a complex order
InstrumentId	Integer		4	Instrument ID, as specified by Instrument Directory notifications. Identifies a Combo Instrument if <i>OrdExecType</i> is C or D.
LegInstrumentId	Integer		4	Leg Instrument ID. Only populated for <i>OrdExecType</i> =C. Zero otherwise.
LegId	Integer		1	Only meaningful for <i>OrdExecType</i> C or D. Identifies leg within complex strategy.
TransType	Alpha		1	<ul style="list-style-type: none"> • A=New Trade • B=Trade Busted • C=Modified Trade
EventSource	Alpha		1	<ul style="list-style-type: none"> • A=Matching Engine • M=Manual Trade Entry • U=Trade Modification (user) • C=Trade Modification (contra-side user) • E=Trade Modification (exchange) • B=Trade Bust (exchange)
AuctionType	Alpha		1	See Auction Type Field
OrderId	Integer		8	Exchange ID of the executed order
ClOrdId	Alphanumeric		16	Client Order Identifier of the executed order
CrossId	Integer		4	An order that matches against one or more opposing orders or quotes generates a cross for each price level executed. <i>CrossId</i> is unique for the day within entire trading system.
MatchId	Integer		4	Cross consists of one or more execution pairs. Each side of such a pair carries a unique <i>MatchId</i> .

Field	Type	Offset	Len	Details
RefMatchId	Integer		4	For TransType=C indicates MatchId of the original trade. 0(zero) for TransType=A,B
Side	Alpha		1	<ul style="list-style-type: none"> • B=Bought • S=Sold
StockLegShortSale	Alpha		1	<ul style="list-style-type: none"> • N=Not Applicable • H=Sold Short • E=Sold Short Exempt
Price	Price		8	Execution Price
Quantity	Integer		4	Number of contracts executed
LiquidityInd	Integer		1	See Liquidity (Maker/Taker) Field Codes
CMTA	Integer		4	CMTA
ClearingAccount	Alphanumeric		4	Sub-account/MM Identifier at the registered exchange
OCCAccount	Integer		4	OCC# to use for clearing (give up)
CustAcct	Alphanumeric		10	Account on the customer system (pass-through)
StockVenue	Alpha		1	See Stock Execution Venues
StockLegMpid	Alphanumeric		4	Give-up for the stock leg
Capacity	Alpha		1	See Order Capacity Field
OpenClose	Alpha		1	<ul style="list-style-type: none"> • Open = "O" • Closed = "C" • Carry Forward = Blank Space

6.10. Cross Order Accepted

This message acknowledges the receipt and acceptance of a valid New Cross Order.

Field	Type	Offset	Len	Details
MsgType	Alpha		1	x
Timestamp	Integer		8	Nanoseconds since midnight
FirmID	Alphanumeric		4	Firm ID (e.g. ABCD, 123A)
InstrumentId	Integer		4	Instrument ID, as specified by Instrument Directory Messages
CrossType	Alpha		1	<ul style="list-style-type: none"> • A=Auction • Q=QCC • C=CCC
AuctionType	Alpha		1	<p>See Auction Type Field</p> <p>If <i>CrossType</i> is set to A, possible values are P,H,S</p> <p>For other <i>CrossTypes</i> value N must be used</p>
AuctionID	Integer		4	Identifies the Auction being accepted. 0 if this order is not an auction.
AuctionAllocPct	Integer		1	Order Allocation percentage 0 <= n <= 40
Side	Alpha		1	<p>Side of the primary part of the Cross Order. Contra part is implied to be on the opposite side.</p> <ul style="list-style-type: none"> • B=Buy • S=Sell

