



OUCH Protocol Specification

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1 Summary of Changes

No	Changes	Comment
1	In Chapter Message Formats, added field OffHours and update of existing field Reserved in subchapter Enter Order on page 8 .	
2	Order Accepted message is updated with off-hours flag.	
3	Mass Quote functionality added with MassQuote (Q) and MAssQuoteAck(K) messages.	R.2.11 (21 May 2020)
4	MassQuoteAck message updated.	R.2.11 (1 July 2020)
5	MassQuoteAck message offset updated	10 July 2020
6	Updated of order replaced message description	
7	Notes in Client/Account field in Table 6: Mass Quote is updated by changing valid values to capital letter	5 May 2021
8	Customer Info field in Table 2 and Table 3 is updated by adding a note	8 September 2021
9	Notes in Reason field in Order Canceled Message is updated.	29 September 2021

2 About the Manual

The purpose of this document is to describe the OUCH protocol.

2.1 References

For more information, refer to the following documents:

- *Genium INET ITCH Protocol Specification*
- *System Error Message Reference*

3 OUCH Overview

The OUCH protocol accepts limit orders from system participants and executes matching orders when possible. Non-matching orders may be added to the order book where they are waiting to be matched according to the matching priority model.

OUCH is a simple protocol that allows Genium INET Trading users to enter orders, replace and cancel existing orders and receive executions. It is intended to allow participants and their software developers to integrate Genium INET Trading into their proprietary trading systems or to build custom front ends.

OUCH only provides a method for participants to send orders to Genium INET Trading and receive updates on those orders entered. For information about all orders entered into and executed on the Genium INET Trading book, refer to the ITCH protocol specification.

OUCH is the low-level native protocol for connecting to the Genium INET Trading system. It is designed to offer the maximum possible performance at the cost of flexibility and ease of use. For applications that do not require this extreme level of performance, Genium INET Trading offers other, more standard interfaces that may be more suitable and easier to develop to.

3.1 Architecture

The OUCH protocol is composed of logical messages passed between the OUCH host and the client application. Each message type has a fixed message length. The messages are binary encoded, which means that all numeric values are represented as binary values. Character or string values are composed of non-control ISO 8859-9 (Latin-9) encoded bytes.

All (outbound) messages sent from the OUCH system to the client are assumed to be sequenced, and their delivery is guaranteed by the lower level protocol. The SoupBinTCP protocol (specification available separately) is used to guarantee the delivery and sequencing of OUCH messages sent from the host to the client. Please refer to the SoupBinTCP manual for details.

Messages sent from the OUCH client to the host are inherently non-guaranteed, even if they are carried by a lower level protocol that guarantees delivery (like TCP/IP sockets). Therefore, all host-bound messages are designed so that they can be benignly resent for robust recovery from connection and application failures.

Each physical OUCH host port is bound to an OUCH Account assigned by the marketplace. On a given day, every order entered on OUCH is uniquely identified by the combination of the logical OUCH Account and the participant-created Token field.

3.2 Data Types

All Integer fields are composed of binary encoded numbers.

Table 1: Data Types

Type	Size	Notes
Numeric	1, 2, 4, 8 or 12 bytes	Unsigned big-endian binary encoded numbers. NOTE: Exception, Reject Code is signed integer.

Type	Size	Notes
Alpha	variable	Left justified and padded on the right with spaces. Composed of non-control ISO 8859-9 (Latin-9) encoded bytes.
Price	4 bytes	Prices are signed integer fields. Number of decimals and allowed tick steps are specified in the ITCH Order book Directory message (Number of decimals in Price). NOTE: Order books may also trade in fractions. This is also indicated in the Order book Directory message.
Timestamp	8 bytes	UNIX Time (number of nanoseconds since 1970-01-01 00:00:00 UTC)

3.3 Fault Redundancy

A single OUCH Account can be bound to two physical OUCH gateways. These OUCH gateways then act as mirrors of each other for fault redundancy. In this configuration, the client can connect to any one of the gateways. It is not allowed to be logged on to both gateways simultaneously. The system will log out the first client session when a second is established for the same account.

The OUCH Gateway does not support nor block another OUCH Account accessing the standby gateway port of an already engaged primary gateway port.

4 Message Formats

4.1 Inbound Messages

Inbound messages are sent from the participant’s application to the OUCH host. They are not sequenced. All Inbound Messages may be repeated benignly. This gives the client the ability to resend any inbound message if, in the case of a connection loss or an application error, it is uncertain whether or not the Genium INET Trading system received it.

