READINESS TEST PROCEDURES

HKEX Orion Market Data Platform Derivatives Datafeed Products (OMD-D)

Version 1.6
28 Apr 2026

DOCUMENT HISTORY

Distribution Version

Version	Date of Issue	Comments
V1.0	2 January 2014	First Issue
V1.1	25 April 2014	Updated the submission date for Appendix A
V1.2	17 June 2014	Updated the Appendix A – OMD-D Readiness Test Result Declaration Form
V1.3	19 May 2017	Update test details for Test Condition 6.5 in Session 7
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V1.5	24 Apr 2023	Removed Appendix A Section 1, 5, 7.2 - Rephrased wordings related to “HKEX” and added description for target readers
V1.6	28 Apr 2026	Removed Readiness Test Session 6

Table of Contents

1 Introduction

The target readers of this document are the technical personnel of Market Data Vendors, End-Users, Application Service Providers ("ASPs") and Independent Software Vendors ("ISVs") of HKEX Orion Market Data Platform – Derivatives Market ("OMD-D").
Clients intending to make direct connection to the OMD host to receive market data are required to complete a Readiness Test conducted in the Open Test Environment with positive results. The Readiness Test aims to facilitate Clients' verification of the technical readiness of their feed handlers for receiving and processing OMD messages.

This document specifies the testing procedures in the Readiness Test for **OMD-D**.

The Readiness Test requirements could be changed and fine-tuned from time to time.

In order to be granted direct access to the OMD host, Clients must submit a completed declaration form for their readiness. The authorized person for the declaration should also read this document to understand the Readiness Test requirements.

2 Pre-requisites

Clients are required to fulfill the pre-requisite requirements below before proceeding to the Readiness Test:

- Development of feed handler in accordance with OMD Interface Specification
- Successful testing of the feed handler with OMD onboarding tools
- Connection to the End-to-End Open Test Environment according to the OMD Connectivity Guide

3 Testing Approach & Readiness Policy

The Readiness Test is a "self-test" in the sense that Clients will be provided with an Answer Book of expected results of all test cases for them to verify if their feed handlers can interpret the OMD messages correctly and handle the technical features of OMD properly.

Basically, the scope of the test in Chapter 6 is applicable to clients of all OMD datafeed products unless otherwise specified.

Clients must participate in all test sessions in the Readiness Test unless specified otherwise and achieve positive results. After successful completion of the Readiness Test, Clients are required to declare their readiness by submitting following documents:
- Readiness Test Result Declaration Form ("the Declaration Form") on OMD-D page
- Readiness Test Answer Book ("the Answer Book") on OMD-D page

If a Client fails to obtain any of the expected results in the Readiness Test, the Client should re-test their feed handler in the open test environment before requesting another test slot to re-conduct the Readiness Test.

4 Readiness of Indirect Connection Clients

Clients who are providing OMD feeds in OMD original format to the indirect connection OMD Clients are required to ensure the readiness of such indirect connection Clients by providing the proper OMD environment to them to complete all Readiness test scenarios as indicated in this document.

5 Test Arrangement and Procedure

In general, during the Readiness Test a stream of OMD multicast messages will be sent over a number of multicast channels same as the production setting as detailed in the OMD Connectivity Guide for Derivatives Market Datafeed Products ("the Connectivity Guide").