Field	Type	Offset	Len	Details
ISO	Alpha		1	<ul style="list-style-type: none"> • N=Not ISO • I=ISO
PriceProtection	Alpha		1	<ul style="list-style-type: none"> • L=Local • N=National
EffectiveTime	Integer		8	Agreed upon time for the stopped price. UTC time in milliseconds.
DisclosureMask	Integer		1	See Disclosure Mask Field
Primary Side				
OrderId	Integer		8	Day-unique Order identifier assigned by exchange
ClOrdId	Alphanumeric		16	See Client Order Id
CMTA	Integer		4	CMTA
ClearingAccount	Alphanumeric		4	Sub-account/MM Identifier at the registered exchange
OCCAccount	Integer		4	OCC # to use for clearing (give up)
CustAcct	Alphanumeric		10	Account on the customer system (pass-through)
Price	Price		8	Limit price. Primary Side of a Cross order cannot be Market.
Quantity	Integer		4	Number of contracts
Capacity	Alpha		1	See Order Capacity Field
PositionEffectMask	Integer		2	See Position Effect Mask Field
StockLegShortSale	Alpha		1	<ul style="list-style-type: none"> • N=Not Applicable • H=Sell Short • E=Sell Short Exempt
StockLegMpid	Alphanumeric		4	Give-up for the stock leg
Contra Side				
OrderId	Integer		8	Day-unique Order identifier assigned by exchange
ClOrdId	Alphanumeric		16	See Client Order Id
CMTA	Integer		4	CMTA
ClearingAccount	Alphanumeric		4	Sub-account/MM Identifier at the registered exchange
OCCAccount	Integer		4	OCC # to use for clearing (give up)
CustAcct	Alphanumeric		10	Account on the customer system (pass-through)
OrderType	Alpha		1	<ul style="list-style-type: none"> • L=Limit • M=Market
Price	Price		8	Limit price. Should be set to 0 if Order Type = M.
Quantity	Integer		4	Number of contracts
Capacity	Alpha		1	See Order Capacity Field
PositionEffectMask	Integer		2	See Position Effect Mask Field
StockLegShortSale	Alpha		1	<ul style="list-style-type: none"> • N=Not Applicable • H=Sell Short • E=Sell Short Exempt
StockLegMpid	Alphanumeric		4	Give-up for the stock leg

6.11. Member Kill Switch Notification

The **Member Kill Switch Notification** informs of:

- Member Kill Switch Request issued by this OTTO account
- Kill Switch Action (User or System initiated) targeting Firm ID(s) associated with this OTTO account

Field	Type	Offset	Len	Details
MsgType	Alpha		1	k
Timestamp	Integer		8	Nanoseconds since midnight
FirmID	Alphanumeric		4	Firm ID issuing the request, blank if system initiated
CIRequestID	Alphanumeric		16	Client's identifier of the request , blank if system initiated
TargetFirmID	Alphanumeric		4	Firm ID affected by the Kill Switch Request
KillAction	Alpha		1	<ul style="list-style-type: none">• A=Block Entry of new requests and delete all open orders• R=Kill-switch block removed (by Exchange support personnel)• B= Block entry of new requests

7. Other Messages

7.1. Mass Cancel Response

Mass Cancel Response is sent out upon completion of processing of a valid Mass Cancel Request.

Field	Type	Offset	Len	Details
MsgType	Alpha		1	u
Timestamp	Integer		8	Nanoseconds since midnight
FirmID	Alphanumeric		4	Firm ID
CIRequestID	Alphanumeric		16	Client's identifier of the Mass Cancel Request
NumCanceled	Integer		4	Number of order canceled
NumPending	Integer		4	Number of order where cancelation is pending due to paused instrument state

7.2. Add Complex Instrument Response

Add Complex Instrument Response is sent out when new or existing complex strategy requested via

Add Complex Instrument Request is successfully created.

Field	Type	Offset	Len	Details
MsgType	Alpha		1	d
Timestamp	Integer		8	Nanoseconds since midnight
FirmID	Alphanumeric		4	Firm ID
CIRequestID	Alphanumeric		16	Client's identifier of the Add Complex Instrument Request
InstrumentID	Integer		4	Instrument (Strategy) ID assigned to the newly created instrument

7.3. Modify Trade Response

Modify Trade Response is sent when a valid Modify Trade Request is accepted.