The idea of benign inbound message retransmission with end-to-end acknowledgement is fundamental to OUCH’s fail-over redundancy. If your connection ever fails, there is no way for you to know if pending messages actually made it over the link before the failure. A robust OUCH client can safely resend any pending messages over a mirrored link without worrying about generating duplicates. This applies to Genium INET Trading’s disaster failover capability as well; if the system 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 resend the pending messages, making the failover seamless to the end user.

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

4.1.1 Enter Order

Enter Order is used to enter a new order into the system. The response to a successful Enter Order is an Order Accepted message. If the order is rejected, the Order Rejected message will be returned.

Note

- All orders entered via OUCH will default to the Round Lot type. The quantity of the order must be a multiple of the Round Lot Size. The Round Lot Size of a particular order book can be found in the ITCH Order book Directory message.
- All Or None orders are not supported.
- Account Info should use the **Client/Account** field for the derivatives market and the **Exchange Info** field for the equity market.

Table 2: Enter Order Message

Name	Offset	Length	Value	Notes
Message Type	0	1	"O"	Enter Order Message.
Order Token	1	14	Alpha	Client-generated order identifier.
Order book ID	15	4	Numeric	Order book identifier.
Side	19	1	Alpha	Values: "B" = Buy order "S" = Sell order "T" = Short sell

Name	Offset	Length	Value	Notes
Quantity	20	8	Numeric	Quantity.
Price	28	4	Price	Signed integer price. Number of decimals and allowed tick steps are given by the Order book Directory message in ITCH. This field also tells if the security is traded in fractions.
Time In Force	32	1	Numeric	Values: 0 = Day 3 = Immediate or Cancel (FaK) 4 = Fill or Kill
Open Close	33	1	Numeric	Position update for the account. Values: 0 = Default for the account 1 = Open 2 = Close/Net
Client/Account	34	16	Alpha	Pass-thru field. Mandatory for Fund orders. Agency/Fund Code (AFK). <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <p>Note Account Info should use this field for the derivatives market.</p> </div>
Customer Info	50	15	Alpha	Pass-thru field. Client Reference field. <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <p>Note SOH character should not exist in this field.</p> </div>
Exchange Info	65	32	Alpha	Client Account number. Only the first 16 bytes are used. Using more than the first 16 bytes might lead to the transaction getting rejected. <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <p>Note Account Info should use this field for the equity market.</p> </div>
Display Quantity	97	8	Numeric	Display quantity if reserved order, otherwise set to zero (0).
Client Category	105	1	Numeric	Type of client. Values: 1 = Client 2 = House 7 = Fund 9 = Investment Trust 10 = Primary Dealer Govt 11 = Primary Dealer Corp 12 = Portfolio Mgmt Company <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <p>Note Client Category is not used by the derivatives market.</p> </div>
OffHours	106	1	Numeric	Values: 1 = Off-hour Orders 0 = Normal hours

				Other values are subjected to reject the request Note: Off-hours will be used by the Derivatives market.
Reserved	107	7		Reserved for future use.

4.1.2 Replace Order

Replace Order is used to modify an existing order entered via OUCH.

Modification of some order parameters may not be allowed, depending on how the system is configured. An Order Rejected will be returned in such case.

There are two order tokens in the Replace message.

- **Existing Order Token**

The Existing Order Token is used to reference the order to be replaced. The Order Token should be from the original Enter Order, not from any intermediate replaces. The current implementation allows intermediate tokens to be used, but this may not be supported in the future.

- **Replacement Order Token**

The Replacement Order Token is the new Order Token that will be assigned to the order if the replace is successful. The replacement Order Token must not be a token previously used in Enter Order or Replace Order transactions.

The response to a Replace Order is:

- **Order Replaced** if the modification was successful. The Order Replaced will contain the current state of the returned order. See below for a discussion on order quantities.
- **Order Rejected** if the replace failed.

Table 3: Replace Order Message

Name	Offset	Length	Value	Notes
Message Type	0	1	"U"	Replace Order Message.
Existing Order Token	1	14	Alpha	Should be the Order Token from the original Enter Order, not from any intermediate replaces.
Replacement Order Token	15	14	Alpha	
Quantity	29	8	Numeric	Desired Open Quantity of the order.
Price	37	4	Price	Signed integer price. Number of decimals and allowed tick steps are given by the Order book Directory message in ITCH. This field also tells if the security is traded in fractions. Setting Price to 0 means "no change".
Open Close	41	1	Numeric	Position update for the account. Values: 0 = No change 1 = Open 2 = Close/Net 4 = Default for the account

Client/Account	42	16	Alpha	Pass-thru field. <i>i</i> Note Account Info should use this field for the derivatives market.
Customer Info	58	15	Alpha	Pass-thru field. <i>i</i> Note SOH character should not exist in this field.
Exchange Info	73	32	Alpha	Client Account number. Only the first 16 bytes are used. Using more than the first 16 bytes might lead to the transaction getting rejected. <i>i</i> Note Account Info should use this field for the equity market.
Display Quantity	105	8	Numeric	Desired displayed quantity (zero for unchanged).
Client Category	113	1	Numeric	Type of client. Values: 1 = Client 2 = House 7 = Fund 9 = Investment Trust 10 = Primary Dealer Govt 11 = Primary Dealer Corp 12 = Portfolio Mgmt Company <i>i</i> Note Client Category is not used by the derivatives market.
Reserved	114	8		Reserved for future use.

