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# HPR Riskbot – Australia (ASX)

The HPR Riskbot provides a protocol transparent connection to the Australian Securities Exchange (ASX) binary trading Interface

## Table of Contents

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# Revision History

| **Issue Date** | **Version No.** | **Assignee** | **Change Description** |
|---|---|---|---|
| 20 March 2017 | 1.0 | Robert Wilkie | Document creation |
| 10 July 2023 | 1.1 | Ashutosh Gupta | Updated Order Origin field description |
| | | | |

# 1. Document control

## 1.1. Document Audience

This document is intended to be read by UBS clients who are trading into the Australian Securities Exchange via the UBS ULLDMA platform.

## 1.2. Related documents

Latest exchange specifications from the Australian Securities Exchange at the time of producing this document.

# 2. Overview

## 2.1. This Document

This document is intended to serve as a guide for trading in the Australian Securities Exchange via UBS' FPGA-based risk system.

This document is solely meant to be used as a reference point for protocol and system functionality.

# 3. System functionality

## 3.1. Order Entry Background

### 3.1.1. Messages and Protocol

All HPR clients need to disclose LLT code to UBS. UBS will need the LLT code for registration of respective exchange logons with ASX.

All transactions will be entered into the ASX System using the Binary Trading Protocol as described in the exchange specifications.

Any differences from that document will be noted below.

## 3.2. Connection and Login

### 3.2.1. Connection Properties

UBS will provide the Australian Securities Exchange connection properties for each login in a separate document. These fields are detailed below:

| Property | Remark |
|---|---|
| Client Login | As provided by UBS, used to access the exchange |
| Client Password | As provided by UBS, used to access the exchange |
| Target IP and port | Target IP and port, as directed by exchange |
| ASX Partition | Partition of instrument series |

### 3.2.2. Client Login

Client is expected to perform the connectivity to the Australian Securities Exchange involving a TCP connection as per the system interface documentation outlined by the ASX.

### 3.2.3. Heartbeats

Once successfully logged on, the client must send a Heartbeat (0) message every 15 seconds.

### 3.2.4. Sequence Numbers

A client will typically log in with sequence number 1 at the beginning of each day, and any subsequent intraday logons will continue the sequence numbering.

If a sequence reset is required by the Exchange the client will need to contact UBS so the Risk Control Gateway can be reset to remain synchronized with the client.

## 3.3. Field Validations

UBS enforces mandatory field validations for the exchange business messages. A message which fails any validation will be rejected by the Risk Control Gateway.

| Validate Contents | Requirement |
|---|---|
| Y | UBS validates this field |
| N | UBS does not need to validate the field |

| Ensure Field Present | Requirement |
|---|---|
| P | Field must be sent in client message |

## 3.4. New Order Message

### 3.4.1. Table of New Order Fields and Validations

| Present | Validate | Field | Validation |
|---|---|---|---|
| P | Y | Message Type | <table><tr><th>Type</th><th>Value</th></tr><tr><td>New order</td><td>O</td></tr></table> Must always be O |
| P | Y | Order Token | Must be unique per trading day. This field value can be referenced by client in order amend / cancel messages. |
| P | Y | Order Book ID | Order book identifier (i.e. the instrument identifier) |
| P | Y | Side | <table><tr><th>Type</th><th>Value</th></tr><tr><td>Buy</td><td>B</td></tr><tr><td>Sell</td><td>S</td></tr><tr><td>Short sell</td><td>T</td></tr></table> Must be one of the above values |
| P | Y | Quantity | Must be greater than 0 |
| P | Y | Price | Must be greater than 0 |
| P | Y | Time in Force | <table><tr><th>Type</th><th>Code</th></tr><tr><td>Day</td><td>0</td></tr><tr><td>FAK</td><td>3</td></tr><tr><td>FOK</td><td>4</td></tr></table> Must be one of the above values |
| P | Y | Client/Account | Must be set to Trading Account code provided by UBS |
| P | Y | Exchange Info | Must be set to the below pattern:<br>• Seven Spaces<br>• Side of Order (B, S, T)<br>• Ouch ID<br><br>*Example*<br>**Sell order for BHP:**<br>"  S000113D8" |
| P | Y | Clearing Participant | Must be set to the last digit of the 4 digit Clearing Code provided by UBS |
| P | Y | Crossing Key | Must be set to Crossing Key value provided by UBS |

| | | | |
|---|---|---|---|
| P | Y | Capacity of Participant | <table><tr><th>Type</th><th>Value</th></tr><tr><td>Agency</td><td>A</td></tr><tr><td>Principal</td><td>P</td></tr></table> Must be one of the above values |
| P | Y | Directed Wholesale | Must be set to Directed Wholesale value provided by UBS |
| P | Y | Intermediary ID | Must be set to Intermediary ID value provided by UBS. |
| P | Y | Order Origin | Must be set to Order Origin value provided by UBS. |
| P | Y | Short Sell Quantity | Must be set to 0 for Buy and Long Sell.<br>Must be set to Order Quantity for Short Sell |
| P | Y | Minimum Acceptable Quantity | Must be greater than 0 |

## 3.5. Amend Order Message

### 3.5.1. Table of Amend Order Fields and Validations

| Present | Validate | Field | Validation |
|---|---|---|---|
| P | Y | Message Type | <table><tr><th>Type</th><th>Value</th></tr><tr><td>Replace Order</td><td>U</td></tr></table> Must always be U |
| P | Y | Existing Order Token | Must be ID of live client order |
| P | Y | Replacement Order Token | Must be unique per trading day. This field value can be referenced by client in order amend / cancel messages. |
| P | Y | Quantity | Must be greater than 0 |
| P | Y | Price | Must be greater than 0 |
| P | Y | Client/Account | Set same value as original order |
| P | Y | Exchange Info | Set same value as original order |
| P | Y | Capacity of Participant | Set same value as original order |
| P | Y | Directed Wholesale | Set same value as original order |
| P | Y | Order Origin | Set same value as original order |
| P | Y | Short Sell Quantity | Must be set to 0 for Buy and Long Sell.<br>Must be set to Order Quantity for Short Sell |
| P | Y | Minimum Acceptable Quantity | Must be greater than 0 |