Field	Type	Offset	Len	Details
MsgType	Alpha		1	m
Timestamp	Integer		8	Nanoseconds since midnight
FirmID	Alphanumeric		4	Firm ID (e.g. ABCD, 123A)
InstrumentID	Integer		4	Instrument ID, as specified by Options Directory notifications
ClRequestID	Alphanumeric		16	Client's identifier of the Modify Trade Request
ClOrdID	Alphanumeric		16	Identifies Order whose execution is being modified
CrossID	Integer		4	CrossID of the trade being modified
MatchID	Integer		4	MatchID of the trade being modified

7.4. Subscription Response

Subscription Response is sent after a valid Subscription Request has been processed.

Field	Type	Offset	Len	Details
MsgType	Alpha		1	f
Timestamp	Integer		8	Nanoseconds since midnight
FirmID	Alphanumeric		4	Firm ID
ClRequestID	Alphanumeric		16	Client's identifier of the Subscribe Request

7.5. Reject

Reject is sent in response to a **Request** that is deemed invalid. **Reject** message contains error code explaining the reason for rejection

Field	Type	Offset	Len	Details
MsgType	Alpha		1	j
Timestamp	Integer		8	Nanoseconds since midnight
RejectMsgType	Alpha		1	Type of the message being rejected
ClOrdID	Alphanumeric		16	Client order Id or Request Id of the message being rejected
RejectCode	Integer		2	Reason for the reject

7.6. Pending Response

A Pending Response is sent when a request cannot be immediately, fully processed or validated, and indicates that the final status of the request is not yet known. Please note that pending response is always followed by a final response indicating the final status of the initial request.

Field	Type	Offset	Len	Details
MsgType	Alpha		1	p
Timestamp	Integer		8	Nanoseconds since midnight
FirmID	Alphanumeric		4	Firm ID (e.g. ABCD, 123A)
InstrumentID	Integer		4	Instrument ID, as specified by Option Directory notifications
PendingMsgType	Alpha		1	Type of the message placed in pending state

Field	Type	Offset	Len	Details
ClOrdId	Alphanumeric		16	Client order id
PendingReason	Alpha		1	A=Request In Progress

8. Appendix

8.1. Field Details

8.1.1. Client Order Id / Request Id

Client Order or Client Request Identifier. The value of this field is used to:

- Target an open order via Replace and Cancel messages
- Identify executed orders on the CTI feed
- Provide correlation between OTTO requests, responses and notifications
- Provide safe replay semantics of client messages by detecting and discarding duplicates.

OTTO requires ClOrdId/ClRequestId to be unique for the OTTO Account for the duration of the entire trading session across all request types. Should a new request arrive with a ClOrdId or ClRequestId that has already been used, the request is silently discarded.

8.1.2. System Event Codes

Code	Explanation	When (typically)
O	<i>Start of Messages.</i> This is always the first message sent in any trading day.	After ~12:30am
S	<i>Start of System Hours.</i> This message indicates that the system is up and ready to start accepting orders.	~6:00am
Q	<i>Start of Opening Process.</i> This message indicates that the system has started its opening process.	9:30am
W	<i>End of WCO Early closing.</i> This message is intended to indicate that the exchange will no longer accept any new orders or changes to existing Orders on last trading date of WCO options.	12:00 Noon
N	<i>End of Normal Hours Processing.</i> This message indicates that the system will no longer generate new executions for options that trade during normal hours.	4:00pm
L	<i>End of Late Hours Processing.</i> This message indicates that the system will no longer generate new executions for options that trade during extended hours.	4:15pm
E	<i>End of System Hours.</i> This message indicates that the system is now closed.	~5:30pm
C	<i>End of Messages.</i> This is always the last message sent in any trading day.	~5:35pm

8.1.3. Order Capacity Field

- C=Customer
- F=Firm
- M=Market Maker
- O=Other-Exchange Registered Market Maker (FARMM/AWAYMM)
- P=Professional Customer
- B=Broker/Dealer
- J=Joint BackOffice (JBO)
- R=Retail
- " " (space)=N/A

Note, Retail and JBO order capacities are placeholders for future functionality on MRX or GEMX and are not supported at this time.

8.1.4. Auction Type Field

AuctionType field differentiates various auction types.