4.1.2.1 Order Quantities

In Genium INET OUCH Replace messages, the Quantity field contains the desired total quantity of the order (Order Quantity = open quantity + executed quantity, where open quantity is the quantity of the order in the order book).

Example 1:

1. An order with a quantity of 1000 is entered via OUCH. An Order Accepted with Quantity = 1000 will be returned.
2. A partial execution for 200 occurs. A quantity of 800 is left in the order book. An Executed Order with Traded Quantity = 200 will be returned.
3. The client wants to decrease the open quantity (quantity in the book) to 750. He sends in an Order Replace with Quantity = 950. A Replaced Order with Quantity = 750 will be returned.

Example 2:

1. An order with a quantity of 1000 is entered via OUCH. An Order Accepted with Quantity = 1000 will be returned.
2. The client wants to decrease the open quantity (quantity in the book) to 500. He sends in an Order Replace with Quantity = 500.

3. Simultaneously, 600 of the order is (partially) traded. An Executed Order with Traded Quantity = 600 will be returned.
4. The client receives an Order Replaced with Quantity = 0 and Order Status = Not on book, since there is no quantity left in the order book.

4.1.2.2 Retaining Order book Priority

Most order attributes are allowed to change in Genium INET. A replacement of a certain attribute may cause the order to lose priority, depending on what values are modified, how the system is configured, and so on. A detailed description of the circumstances when a replace causes priority loss is out of scope for this document.

In order to increase the likelihood of keeping an order from losing priority as it is changed, all fields that are intended to be left unchanged should be left unset.

- For Numeric Order parameters, this means setting them to 0 (zero).
- For String (Alpha) fields, the first byte should be set to binary zero '\0' to retain previous value.

Note

- Since the system assumes “no change” on fields set to 0, it is not possible to change Price to 0.
- The system may be configured to reject replaces that would cause a loss of priority.

4.1.3 Cancel Order

Partial cancels are not supported with the Cancel Order message. Use Order Replace to modify an existing order.

The response to a successful Cancel Order is an Order Canceled message. Failed Cancel Order messages are rejected with the Order Reject message.

Note

The Order Token should be from the original Enter Order, not from any intermediate replaces. The current implementation allows intermediate tokens to be used, but this may not be supported in the future.

Table 4: Cancel Order Message

Name	Offset	Length	Value	Notes
Message Type	0	1	"X"	Cancel Order Message
Order Token	1	14	Alpha	Should be the Order Token from the original Enter Order, not from any intermediate replaces.

4.1.4 Cancel by Order ID

Using the system-generated Order ID, this message can be used to cancel any order in the book regardless of over during which session it was inserted.

The response to a successful Cancel by Order ID is an Order Canceled message. Failed Cancel by Order ID messages are rejected with the Order Reject message.

Table 5: Cancel By Order ID Message

Name	Offset	Length	Value	Notes
Message Type	0	1	"Y"	Cancel By Order ID Message
Order book ID	1	4	Numeric	
Side	5	1	Alpha	Values: "B" = Buy order "S" = Sell order
Order ID	6	8	Numeric	The identifier assigned to the order by the system.

4.1.5 Mass Quote

The Mass Quote message is used by market makers to send quotes into a market. The quote messages are typically used to send continuous unsolicited quotes in markets with tradable quoting. A quote should be two-sided, i.e. normally contains both bid and offer price and size. All quotes are valid until the end of the day (or until canceled).

The Mass Quote message allows the user to submit multiple quotes (currently restricted with 5 quotes) in a single message. Quotes for different securities must belong to the same partition in the mass quote message. One quote (two-sided) per participant per instrument is allowed.

"Mass Quote Acknowledgement (MsgType = K)" or "Mass Quote Rejection (MsgType = R)" is sent as a return message for Mass Quote. The quote flow detailed in "Appendix A, Workflows for Quoting" section with samples. To summarize flow mass quote return flow;

All quotes rejected;

If the all quotes are *not* accepted in mass quote, then only one "Mass Quote Rejection" message without OrderBookID sent as a response for mass quote block.