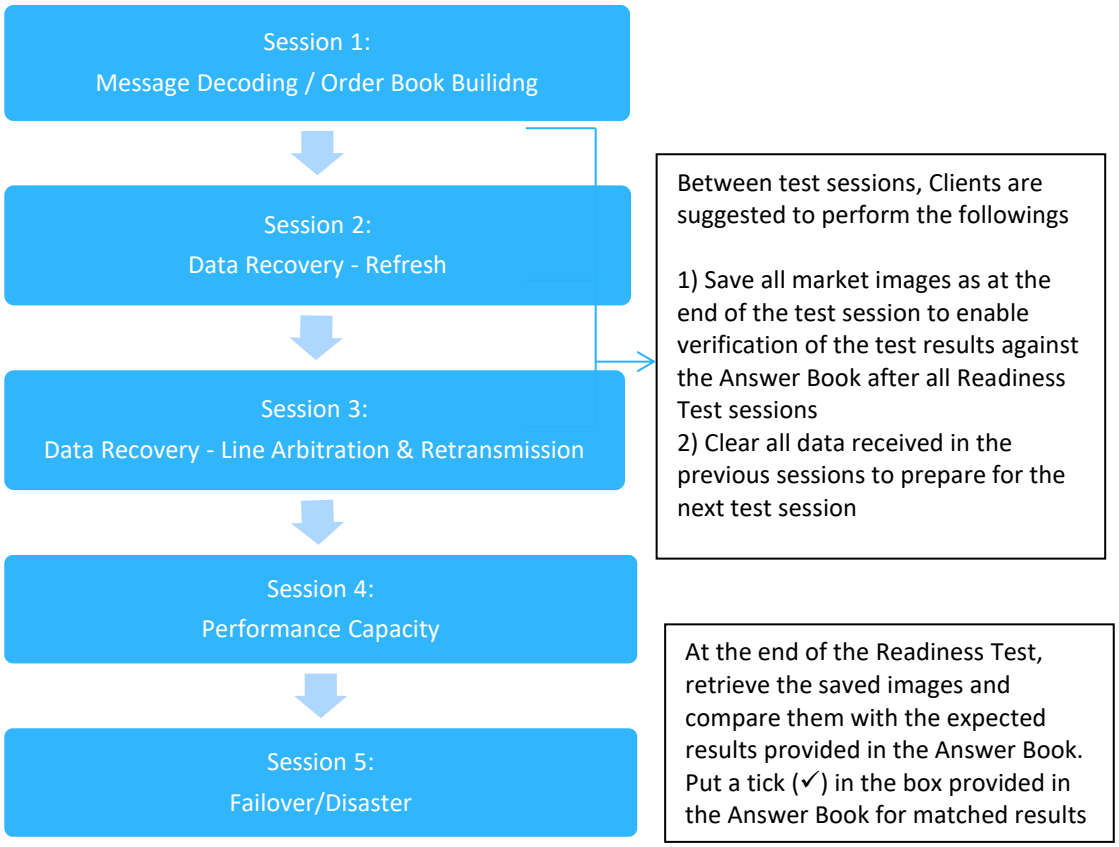
The Readiness Test will be conducted according to a test time table which covers all trading sessions (i.e. T & T+1 sessions). Clients should refer to the "Readiness Test Schedule and Rundown" for the actual test time tables with time set for each trading session status. Clients are required to conduct the Readiness Test according to the test time table.

There will be 5 test sessions arranged in the Readiness Test to cover the 5 test scopes as stated below. Clients will need to restart their applications, or clear the cached data between test sessions, as different data sets will be used for different sessions.

Before the commencement of the Readiness Test, Clients are required to refer to the latest Readiness Test Answer Book which covers details of messages and conditions to be checked in the 5 Readiness Test sessions and the expected results. By comparing the test results with the expected answers provided, Clients can verify their systems' readiness to proceed to the next on-boarding stage – OMD Market Rehearsal and declare their successful completion of the Readiness Test should their results match the expected results in the Answer Book without discrepancies.

The diagram below illustrates the flow in the Readiness Test (test sessions 1 to 5)

Readiness Test Flow Diagram



6 Scope of Test

The Readiness Test covers test cases in the following 5 areas:

Test Area	Objectives	Test Conditions
1. Message Decoding, Order Book Building & Active Instrument State ("AIS") Determination	All data messages specified in the OMD Interface Specification will be transmitted to enable Clients to ensure their correct interpretation of each data field received from the OMD datafeed.	Section 7.1 1 – 2
	Market status messages with various combinations will be disseminated to enable Clients to verify the logic in their application for determining the Active Series State of series	Section 7.1 2.6
	Data messages resulting from various trading activities will be transmitted to enable Clients to verify the logic in their application for order book management below: Market Depth Information — Applicable to Clients* Aggregate Order Book Update — DS DP D-Lite Add/Modify/Delete Order & Trade — DF D-Lite (Order Feed) * Notes: DS Derivatives Standard; DP Derivatives Premium; DF Derivatives FullTick; D-Lite Derivatives Lite	Section 7.1 2.9
2. Data Recovery (Refresh)	Simulation of various data loss scenarios to enable Clients to verify the ability of their feed handler to recover lost data by Refresh [1].	Section 7.2 3.3 – 3.4
3. Data Recovery (Line Arbitration & Retransmission)	Simulation of various data loss scenarios to enable Clients to verify the ability of their feed handler to recover lost data by the following methods: a. Line Arbitration b. Retransmission [1 2]	Section 7.2 3.1 - 3.2 4
4. Performance / Capacity	Transmission of high volume data to enable Clients to ensure the ability of their feed handler to meet the capacity requirements.	Section 7.2 5.1
5. Failover / Disaster Recovery	Simulation of the following exceptional scenarios to enable Clients to verify the built-in processes in their feed handlers for such scenarios: a. Failover of OMD real-time data publisher b. Failover of Refresh service c. Failover of Retransmission service d. Sequence Reset again before market open e. Failover to the Disaster Recovery (DR) site	Section 7.2 6.1 6.2 6.5 6.3 6.4