Code	Description	Initiate Using (message type)	Respond using (message type)
B	Block Order Auction	New Order	New Order
E	Complex Exposure Auction	New Order	New Order
F	Simple Exposure Order	New Order	n/a
O	Opening Auction	n/a	New Order
P	PIM Auction	New Cross Order	New Order
H	Facilitation Auction	New Cross Order	New Order
S	Solicitation Auction	New Cross Order	New Order
N	Order is neither an initiation nor a response to an Auction		

8.1.5. Position Effect Mask Field

This field carries order's Open-Close indicator. Since OTTO message supports Simple as well Multi-Leg orders, the *PositionEffectMask* accommodates open-close indicators for up to 10 legs.

Positions of the bits in this mask correspond to the legs of the order. For a simple order only bit 0 is evaluated; for complex orders only bits 0..(n-1) are evaluated, where n is number of legs.

- Set Bit (value 1) = Open
- Cleared Bit (value 0) = Close

8.1.6. Disclosure Mask Field

A single byte bit-mask where bits 0-5 have the following meaning:

- 0=Firm
- 1=Clearing Account
- 2=CMTA Account
- 3=Side (Block Order Only – ignored otherwise)
- 4=Price (Block Order Only – ignored otherwise)
- 5=Quantity (Block Order Only – ignored otherwise)

A set bit (value 1) makes the corresponding order attribute visible. A cleared bit (value 0) makes the corresponding order attribute hidden.

Bits 6 and 7 are ignored.

8.1.7. Cancel Reason

Reason	Explanation
U	User requested cancel. Sent in response to a Cancel Message
I	Immediate or Cancel order. This order was originally sent with a TIF=I and no further matches were available on the book so the remaining unexecuted shares were immediately canceled
S	Supervisory. This order was manually canceled by an Exchange supervisory terminal
D	This order cannot be executed because of a regulatory restriction (e.g. trade through restrictions).
Q	Anti-Internalize. The order was cancelled by the system to avoid trading with another order or quote with the same firm Id
B	ALO Order canceled to avoid being displayed at the price other than its limit

Reason	Explanation
A	Unexecuted Auction Response
K	Cancel triggered by Kill Switch
C	Cancel on Disconnect
O	Open Delay Timer Cancellation
P	ATR Limit Cancellation
Z	Original Order Cancel due to rejected Cancel Replace Attempt

8.1.8. Liquidity (Maker/Taker) Field Codes

Code	Description
0	None
1	Maker
2	Taker
4	Response
5	Hidden
6	Opening Rotation
7	Cross
8	Flashed Order
9	Flash Response
10	Routed Out
11	Trade Report
12	Combo Maker Against Combo
13	Combo Taker Against Combo
14	Combo Response Against Combo
15	Combo Hidden Against Combo
16	Combo Opening Rotation
17	Combo Cross
18	Combo Taker Against Regular
19	Regular Maker Against Combo
20	Combo Taker Against IO
21	Regular (incl. PIM) Taker Against IO
22	IO Maker Against Combo
23	IO Maker Against Regular
24	Regular Maker Against IO Participant
25	IO Participant Taker Against Regular
26	Broken Price Improvement
27	Broken Facilitation
28	Broken Solicitation
29	Combo Broken Price Improvement
30	Combo Broken Facilitation
31	Combo Broken Solicitation
32	Block
33	Block Response

Code	Description
34	Directed Response
35	Facilitation
36	Facilitation Response
37	Price Improvement
38	Price improvement Response
39	Solicitation
40	Solicitation Response
41	Qualified Contingent Cross
42	Customer to Customer
43	Combo Facilitation
44	Combo Facilitation Response
45	Combo Price Improvement
46	Combo Price Improvement Response
47	Combo Solicitation
48	Combo Solicitation Response
49	Combo Qualified Contingent Cross
50	Combo Customer to Customer
51	Sweep Routed Out
52	Sweep Trade Report
53	Combo Taker Against Regular – Thru NBBO
54	Combo Taker Against IO – Thru NBBO
55	Simple Exposure Order Initiator Upon Receipt
56	Simple Exposure Order Initiator
57	Simple Exposure Order Responder

8.1.9. Stock Execution Venues

ID of the stock leg execution venue:

- X=Not Applicable (non-QCC stock leg execution)
- G=Cheevers
- H=Libucki
- I=FOG Equities
- N=Nasdaq Execution Services

8.1.10. Reject Codes

Note: New Reject Codes may be added. Please contact support when receiving unrecognized reject code.