All quotes accepted

"Mass Quote Acknowledgement (MsgType = K) is sent for each accepted quotes in mass quote. Totally two "K" messages sent as a response which is for bid and offer side.

Some quotes accepted & some quotes rejected

"Mass Quote Acknowledgement (MsgType = K) or "Mass Quote Rejection (MsgType = R) is sent for each individual quote in mass quote.

For rejected quotes;

➔ One "R" message with OrderbookID sent for the specific individual quote.

For accepted quotes;

➔ Two "K" message sent for the specific individual quote (bid and offer side).

Quotes can be replaced by sending a new Mass Quote for the same instrument(s). It is possible to replace only one side of a double sided quote and leave one side unchanged (for example to avoid losing priority). To leave one side of the quote unchanged, set the quantity (*Bid Size = 0 OR Offer Size = 0*) on that side set to 0. This is true even if the currently quoted price is zero

(zero is a valid price for certain instruments). If both price and quantity is set to zero that will be interpreted as a quote cancel (see below).

Quotes can be cancelled by sending a new Mass Quote with with bid and offer prices and sizes all set to zero. It shall also be possible to cancel only one side of a double-sided quote by setting the price and the quantity on that side to zero. (*Bid Price = 0 && Offer Price = 0 && Bid Size = 0 && Offer Size = 0*)

The insert/update/cancel requests are detailed in “Appendix B, Quote Matrix” section.

Note

- "QuoteSet" include OrderbookID(4), BidPx(4), OfferPx(4), BidSize(8), OfferSize(8) and require 28 characters.
- The number of mass quote (defined in NoQuoteEntries by user) restricted with 5 quotes.

Table 6: Mass Quote

Name	Offset	Length	Value	Notes
Message Type	0	1	"Q"	Mass Quote
OrderToken	1	14	Alpha	Client-generated quote identifier. Unique for each request (new, update, cancellation)
Client Category	15	1	Numeric	Type of client. Values: 1 = Client 2 = House 7 = Fund 9 = Investment Trust 10 = Primary Dealer Govt 11 = Primary Dealer Corp 12 = Portfolio Mgmt Company
Client/Account	16	16	Alpha	Agency/Fund Code Values: PYM (piyasa yapıcı müşteri / market maker client) PYP (piyasa yapıcı portföy / market maker portfolio)
Exchange Info	32	16	Alpha	Client account number
NoQuoteEntries	48	2	Numeric	Number of double-sided quotes in QuoteSet. Each QuoteSet contains a repeating group of QuoteEntries for the Mass Quote message where each entry represents an individual two-sided quote. Currently maksimum 5 quotes allowed such as; 1 st Quote between offset 50-77 2 nd Quote between offset 78-105 3 rd Quote between offset 106-133 4 th Quote between offset 134 – 161 5 th quote between offset 162-189 Note: Mass quote message length should be dynamic according to NoQuoteEntries value.

→OrderBookID	50	4	Numeric	Order book identifier of first quote
→BidPx	54	4	Price	Price. Number of decimals and allowed tick steps are given by the Order book Directory message in ITCH.
→OfferPx	58	4	Price	Price. Number of decimals and allowed tick steps are given by the Order book Directory message in ITCH.
→BidSize	62	8	Numeric	Quantity
→OfferSize	70	8	Numeric	Quantity

4.2 Outbound Messages

Outbound messages are generated by the system and sent to the OUCH client.

4.2.1 Order Accepted

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

Accepted Messages are guaranteed to come before any Executed Messages or Canceled Messages for an order.

Note

If the order is traded or otherwise changed immediately at entry, the Order Accepted will show the state of the order after any such operations. Execution messages and/or cancel messages will follow to account for any differences.

Table 7: Order Accepted Message

Name	Offset	Length	Value	Notes
Message Type	0	1	"A"	Order Accepted Message.
Timestamp – Nanoseconds	1	8	Timestamp	UNIX Time (number of nanoseconds since 1970-01-01 00:00:00 UTC).
Order Token	9	14	Alpha	
Order book ID	23	4	Numeric	Order book identifier.
Side	27	1	Alpha	Values: "B" = Buy order "S" = Sell order "T" = Short sell
Order ID	28	8	Numeric	The identifier assigned to the new order. Note that the number is only unique per Order book and side.
Quantity	36	8	Numeric	Quantity currently open in the book.
Price	44	4	Price	Signed integer price. Number of decimals is given by the Order book Directory message in ITCH. This field also tells if the security is traded in fractions.