[1] Certain exception situations on the Clients side that may require refresh or retransmission from OMD such as late connection to OMD, application restart, client network failure, etc. are not expected to be conducted during the Readiness Test, Clients need to simulate the scenarios during the End-to-End Open Test environment.

[2] Clients are required to test their processing of negative logon response and negative retransmission response during the End-to-End Open Test environment which includes i) duplicated logon, ii) logon with invalid username, iii) retransmission request – invalid / unauthorized channel ID, iv) retransmission request – message range exceeding maximum OMD cached messages, v) retransmission request – message range exceeding maximum sequence range, and vi) retransmission request – exceeding daily retransmission request limit. Various retransmission request limits will be set to a sufficient small value to facilitate the Clients to test their capability in processing negative response from OMD.

7 Test Conditions

This section lists out the conditions to be covered in both functional and technical aspects. A Client should ensure that its system meets all of the test conditions before participating in the Readiness Test.

7.1 Functional Tests

Test Condition	Details	IS* Reference
1	***Handling of Control Messages***	
1.1	*Heartbeat* messages in all multicast channels in Line A and/or Line B *Expected result:* *Clients should be able to check system/line healthiness by Heartbeat messages*	Control Messages (3.4.1)
1.2	*Sequence Reset* messages in all multicast channels at Start of Day *Expected result:* *Upon receipt of Sequence Reset messages, Clients should clear all cached data, subscribe to the refresh channels for current market state then process (cached) real-time messages.*	Control Messages (3.4.2)
2	***Handling of Market Data Messages***	
2.1	*Commodity Definition* messages of selected tradable commodities	Reference Data (3.7.1)
2.2	*Class Definition* messages corresponding to the *Commodity Definition* available	Reference Data (3.7.2)
2.3	*Series Definition Base* messages corresponding to the *Class Definition* available	Reference Data (3.7.3)
2.4	*Series Definition Extended* messages corresponding to the *Class Definition* available and in most cases paired with *Series Definition Base* available	Reference Data (3.7.4)
2.5	*Combination Definition* messages corresponding to the *Series Definition Base* available	Reference Data (3.7.5)
2.6	*Market Status* messages to define various Trading Session State(TSS) and Instrument Session State (ISS) of instruments	Status Data (3.8.1)
2.7	*Series Status* messages to change suspension/resumption status for instruments	Status Data (3.8.2)
2.8	*Commodity Status* messages to change suspension/resumption status for commodities	Status Data (3.8.2)
2.9	A series of Order Book messages (*Add Order* & *Delete Order* & *Trade*) covering various book operations during various trading sessions in a normal trading day	Order Book Data (3.9.1, 3,9.3, 3.10.1)
2.10	*Aggregate Order Book Update* messages covering various aggregate book management operations	Order Book Data (3.9.4)

Test Condition	Details	IS* Reference
2.11	*Orderbook Clear* messages will be sent intraday	Order Book Data (3.9.5)
2.12	*Quote Request* messages will be sent intraday	Order Book Data (3.9.6)
2.13	*Trade/Trade Amendment* messages covering new trades, trade cancellation and trade rectification will be sent during various trading sessions in a normal trading day	Trade & Price Data (3.10.1, 3.10.2)
2.14	*Trade Statistics* messages covering T session and T+1 session will be transmitted	Trade & Price Data (3.10.3)
2.15	*Series Statistics* messages covering T session and T+1 session will be sent	Trade & Price Data (3.10.4)
2.16	*Calculated Opening Price* messages with null price and non-zero price will be sent	Trade & Price Data (3.10.5)
2.17	*Estimated Average Settlement Price* will be sent throughout the day	Trade & Price Data (3.10.6)
2.18	*Market Alert* will be sent	News (3.11.1)
2.19	Clearing Information including *Open Interest* and *Implied Volatility* will be sent intraday *Expected result:* • *Data field values decoded by Clients match the expected values provided in the Answer Book* • *Information of same series is updated correctly from various records including Series Definition Base, Series Definition Extended & Combination Definition (for combo series only)* • *Order Books (5BBO / 10BBO / 10BBO + remaining) maintained by Clients match the expected results provided in the Answer Book* • *Trade Records maintained by Clients match the expected results provided in the Answer Book* • *Active Instrument States derived by Clients match the expected results provided in the Answer Book* • *Trade Statistics for T and T+1 sessions are updated correctly by Clients and match the expected results provided in the Answer Book*	Clearing Information (3.12.1, 3.12.2)