Reason	Value
Invalid Firm	10
Invalid Instrument	11
Invalid InstrumentType	12
Invalid Quantity	13
Invalid Price	14

Reason	Value
Invalid Side	15
Invalid Tif	16
Invalid Iso	17
Invalid AuctionType	18
Invalid AuctionId	19
Invalid OrderType	20
Invalid PrefParty	21
Invalid ALO	22
Invalid Capacity	23
Invalid ReservedInst	24
Invalid Trade	25
Invalid Format	26
Invalid CrossType	27
Invalid MinQuantity	28
Invalid PriceProtection	29
Invalid Reserve	30
Invalid Persist	31
Invalid ShortSaleInd	32
Invalid Product	33
Invalid Scope	34
Invalid Clearing Info	35
Invalid Position Effect	36
Invalid CrossId	37
Invalid MatchId	38
Invalid Client Order Id	39
Invalid Killswitch Action	40
Invalid Leg Count	41
Invalid Leg Type	42
Invalid Leg Ratio	43
Invalid Mpid	44
Invalid Time	45
Invalid Msg Type	46
Invalid Disclosure Mask	47
Post Only Reprice	48
Unauthorized GiveUp	49
Not Free Trading	101
Pref Not Allowed	102
Stock Combo Not Allowed	103
Instrument Halted	104
Kill Switch In Effect	105
System Closed	106
Test Mode	107

Reason	Value
Order Not Found	108
Too Late To Act	109
Instrument Closed	110
Instrument State	111
Action Not Allowed	112
LULD In Effect	113
Too Many Combos	114
Request Cancelled	115
System Error	143
Cancel on Disconnect	144

8.1.11. Time in Force (TIF) Field

Time in Force	Value
Day	D
FOK	F
IOC	I

8.2. Market Parameters

8.2.1. Auction Times

Auction Type	Duration
Block Order	100 milliseconds
Combo Exposure	100 milliseconds
Facilitation	100 milliseconds
PIM	100 milliseconds
Solicitation	100 milliseconds

8.2.2. Minimum Order Sizes

Order Type	Minimum allowed volume
Regular Order	1 contract
Customer-to-Customer Cross (CCC)	1 contract
Qual. Contingent Cross (QCC)	1,000 contracts
Block Order	50 contracts
Facilitation Order	50 contracts
PIM Order	1 contract
Solicitation Order	500 contracts

8.2.3. Maximum Price/Quantity

Description	Maximum
Order/Quote Price	\$99,999.9999
Order/Quote Simple and Standard Combo Quantity	999,999

Description	Maximum
Order/Quote Stock Combo Quantity	9,999,999
Standard Combo Leg Ratio	9,999
Stock Combo Leg Ratio	9,999
Combo Order Max "Legging-in"	Four

9. Revision Control Log

November 18, 2016: Complex Update and Auction Notification Enhancement-version 2.1

- Adding notification subscription request/response functionality
- Removing canonical leg details from complex instrument directory message
- Adding StockLegMPID to Order Accepted and Cross Order Accepted Messages
- Adding Add Complex Instrument Response Message
- Opening Only order support
- Adding System Event code for "Start of Currency Opening Process"
- Adding OrderType, BestResponsePrice, ExecFlag, FirmID, OCCAccount, CMTA to Auction Notification Message
- Removed Cancel by Exchange ID Request

December 16, 2016: Clarifying updates and Auction Notification Enhancement – version 2.1