Time In Force	48	1	Numeric	Values: 0 = Day 3 = Immediate or Cancel (FaK) 4 = Fill or Kill
Open Close	49	1	Numeric	Position update for the account. Values: 0 = No change 1 = Open 2 = Close/Net 4 = Default for the account
Client/Account	50	16	Alpha	Pass-thru field. Note Account Info should use this field for the derivatives market.
Order State	66	1	Numeric	Values: 1 = On book 2 = Not on book 98 = Paused
Customer Info	67	15	Alpha	Pass-thru field.
Exchange Info	82	32	Alpha	Only the first 16 bytes are used. Using more than the first 16 bytes might lead to the transaction getting rejected. Note Account Info should use this field for the equity market.
Pre Trade Quantity	114	8	Numeric	Pre-trade quantity.
Display Quantity	122	8	Numeric	Display quantity if reserved order, otherwise set to zero (0).
Client Category	130	1	Numeric	Type of client. Values: 1 = Client 2 = House 7 = Fund 9 = Investment Trust 10 = Primary Dealer Govt 11 = Primary Dealer Corp 12 = Portfolio Mgmt Company Note Client Category is not used by the derivatives market.
OffHours	131	1	Numeric	Values: 1 = Off-hour Orders 0 = Normal hours Other values are subjected to reject the request Note: Off-hours will be used by the Derivatives market.
Reserved	132	3		Reserved for future use.

4.2.2 Order Rejected

This message is used to reject Enter Order messages, Cancel Order messages, and Replace Order messages.

Table 8: Order Rejected Message

Name	Offset	Length	Value	Notes
Message Type	0	1	"J"	Order Rejected Message.
Timestamp – Nanoseconds	1	8	Timestamp	UNIX Time (number of nanoseconds since 1970-01-01 00:00:00 UTC).
Order Token	9	14	Alpha	Populated from the incoming order, invalid values will be preserved.
Reject Code	23	4	Numeric	Backend Error Code. See <i>System Error Messages Reference</i> for more information.

4.2.3 Order Replaced

This message acknowledges the receipt and acceptance of a valid Replace Order Message. The data fields from the Replace Order Message are echoed back in this message. Note that the accepted values may differ from the entered values for some fields. You will receive one and only one of these two for each replacement.

Like Accepted Messages, Replaced Messages use the Order State field to denote that a replace was accepted and then automatically canceled when the Order State is Not on book (2).

Note

- If an order is modified by the system, the Replacement OrderToken will be blanked out (with spaces). The Previous Order Token will contain the current Order Token as entered by the client.
- If an order is modified using another protocol, ownership of that order is considered to be changed to that protocol/session. The OUCH client who had entered the order will receive an Order replaced with Order State set to 99 – OUCH order ownership lost. No further order updates will be received after this. The only action possible on a “lost” order is Cancel by Order ID.

Table 9: Order Replaced Message

Name	Offset	Length	Value	Notes
Message Type	0	1	"U"	Order Replaced Message.

Timestamp – Nanoseconds	1	8	Timestamp	UNIX Time (number of nanoseconds since 1970-01-01 00:00:00 UTC).
Replacement Order Token	9	14	Alpha	
Previous Order Token	23	14	Alpha	
Order book ID	37	4	Numeric	Order book identifier.

Name	Offset	Length	Value	Notes
Side	41	1	Alpha	Values: "B" = Buy order "S" = Sell order "T" = Short sell
Order ID	42	8	Numeric	The identifier assigned to the new order. Note that the number is only unique per Order book and side.
Quantity	50	8	Numeric	Quantity currently open in the book.
Price	58	4	Price	Signed integer price. Number of decimals is given by the Order book Directory message in ITCH. This field also tells if the security is traded in fractions.
Time In Force	62	1	Numeric	Values: 0 = Day 3 = Immediate or Cancel (FaK) 4 = Fill or Kill
Open Close	63	1	Numeric	Defines the position update for the account. Values: 0 = No change 1 = Open 2 = Close/Net 4 = Default for the account
Client/Account	64	16	Alpha	Pass-thru field. Note Account Info should use this field for the derivatives market.
Order State	80	1	Numeric	Values: 1 = On book 2 = Not on book 98 = Paused orders 99 = OUCH order ownership lost
Customer Info	81	15	Alpha	Pass-thru field.
Exchange Info	96	32	Alpha	Only the first 16 bytes are used. Using more than the first 16 bytes might lead to the transaction getting rejected. Note Account Info should use this field for the equity market.
Pre Trade Quantity	128	8	Numeric	Pre-trade quantity.
Display Quantity	136	8	Numeric	The displayed quantity in case the order is a reserve order or zero if the order is not a reserve order.

Name	Offset	Length	Value	Notes
Client Category	144	1	Numeric	Type of client. Values: 1 = Client 2 = House 7 = Fund 9 = Investment Trust 10 = Primary Dealer Govt 11 = Primary Dealer Corp 12 = Portfolio Mgmt Company <i>i</i> Note Client Category is not used by the derivatives market.

