



OUCH Trading Specification for Equities

Version 2.0

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1. Introduction

This document explains access to the equities trading services of Osaka Digital Exchange (ODX) PTS via the OUCH protocol. It describes the service's configuration and specifies the application messages. For further information and inquiries regarding trading services or for questions concerning connectivity please contact ODX PTS Technical Support via email to: sysope@odx.co.jp.

2. Overview

The message protocol of OUCH is widely used and considered an industry standard. By using the OUCH protocol, clients are able to access different markets and liquidity pools operated by ODX PTS. They can enter new orders, modify or cancel existing orders, and receive execution reports in real-time.

The point-to-point transport layer for OUCH messages is [SoupBinTCP](#).

3. Fault Redundancy

A single OUCH account can be bound to multiple physical OUCH machines, which then act as mirrors of each other for fault redundancy. In this configuration, these OUCH machines are able to accept orders and cancel requests, and any outbound messages will be simultaneously generated.

4. Service Configuration

An OUCH trading service can be configured to accept and maintain multiple OUCH sessions per client. However only one active connection is allowed to a particular OUCH machine per account.

For any client's OUCH account, the Cancel on Disconnect feature is always active. All open orders created by an OUCH account which has lost connection to all OUCH hosts due to any reason, will be automatically withdrawn. For every withdrawn order an unsolicited cancellation message will be sent to the client upon connection re-establishment.

5. Data Types

Integer fields are unsigned big-endian (network byte order) binary encoded numbers.

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

Token fields are 4 byte Integer fields. They are sequential and increasing, and must be unique per OUCH account within a trading day.

Price fields are 4 byte Integer fields. When converted to fixed point number format they have 9 whole number digits and 1 decimal place. The maximum representable value is 214,748,364.6 (7FFFFFFE hex).

Quantity fields are 4 byte Integer fields with a maximum representable value of 2,147,483,647 (7FFFFFFF hex).

6. Inbound Messages

Inbound messages are sent from the client's application to the OUCH host. All inbound messages may be repeated benignly. This gives the client the ability to re-send any inbound message if it is uncertain whether ODX PTS received it in the case of a connection loss or an application error.

The idea of benign inbound message retransmission with end-to-end acknowledgment is fundamental to the fault redundancy implementation. If the client's connection ever fails, there is no way of knowing if pending messages actually made it over the link before the failure. A robust OUCH client can safely re-send any pending messages over a mirrored link without worrying about generating duplicates.

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.

6.1 Enter Order Message

An Enter Order Message is used to enter a new order into the ODX PTS execution system.

Every valid order sent is acknowledged by an Order Accepted Message. An Enter Order Message with an Order Token out of sequence will be silently ignored.

Name	Offset	Length	Type	Comments
Message Type	0	1	Alpha	Value is O = Enter Order Message.
Order Token	1	4	Token	Must be unique per OUCH account within a trading day and increasing.
Client Reference	5	10	Alpha	Assigned by the client. This field is forwarded to the clearing and settlement venues. There is no validation of this field.
Buy/Sell Indicator	15	1	Alpha	Side of order. Values: B = Buy S = Sell T = Short sell E = Short sell exempt
Quantity	16	4	Integer	Number of shares.
Orderbook Id	20	4	Alpha	4 digit Quick code.
Group	24	4	Alpha	Orderbook group identifier. Values: DAY = Daytime
Price	28	4	Integer	Price of the order.
Time in Force	32	4	Integer	Specifies how long the order remains in effect. Values: 0 = Immediate 99999 = Day Other values are not supported (order will be rejected).
Firm Id	36	4	Integer	Identifier for the order entry firm. This field should be set to zero unless specifying a client's MPID. Also forwarded to the downstream systems if required.
Display	40	1	Alpha	Instructions for order handling. Values: P = Post-only Leave blank if unused.
Capacity	41	1	Alpha	Designates the capacity of the firm placing the order. Values: A = Agency P = Principal
Minimum Quantity	42	4	Integer	Specifies the minimum acceptable quantity to execute. Non zero values are only supported for immediate orders.