- Renamed "New Auction" to "Auction Notification"
 - Added "order capacity" field to Auction Notification message (to match SQF and Order Feed)
 - Adding AuctionEvent to New Auction Notification to indicate new, updated or end of auction
 - Added BestResponseSize Auction Notification to keep consistent with with order feed
 - Adding AuctionEvent to New Auction Notification to indicate new, updated or end of auction
- Capacity Changes
 - Changing proprietary capacity enumeration to "E"
 - Adding Broker Dealer Customer capacity
- Modify Trade/Trade Details changes
 - Added Auctiontype field to Trade Details message
 - Clarified that Modify Trade request can be sent from any session within a firm
 - Adding PositionEffect/Capacity to Modify Trade/Trade Details request to allow adjustment of open/close
 - CMTA, ClearingAccount, OCCAccount, & CustAccount will not be carried forward from the original execution and are required on a Modify Trade Request. blanks and 0s will be interpreted as request to clear that field
 - StockLegMPID, Capacity and PositionEffect Mask will be carried forward from the original execution if not provided in the Modify Trade Request
- Adjusted positioneffect from bit to alpha to support "O" for Open, "C" for closed and Blank for Carry forward on a PTA
- Clarifying Block auctions cannot be modified
- Correcting Add Complex Instrument Message Type = "d"
- Correcting numlegs Field Length to 1 in Add complex instrument message
- Change disclosure mask fields to support block order hiding and clearing field attribution
- Reject code update
- DNTT orders can be modified to non-DNTT and vice versa

January 13, 2017: Clarifying updates– version 2.1

- Clarifying Preferenced cross or auction orders will be rejected
- Clarifying Block AON/FOK order entry instructions
- Clarifying Change in TIF does not cause loss in time priority
- Clarifying Member Kill Switch Request/Notification
- Protection for SQF Sweeps/Auction responses for the same firm
- Scope adjusted to Firm level
- Changing enumeration for Start of Currency Opening Process from “W” to “F”
- Adding reject codes
- Changing Price field DataType to Price, 8 in New order (Long form) request
- Changing Auction Timers to 100 ms for Block, Facilitation, PIM and Solicitation
- Adding TIF “F” for FOK and “A” for AON to all messages

February 23, 2017: Clarifying updates– version 2.1

- Clarifying All or None orders can only have time in force = IOC

March 9, 2017: Clarifying updates– version 2.1

- Auction Notifications will not be supported on ISE (Section 5.4)
- Clarifying Auction notification broadcast via Market Data Order Feed for Exposure auctions (Section 3.3.1.2)
- Clarifying Solicitation does not have maximum contract quantity different than system limit (Section 7.2.3)
- Adding supplementary UnderlyingSymbol field to Mass Cancel message (Section 4.4)
- Adding missing length for InstrumentType to Mass Cancel message (Section 4.4)
- Clarifying Flashinst description
- Clarifying BestResponsePrice handling for complex Exposure auctions (Section 5.4)
- Clarifying PriceProtection enumerations are “L” for Local and “N” for National and assumed as “L” on all New Order Cross submissions (Section 3.4.1)
- Clarifying Facilitation enumeration is “H” in AuctionType field in Facilitation description (Section 3.3.2.1)
- Clarifying auction orders/responses can be IOC (Section 3.3)
- Adding Reject codes
- Clarifying IOC Exposure auctions will cancel, not rest

April 3, 2017: Clarifying updates– version 2.1

- Adding SecuritySymbol to Simple Instrument Directory Message (Section 5.2.1)
- Clarifying EventSource enumeration for allocation splits on the TradeDetails message
- Adding Liquidity Code “0”

April 19, 2017: Clarifying update – version 2.1

- Removing FX Opening System Event Enumeration as FX products will open at 9:30 with other options

April 26, 2017: Clarifying update – version 2.1

- Adding ProductName to Add Complex Instrument Message

May 17, 2017: Clarifying update – version 2.1.1

- Adding Reject code 115
- QCC orders will be rejected

May 30, 2017: Clarifying update – version 2.1.1

- Adjusting Order of Cross Order Accepted Message; AuctionType and AuctionID fields will switching places.