4.2.4 Order Canceled

A Canceled Message informs you that an order has been canceled. This could be acknowledging a Cancel Order Message, or it could be the result of system cancellation of the order.

i **Note**

Order Canceled messages are sent out when orders are suspended due to connection loss. Orders cannot be reactivated again, but it is possible to cancel a suspended order, so therefore it is possible to receive more than one Order Canceled message for the same order.

Table 10: Order Canceled Message

Name	Offset	Length	Value	Notes
Message Type	0	1	"C"	Order Canceled Message.
Timestamp – Nanoseconds	1	8	Timestamp	UNIX Time (number of nanoseconds since 1970-01-01 00:00:00 UTC).
Order Token	9	14	Alpha	
Order book ID	23	4	Numeric	Order book identifier.
Side	27	1	Alpha	Values: "B" = Buy order "S" = Sell order "T" = Short sell
Order ID	28	8	Numeric	The identifier assigned to the canceled order. Note that the number is only unique per Order book and side.

Name	Offset	Length	Value	Notes
Reason	36	1	Numeric	<p>Contains the system change reason values. Values:</p> <ul style="list-style-type: none"> 1 = Canceled by user / Canceled by Other User 3 = Trade 4 = Inactivate 5 = Replaced by User 6 = New 8 = Converted by System 9 = Canceled by System 10 = Canceled by Proxy 11= BaitRecalculated 12 = Triggered by System 13 = Refreshed by System 15 = Canceled by System Limit Change 17 = Linked Leg Canceled 18 = Linked Leg Modified 19 = Expired 20 = Canceled Due to ISS 21 = Inactivated Due to ISS 23 = Inactivated Due to Purge 24 = Inactivated Day Order 25 = Inactivated Due to DeList 26 = Inactivated Due to Expiry 27 = Inactivated Due to Outside Limits 28 = Transfer of Ownership 29 = New Inactive 30 = Reloaded 31 = Reloaded Intraday 34 = Canceled After Auction 35 = Inactivated Due to Outside Price Limits 36 = Activated Due to Outside Limits 37 = Trigger on Session Order Triggered 39 = Undisclosed Quantity Order Converted 40 = Inactivated Due to Order Value 41 = Canceled by System Delta Protection 42 = Canceled by System Quantity Protection 43 = Internal Crossing Delete 44 = Canceled Due to Participant Block on Market 45 = Inactivated Due to Participant Block on Market 52 = Paused 53 = Activated Paused Order 56 = Linked Leg Activated 115 = Deleted: PTRM misc 116 = Deleted: PTRM user limits auto 117 = Deleted: PTRM user limits manual 118 = Deleted: PTRM market limits 119 = Deleted: PTRM investor limits 120 = Deleted: PTRM margin breach 121 = Deleted: PTRM participant suspension 122 = Deleted: PTRM mra suspension 123 = Deleted: PTRM mca suspension 124 = Deleted: PTRM ta suspension

4.2.5 Order Executed

This message is returned when a partial or full fill occurs. In case of a combination order fill, one Order Executed message will be received per leg.

Table 11 : Order Executed Message

Name	Offset	Length	Value	Notes
Message Type	0	1	"E"	Order Executed Message.
Timestamp – Nanoseconds	1	8	Timestamp	UNIX Time (number of nanoseconds since 1970-01-01 00:00:00 UTC).
Order Token	9	14	Alpha	
Order book ID	23	4	Numeric	Needed for Combination fills (Order Executed sent per leg).

Name	Offset	Length	Value	Notes
Traded Quantity	27	8	Numeric	
Trade Price	35	4	Price	Signed integer trade price. Number of decimals is given by the Order book Directory message in ITCH. This field also tells if the security is traded in fractions.
Match ID	39	12	Numeric	Backend-generated identifier. Unique per trade message.
Client Category	51	1	Numeric	Type of client. Values: 1 = Client 2 = House 7 = Fund 9 = Investment Trust 10 = Primary Dealer Govt 11 = Primary Dealer Corp 12 = Portfolio Mgmt Company Note Client Category is not used by the derivatives market.
Reserved	52	16		Reserved for future use

4.2.6 Mass Quote Acknowledgement

Mass Quote Acknowledgement is used as a positive response to a Mass Quote message. Every quote in mass quote message must be responded with an individual message (Mass Quote Acknowledgement OR Mass Quote Rejection).

An acknowledgement message can be sent for both positive ack. "QuoteStatus" field describe the status of quote such as accepted, updated, cancelled and unsolicited update/cancel.

If the individual quote in mass quote is accepted, system send two Mass Quote Acknowledgement messages for bid and offer side.