Name	Offset	Length	Type	Comments
Order Classification	46	1	Alpha	High Frequency Trading (HFT) order classification. Values: 1 = Non HFT 3 = HFT market making strategy 4 = HFT arbitrage strategy 5 = HFT directional strategy 6 = HFT other strategy
Cash Margin Type	47	1	Alpha	Cash margin type of the order. Values: 1 = Cash 2 = Margin open (Negotiable) 3 = Margin close (Negotiable) 4 = Margin open (Standardized) 5 = Margin close (Standardized)

6.2 Replace Order Message

A Replace Order Message is used to modify an existing order. It requires two valid order tokens, an existing token which must match an existing order for that account and a replacement token which must comply as for the Enter Order Message.

A Replace Order Message will be silently ignored if the Existing Order Token is no longer live or the Replacement Order Token is out of sequence.

If the order associated with the Existing Order Token is live but the replace details (except the Replacement Order Token) are invalid, the order will be canceled and removed from the book. In this case the Replacement Order Token is not consumed and may be reused.

The Quantity field on the Replace Order Message denotes the total quantity for the entire order chain. For example:

- An order is entered for a quantity of 100, it is validated and accepted.
- A quantity of 25 is executed.
- An additional quantity of 15 is executed.
- If the client wishes to replace the order and still be exposed for the balance of 60, then the Replace Order Message must specify a quantity of 100 – the current balance plus the cumulative executed quantity.

An order may not be replaced with a new total quantity less than the cumulative executed quantity. An attempt to do so results in the cancellation of the existing order.

For an order replaced with a new total quantity equal to the cumulative executed quantity, the replace is accepted with state Dead.

Name	Offset	Length	Type	Comments
Message Type	0	1	Alpha	Value is U = Replace Order Message.
Existing Order Token	1	4	Token	Must match exactly with that of the current live order.
Replacement Order Token	5	4	Token	Must be unique per OUCH account within a trading day and increasing.
Quantity	9	4	Integer	Total number of shares for the entire order chain, that is, the desired balance plus the cumulative number of shares executed.
Price	13	4	Integer	Price of the order.

Name	Offset	Length	Type	Comments
Time in Force	17	4	Integer	Specifies how long the order remains in effect. Values: 0 = Immediate 99999 = Day Other values are not supported (order will be rejected).
Display	21	1	Alpha	Instructions for order handling. Values: P = Post-only Leave blank if unused.
Minimum Quantity	22	4	Integer	Specifies the minimum acceptable quantity to execute. Non zero values are only supported for immediate orders.

6.3 Cancel Order Message

A Cancel Order Message is used to request that an order be canceled.

Note that the only acknowledgment to a Cancel Order Message is the resulting Order Canceled Message. There is no “too late to cancel” message and superfluous Cancel Order Messages are silently ignored.

Name	Offset	Length	Type	Comments
Message Type	0	1	Alpha	Value is X = Cancel Order Message.
Order Token	1	4	Token	Must match exactly with that of the current live order.
Quantity	5	4	Integer	Reserved. Field will be ignored, although recommended to set to zero.

7. Outbound Sequenced Messages

Outbound messages are generated by the OUCH host and received by the client's application.

7.1 System Event Message

A System Event Message signals a ODX PTS system wide event.

Name	Offset	Length	Type	Comments
Message Type	0	1	Alpha	Value is S = System Event Message.
Timestamp	1	8	Integer	Number of nanoseconds past midnight.
System Event	9	1	Alpha	Refer to the System Events table below.

Table 1: System Events

Event	Description
S	Start of Day – Always the first message. Indicates the market is open and ready to start accepting orders.
E	End of Day – Indicates the market is closed and will not accept any new orders. There will be no further executions.

7.2 Order Accepted Message

An Order Accepted Message acknowledges the receipt and acceptance of a valid Enter Order Message. The data fields from the Enter Order Message are echoed back in this message.