## 3.6. Cancel Order Message

### 3.6.1. Table of Cancel Order Fields and Validations

| Present | Validate | Field | Validation |
|---|---|---|---|
| P | Y | Message Type | <table><tr><th>Type</th><th>Value</th></tr><tr><td>Replace Order</td><td>X</td></tr></table> Must always be X |
| P | Y | Order Token | Must be token of live order |

## 3.7. Execution Reports

### 3.7.1. Successful Executions

New Order, Amend Order and Cancel Order messages will be responded to with an Execution Report. All order messages will receive one of Order/Amend/Cancel Registered message(s) or Order/Amend/Cancel Accepted message(s), as well as Order Executed message(s) where appropriate.

### 3.7.2. Execution Rejects

New, Amend and Cancel Order requests may be rejected by either the Risk Control Gateway, or by the Australian Securities Exchange.

A Reject generated by the Australian Securities Exchange will contain a Reject Code as detailed in the interface specification with a corresponding Reason field.

An Execution Reject may also be synthesised by the Risk Control Gateway and these Reject messages may be identified by:

- Field "Reject Code" = -1 and additional information in additional fields from offset 30 as per table below.
- Field "Error Mask" = 0xNNNNNNNNNNNNNNN is a hexadecimal number corresponding to one or more of the reject descriptions as below:

| Error Type | Error Mask | Description |
|---|---|---|
| **Max Price Fault** | 0x1 | Order Price greater than Max set |
| **Max Quantity Fault** | 0x2 | Order Quantity greater than Max set |
| **Max Value Fault** | 0x4 | Order Value greater than Max set |
| **Clearly Erroneous Price Fault** | 0x8 | Order Price check fault |
| **Symbol Permission Fault** | 0x10 | Symbol not permissioned for side – B/S/SS |
| **Unknown Symbol Fault** | 0x40 | Order Symbol not valid |
| **Market Order Fault** | 0x200 | Order Type Market not allowed |
| **Sub-penny Fault** | 0x800 | Order Price not in multiple of tick size |
| **HPR ROE Fault** | 0x2000 | Field validation/parse fault |
| **Customer ROE Fault** | 0x10000 | Field value validation fault |

In event there are more than one reason for reject, the field "Error Mask" is AND of all applicable error mask hex values.
e.g. if order is rejected for 'Max Qty Fault' + 'Clearly Erroneous Price Fault' + 'Symbol Permission Fault' i.e. 0x2 + 0x8 +0x10 , the resulting field "Error Mask" will be 0x1a

Where a synthesised reject is received by the client, the original New, Amend or Cancel message will not be sent to the Australian Securities Exchange gateway. However, a heartbeat message will be sent, thus maintaining the contiguity of the sent sequence numbers. The client should send the subsequent message with the next logical sequence number.

### 3.7.3. VTOE (Virtual TCP Offload Engine)

| Protocol | | | Field | Offset | Length (bytes) | Value | Type | Description |
|---|---|---|---|---|---|---|---|---|
| SoupBinTCP | | | **Packet Length** | 0 | 2 | 28/60 | Integer | Without HPR Suffix / With Optional HPR Suffix |
| | | | **Packet Type** | 2 | 1 | "U" | | Un-sequenced Data Packet |
| | Message | Nasdaq OUCH | **Message Type** | 3 | 1 | "J" | Alpha | Indentifies an order rejected message |
| | | | **Timestamp** | 4 | 8 | | Integer | Timestamp – reflected as the number of nanoseconds since the Epoch |
| | | | **Order Token** | 12 | 14 | ZCCCCCCCCCCCCC | Token | Order Token field with overwritten first character |
| | | | **Reject Code** | 26 | 4 | -1 | Integer | Indicates a HPR reject |
| | | HPR Suffix (Optional Config) | **Identification** | 30 | 3 | "HPR" | ASCII | Always set to HPR |
| | | | **Type** | 33 | 1 | 0 | Unsigned 8-bit integer | An integer representing the type of HPR notification message. A value of 0 indicates a rejected trading message. |
| | | | **Reserved** | 34 | 4 | | N/A | Reserved for future use. |
| | | | **Error Mask** | 38 | 8 | See table above | Unsigned 64-bit integer | A 64-bit mask used to identify the reason the packet was rejected |
| | | | **Reserved** | 46 | 8 | | N/A | Reserved for future use. |
| | | | **Minimum Price Collar** | 54 | 4 | | Unsigned 32-bit integer | Implied 4 digits of precision, only populated on HPR clearly erroneous reject |
| | | | **Maximum Price Collar** | 58 | 4 | | Unsigned 32-bit integer | Implied 4 digits of precision, only populated on HPR clearly erronerous reject |
| | | | | **62** | | | | |

### 3.8. Recovery

If an exchange connection is disconnected without a clean logout, it is necessary to re-login at the next expected sequence number.
This is to ensure that:

- Any executions post disconnection are communicated
- Any unsolicited order actions (e.g. Manual Cancellation by the Australian Securities Exchange) are communicated

## 4. FIX Drop Copy

A FIX Drop Copy (FDC) is available to clients which normalises the exchange messages into FIX messages.

FDC follow the standard FIX protocol with certain HPR specific requirements as defined in "HPR - FIX – UBS ROE" document.

The latest copy of this document can be requested from UBS account manager.

- End of Document -