Table 12: Mass Quote Acknowledgement

Name	Offset	Length	Value	Notes
Message Type	0	1	"K"	Mass Quote Acknowledgement
Timestamp – Nanoseconds	1	8	Timestamp	UNIXTime(number of nanosecondssince1970-01-01 00:00:00 UTC).
Order Token	9	14	Alpha	Client-generated quote identifier.
OrderBookID	23	4	Numeric	Order book identifier
Quantity	27	8	Numeric	Leaves quantity
TradedQuantity	35	8	Numeric	
Price	43	4	Price	Price in MassQuote message. (Exception: Traded Price)

Side	47	1	Alpha	Values: "B" = Buy side (bid) "S" = Sell side (offer)
QuoteStatus	48	4	Numeric	Identifies the status of the mass quote acknowledgement. Valid values: 0 = Accept 1 = Updated 2 = Canceled 3 = Unsolicited update 4 = Unsolicited cancel 5 = Traded

4.2.1 Mass Quote Rejection

Mass Quote Rejection shall be used as a negative response to a Mass Quote message.

This message has two uses;

- ➔ If the individual quote in mass quote is rejected, a single "Mass Quote Rejection" sent for each quote with OrderbookID.
- ➔ In case of all quotes rejected in mass quote message, system send only one "Mass Quote Rejection" for all quote request without OrderbookID. All quotes can rejected for below reasons;
 - Duplicate Order Token
 - Invalid number of quote (number of quote in mass quote request exceed the allowed limit)
 - Invalid Price – Bid & Offer Price are equal for all quotes in mass quote

Table 13 : Mass Quote Rejection

Name	Offset	Length	Value	Notes
Message Type	0	1	"R"	Mass Quote Rejection
Timestamp – Nanoseconds	1	8	Timestamp	UNIXTime(number of nanosecondssince1970-01-01 00:00:00 UTC).
Order Token	9	14	Alpha	Client-generated quote identifier.
OrderBookID	23	4	Numeric	Order book identifier
Reject Code	27	4	Numeric	Identifies the rejection of the mass quote. See error code catalog for details.

5 Appendix A, Workflows for Quoting

The purpose of this section is to describe the flow of mass quote alternatives.

5.1 Mass Quote acknowledgement in which all quotes are accepted

#	Quote Issuer		Trading System
1	A mass Quote with 3 entries is sent in (MsgType = Q) -Unique OrderToken-	→	
2			← Positive Acknowledge for first bid quote (MsgType = K and QuoteStatus = 0) Unique with OrderToken and OrderBookID and Side
3			← Positive Acknowledge for first offer quote (MsgType = K and QuoteStatus = 0) Unique with OrderToken and OrderBookID and Side
4			← Positive Acknowledge for second bid quote (MsgType = K and QuoteStatus = 0) Unique with OrderToken and OrderBookID and Side
5			← Positive Acknowledge for second offer quote (MsgType = K and QuoteStatus = 0) Unique with OrderToken and OrderBookID and Side
6			← Positive Acknowledge for third bid quote (MsgType = K) Unique with OrderToken and OrderBookID and Side
7			← Positive Acknowledge for third offer quote (MsgType = K and QuoteStatus = 0) Unique with OrderToken and OrderBookID and Side

5.2 Mass Quote acknowledgement in which some quotes are accepted and some quotes rejected;

#	Quote Issuer		Trading System
1	A mass Quote with 3 entries is sent in (MsgType = Q) -Unique OrderToken-	→	
2			← Positive Acknowledge for first bid quote (MsgType = K and QuoteStatus = 0) Unique with OrderToken and OrderBookID and Side

#	Quote Issuer		Trading System	
3			←	Positive Acknowledge for first offer quote (MsgType = K and QuoteStatus = 0) Unique with OrderToken and OrderBookID and Side
4			←	Rejection for second quote (MsgType =R) Unique with OrderToken and OrderBookID
5			←	Positive Acknowledge for third bid quote (MsgType = K and QuoteStatus = 0) Unique with OrderToken and OrderBookID and Side
6			←	Positive Acknowledge for third offer quote (MsgType = K and QuoteStatus = 0) Unique with OrderToken and OrderBookID and Side

5.3 Mass Quote within which all quotes are rejected;

#	Quote Issuer		Trading System	
1	A mass Quote with 3 entries is sent in (MsgType = Q) -Unique OrderToken-	→		
2			←	Rejection for mass quote Only one order reject message sent out without OrderBookID (MsgType =R) -Unique OrderToken-