June 13, 2017: Clarifying update – version 2.1.1

- Adding System Event enumeration “W” for early close of FX symbols on expiration day
- Adjusting system event enumeration “O” Start of Messages to 12:130 AM

August 8, 2017: Clarifying update – version 2.1.2

- Clarifying on Block Preferred PreferredParty field handling

December 1, 2017: Cancel on Disconnect Enhancement-version 2.1.2

- Added Cancel Reason for Cancel on Disconnect for ISE

February 12, 2018: Cancel on Disconnect Enhancement-version 2.1.2

- Added Cancel Reason for Cancel on Disconnect for MRX

February 20, 2018: Cancel on Disconnect Enhancement-version 2.1.2

- Added Cancel Reason for Cancel on Disconnect for GEMX

April 23, 2018: Turn on ISE Auction Notifications 2.1.3

- ISE to begin disseminating Auction notifications
- Adjusting Transtype for Split scenario in Trade Details Section from enumeration “E” to enumeration “B”
- Clarifying Opening only orders can only be limit. Market Opening only orders will be rejected

July 9, 2018: Introduce OTTO 2.1.4 to NOM

- Effective on a date in to be determined, OTTO 2.1.4 will be available on NOM

August 17, 2018: Introduce OTTO 2.1.4 to NOM

- Effective on November 19, OTTO 2.1.4 will be available on NOM
- Clarifying that JBO capacity will be supported for NOM only. ISE, GEMX and MRX will not support JBO at this time
- Clarifying contract size field in Simple Instrument Directory message will be populated with zero on NOM

August 27, 2018: Introduce OTTO 2.1.4 to NOM

- Clarifying that NOM will support OPG Market and Limit orders. ISE, GEMX and MRX will only support OPG limit orders
- Clarifying NOM Minimum Quantity orders can be submitted with a minimum quantity less than or equal to the full quantity of the order

October 4, 2018: Decommission Reserve orders on ISE

- Effective on Monday, November 5, ISE will no longer support Complex Reserve Orders

April 2019: Introduce Complex functionality on MRX

- Effective on a date June 24, 2019, MRX will introduce complex functionality

September 2019: Authorized Give up

- Add a reject code for Un-Authorized Give-Up rejects (49)

September 2019: OTTO 2.1.4 – ISE, GEMX, MRX System start up time change

- Adjusting start of messages “O” event on ISE, GEMX and MRX to begin at 2 AM

April 2020: OTTO 2.1.4 – Block AON Description Update

- Clarifying Block AON handling
- Adjusting start of messages “O” event on ISE, GEMX and MRX to begin at 12:30 AM
- Adjusting start of system hours “S” event on ISE, GEMX and MRX to begin at 6 AM

November 2022 OTTO 2.1.5 MRX Replatform Update

- Only MRX will support OTTO 2.1.5.
- ISE and GEMX will remain on OTTO 2.1.4
- Replacing flash auction with simple exposure order capability, resulting in removal of Do Not Flash functionality on New Order Message. This tag is now reserved with blank space expected or orders will be rejected
- Introducing new liquidity indicators 53-57
- ALO orders will require a firm level configuration to dictate the reprice vs cancel configuration
- Removing support for persistent functionality and replacing with a reserved field that will expect blank space
- Adding Instrument ID to Modify Trade and Modify Trade Response message
- StockCapacity field added to New order and Modify Trade messages. StockCapacity can be modified post trade.
- New Reject codes for System Error and Cancel on Disconnect (COD).
- StockCapacity field added to the New Cross Order message on the primary and contra sides (Added: 9/8/2022)
- Clarifying StockCapacity enumerations (Added: 9/8/2022)
- ClearingAccount will be accepted and sent to OCC with all 4 characters (Added: 9/8/2022)

March 31, 2023 OTTO 2.1.6 GEMX Replatform and MRX Stock Tied Introduction Update

- GEMX to adopt OTTO v2.1.6 during the Replatform scheduled to begin November 6, 2023
- MRX to introduce Stock tied is planned for a date to be determined and announced by the exchange
- Introducing placeholder enumeration “N” for Nasdaq Execution Services in the StockVenue field
- Introducing placeholder functionality update to support execution rate checks for the Market Wide Risk Protection Complex with stock instruments
- Clarifying Auction responses cannot be submitted as DNTT but can be submitted as Sell Short Exempt

June 2023 OTTO 2.1.6- Stock execution venues enumeration

- Update Stock Execution Venues enumeration by removing ‘A’ and ‘B’ and modifying the description for ‘X’.

July 2023 OTTO 2.1.6- Clarifying Trade Details Message in case of Complex Exposure

- Only the side contra to Complex Exposure will show ‘E’.