An Order Accepted Message is sent with state Dead for an immediate order which is accepted but fails to

execute. No additional messages will be sent for that order. Order state Dead means that the order was accepted and automatically canceled.

Name	Offset	Length	Type	Comments
Message Type	0	1	Alpha	Value is A = Order Accepted Message.
Timestamp	1	8	Integer	Number of nanoseconds past midnight.
Order Token	9	4	Token	Order Token as entered.
Client Reference	13	10	Alpha	Client Reference as entered.
Buy/Sell Indicator	23	1	Alpha	Buy/Sell Indicator as entered. Values: B = Buy S = Sell T = Short sell E = Short sell exempt
Quantity	24	4	Integer	Number of shares accepted.
Orderbook Id	28	4	Alpha	Orderbook identifier as entered.
Group	32	4	Alpha	Orderbook group identifier as entered. Values: DAY = Daytime
Price	36	4	Integer	Accepted price of the order.
Time in Force	40	4	Integer	Time in Force as accepted. Values: 0 = Immediate 99999 = Day
Firm Id	44	4	Integer	Firm identifier as accepted.
Display	48	1	Alpha	Display as accepted. Values: P = Post-only Blank if unused.
Capacity	49	1	Alpha	Capacity of the firm placing the order as entered. Values: A = Agency P = Principal
Order Number	50	8	Integer	Day unique reference number of the order.
Minimum Quantity	58	4	Integer	The accepted minimum acceptable quantity to execute.
Order State	62	1	Alpha	Order state upon acceptance. Values: L = Live D = Dead
Order Classification	63	1	Alpha	High Frequency Trading (HFT) order classification. Values: 1 = Non HFT 3 = HFT market making strategy 4 = HFT arbitrage strategy 5 = HFT directional strategy 6 = HFT other strategy

Name	Offset	Length	Type	Comments
Cash Margin Type	64	1	Alpha	Cash margin type of the order. Values: 1 = Cash 2 = Margin open (Negotiable) 3 = Margin close (Negotiable) 4 = Margin open (Standardized) 5 = Margin close (Standardized)

7.3 Order Replaced Message

An Order Replaced 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.

In the same manner as Order Accepted Messages, Order Replaced Messages sent with state Dead denote that a replace was accepted and then automatically canceled.

Name	Offset	Length	Type	Comments
Message Type	0	1	Alpha	Value is U = Order Replaced Message.
Timestamp	1	8	Integer	Number of nanoseconds past midnight.
Replacement Order Token	9	4	Token	Replacement Order Token as entered.
Buy/Sell Indicator	13	1	Alpha	Buy/Sell Indicator as entered on the original order in the chain. Values: B = Buy S = Sell T = Short sell E = Short sell exempt
Quantity	14	4	Integer	Total number of shares outstanding.
Orderbook Id	18	4	Alpha	Orderbook identifier as entered on the original order in the chain.
Group	22	4	Alpha	Orderbook group identifier as entered on the original order in the chain. Values: DAY = Daytime
Price	26	4	Integer	Accepted price of the order.
Time in Force	30	4	Integer	Time in Force as accepted. Values: 0 = Immediate 99999 = Day
Display	34	1	Alpha	Display as accepted. Values: P = Post-only Blank if unused.
Order Number	35	8	Integer	Day unique reference number of the order.
Minimum Quantity	43	4	Integer	The accepted minimum acceptable quantity to execute.
Order State	47	1	Alpha	Order state upon replacement. Values: L = Live D = Dead

Name	Offset	Length	Type	Comments
Previous Order Token	48	4	Token	Order token of the replaced order.

7.4 Order Canceled Message

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

Name	Offset	Length	Type	Comments
Message Type	0	1	Alpha	Value is C = Order Canceled Message.
Timestamp	1	8	Integer	Number of nanoseconds past midnight.
Order Token	9	4	Token	Order token of the canceled order.
Decrement Quantity	13	4	Integer	Number of shares decremented from the order. This number is incremental, not cumulative.
Order Canceled Reason	17	1	Alpha	Reason the order was reduced or canceled. Refer to the Order Canceled Reasons table below.