5.4 Replacement of a mass quote and then cancelling request;

#	Quote Issuer		Trading System	
1	A mass Quote with 2 entries is sent in (MsgType = Q) OrderToken = Q1	→		
2			←	Positive Acknowledgement for first bid quote (MsgType = K and QuoteStatus = 0) Unique with OrderToken=Q1 and OrderBookID1 and Side
3			←	Positive Acknowledgement for first offer quote (MsgType = K and QuoteStatus = 0) Unique with OrderToken=Q1 and OrderBookID1 and Side

#	Quote Issuer		Trading System
4			← Positive Acknowledgement for second bid quote (MsgType = K and QuoteStatus = 0) Unique with OrderToken=Q1 and OrderBookID1 and Side
5			← Positive Acknowledgement for second offer quote (MsgType = K and QuoteStatus = 0) Unique with OrderToken=Q1 and OrderBookID2 and Side
6	Quote Modification (A new mass quote sent for replacement.) →Replace double side of first quote →Replace one side of second quote (MsgType = Q) OrderToken = Q2 1st quote→ (Bid Price = X && Offer Price = Y && Bid Size = W && Offer Size = Z) 2nd quote→(Bid Price = X && Offer Price = Y && Bid Size = W && Offer Size = 0)	→	
7			← Positive Acknowledgement for first bid quote (MsgType = K and QuoteStatus = 1) Unique with OrderToken2 and OrderBookID1 and Side
8			← Positive Acknowledgement for first offer quote (MsgType = K and QuoteStatus = 1) Unique with OrderToken2 and OrderBookID1 and Side
9			← Positive Acknowledgement for second bid quote (MsgType = K and QuoteStatus = 1) Unique with OrderToken2 and OrderBookID2 and Side
10			Positive Acknowledgement for second offer quote (MsgType = K and QuoteStatus = 1) Unique with OrderToken2 and OrderBookID2 and Side
11	Send a cancel request for an individual security. →Cancel double side of first quote →Cancel one side of second quote (MsgType = Q) OrderToken = Q3 1st quote→ (Bid Price = 0 && Offer Price = 0 && Bid Size = 0 && Offer Size = 0)	→	

#	Quote Issuer		Trading System	
	2nd quote → (Bid Price = 0 && Offer Price = <<blank>> && Bid Size = 0 && Offer Size = <<blank>>)			
12			←	Positive Acknowledgement for first bid quote (MsgType = K and QuoteStatus = 2) Unique with OrderToken3 and OrderBookID1 and Side
13			←	Positive Acknowledgement for first offer quote (MsgType = K and QuoteStatus = 2) Unique with OrderToken3 and OrderBookID1 and Side
14			←	Positive Acknowledgement for second bid quote (MsgType = K and QuoteStatus = 2) Unique with OrderToken3 and OrderBookID2 and Side
15			←	Positive Acknowledgement for second offer quote (MsgType = K and QuoteStatus = 2) Unique with OrderToken3 and OrderBookID2 and Side

5.5 Trade Scenario in mass quote entry

#	Quote Issuer		Trading System	
1	A mass Quote with 1 entry is sent in (MsgType = Q) -Unique OrderToken-		→	
2			←	Positive Acknowledgement for the bid side quote (MsgType = K and QuoteStatus = 0) Unique with OrderToken=Q1 and OrderBookID1 and Side
3			←	Partial/Fully trade acknowledgemen for the sell side quote (MsgType = K and QuoteStatus = 5) Quantity (leavesQty), TradedQuantity, TradedPrice Unique with OrderToken=Q1 and OrderBookID1 and Side *MassQuoteAck message with QuoteStatus=5(Traded) is a kind of ack message, therefore there will be no additional MassQuoteAck message with QuoteStatus=0(accept)

6 Appendix B, Quote Matrix

	BidPx	BidSize	OfferPx	OfferSize
New two-sided quote	>0	>0	>0	>0
New one-sided(bid) quote	>0	>0	0	0
New one-sided(offer) quote	0	0	>0	>0
Replace two-sided quote (Px&Size)	>0	>0	>0	>0
Replace two-sided quote (Px)	>0	0	>0	0
Replace two-sided quote (Size)	>0	>0	>0	>0
Replace one-sided (bid) quote (Px&Size)	>0	>0	>0	0
Replace one-sided (bid) quote (Px)	>0	0	>0	0
Replace one-sided (bid) quote (Size)	>0	>0	>0	0
Replace one-sided (offer) quote (Px&Size)	>0	0	>0	>0
Replace one-sided (offer) quote (Px)	>0	0	>0	0
Replace one-sided (offer) quote (Size)	>0	0	>0	>0
Cancel two-sided quote	0	0	0	0
Cancel one-sided (bid) quote	0	0	>0	>0
Cancel one-sided (offer) quote	>0	>0	0	0