Table 2: Order Canceled Reasons

Reason	Description
U	User requested the order to be canceled. Sent in response to a Cancel Order Message or a Replace Order Message.
L	User logged off.
S	This order was manually canceled by a supervisory terminal. For example, emergency withdraw per user's request or the user got suspended.
I	An order with 'Immediate' Time In Force was executed and with no further matches available on the book the remaining quantity was canceled.
M	Order expired during match.
X	Invalid price.
Z	Invalid quantity.
N	Invalid minimum quantity.
Y	Invalid order type.
D	Invalid display type.
V	Exceeded order value limit.
i	Short sell order restriction.
R	Order not allowed at this time.
F	Flow control is enabled and this OUCH port is being throttled.
G	Margin order canceled due to margin restriction.
O	Other.

7.5 Order AIQ Canceled Message

An Order AIQ Canceled Message informs that an order has been canceled by ODX PTS trading system to prevent a self-trade. This is an extended version of the Order Canceled Message with specifics of the prevented trade.

Name	Offset	Length	Type	Comments
Message Type	0	1	Alpha	Value is D = Order AIQ Canceled Message.
Timestamp	1	8	Integer	Number of nanoseconds past midnight.
Order Token	9	4	Token	Order token of the canceled order.
Decrement Quantity	13	4	Integer	Number of shares decremented from the order. This number is incremental, not cumulative.
Order Canceled Reason	17	1	Alpha	Reason the order was reduced or canceled. Value is M = Order expired during match.
Quantity Prevented from Trading	18	4	Integer	Number of shares that would have executed if the trade had occurred.
Execution Price	22	4	Integer	Price at which the trade would have occurred.
Liquidity Indicator	26	1	Alpha	Identifies whether this would-be trade was a result of a liquidity provider providing or liquidity taker taking the liquidity. Values: A = Added (for the passive firm) R = Removed (for the aggressor)

7.6 Order Executed Message

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

Name	Offset	Length	Type	Comments
Message Type	0	1	Alpha	Value is E = Order Executed Message.
Timestamp	1	8	Integer	Number of nanoseconds past midnight.
Order Token	9	4	Token	Order token of the executed order.
Executed Quantity	13	4	Integer	Incremental number of shares executed.
Execution Price	17	4	Integer	Price at which the shares were executed.
Liquidity Indicator	21	1	Alpha	Identifies whether this trade was a result of a liquidity provider providing or liquidity taker taking the liquidity. Values: A = Added (for the passive firm) R = Removed (for the aggressor)
Match Number	22	8	Integer	Day unique reference number of the match. The matching buy and sell executions have the same match number.

7.7 Order Rejected Message

An Order Rejected Message may be sent in response to an Enter Order Message if the order cannot be accepted.

Name	Offset	Length	Type	Comments
Message Type	0	1	Alpha	Value is J = Order Rejected Message.
Timestamp	1	8	Integer	Number of nanoseconds past midnight.
Order Token	9	4	Token	Order token of the rejected order.
Order Rejected Reason	13	1	Alpha	Reason the order was rejected. Refer to the Order Rejected Reasons table below.

Table 3: Order Rejected Reasons

Reason	Description
H	There is currently a trading halt so no orders can be accepted on this orderbook at this time.
S	Invalid orderbook identifier.
X	Invalid price.
Z	Invalid quantity.
N	Invalid minimum quantity.
Y	Invalid order type.
D	Invalid display type.
V	Exceeded order value limit.
i	Short sell order restriction.
R	Order not allowed at this time.
F	Flow control is enabled and this OUCH port is being throttled.
G	Invalid margin specification.
L	MPID not allowed for this port.
c	User does not have permission to enter an order on the given board.
O	Other.

Revision History

Date	Version	Description
2022-05-02	1.0	Initial revision.
2023-03-31	2.0	Orderbook Id alphanumeric support