7.2 Technical Tests

Test Condition	Details	IS* Reference
3	***Data Recovery***	
3.1	A gap will be introduced in a single line, either Line A or Line B. Client detects missing packets in one line and to process the packet from the other line, in other words, Client arbitrates and merges the duplicated contents received in Line A and Line B for subsequent processing *Expected Result:* *Clients are able to detect the gap in Line A and/or Line B. Clients are able to merge the duplicated messages from Line A and Line B for different sets of dual multicast channels for subsequent message decoding and processing and able to detect gaps in the multicast packets received. From there the Clients can arbitrate the two lines to fill in any gaps detected in any one of the two lines.*	Gap Detection (4.1) Line Arbitration (4.2)
3.2	A large gap will be introduced to both Line A and Line B expecting the Client to request the latest market state images from the refresh service. Client correctly processes the *Refresh Complete* message and applies it to their current cache of market data. *Expected Result:* *Clients are able to join the refresh channel and recover the latest market image up to the current point whilst processing real-time market data. The final image of specific series/indexes should match perfectly the expected results provided in the Answer Book.*	Refresh (3.6.1, 4.4)
4	***Retransmission Service***	
4.1	*Heartbeat* messages in retransmission service	Control Messages (3.4.1)
4.2	Client sends *Logon* message with valid username expecting OMD to respond with a *Logon Response* message with SessionStatus set to 0 (Session Active). Client processes *Logon Response* message. Test the reception of positive *Retransmission Response*: Client sends *Retransmission Request* message with valid channel ID and valid BeginSeqNum / EndSeqNum fields expecting OMD accepts its request with *Retransmission Response* set to 0 (Request accepted) RetransStatus if the messages requested will not exceed any retransmission system limits as stated in the OMD Interface Specifications	Retransmission (3.5.1, 3.5.2, 3.5.3, 4.3)

Test Condition	Details	IS* Reference
4.3	Client processes *Retransmission Response* message. Client processes the requested lost messages in unicast transmission following receipt of a positive *Retransmission Response* message and can fill in the gap detected in real-time multicast channels for the subsequent processing *Expected Result for Test Conditions 4.1 – 4.6:* *Clients are able to detect missing packets and are able to recover the missing messages from the retransmission server for continuation of real-time market data processing. The final image of specific series/indexes should match perfectly the expected results provided in the Answer Book*	Retransmission (3.5.4, 4.3)
5 5.1	***Performance / Capacity*** Market Data will be disseminated at increasing rates on all OMD datafeed products. Clients are expected to receive market data volume at a rate that will drive to the peak bandwidth requirements for each datafeed product. 1. 50% of maximum 2. 100% of maximum Clients must handle all rates without dropping data. The Answer Book will provide the Sequence Number of the last message. Clients should check their last Sequence Number that they receive against the provided number and make sure that there is no gap in the Sequence Number of messages received. *Expected Result:* *Clients are able to handle full capacity for all of their subscribed OMD datafeed products in the same set of SDNet/2 or HSN circuits without losing multicast data, which is a symptom of an overloaded link in a chain. The last Sequence Number received in each channel should be identical to the Sequence Number provided in this Answer Book. Also the final image of specific series/indexes should match perfectly the expected results provided in the Answer Book*	N/A Performance Testing

Test Condition	Details	IS* Reference
6	***Failover / Disaster Recovery***	
6.1	Failover of real-time Publisher process *Expected Result:* *Clients are able to handle Publisher failover without experiencing any interruption and can continue to receive real-time market data after the failover.* *The final image of specific series/indexes, in particular for DS Clients the aggregate order book and trade of specific series should match perfectly the expected results provided in the Answer Book.*	Error Recovery (2.2.4.1)
6.2	Failover of Refresh Service process *Expected Result:* *Clients will receive a Sequence Reset (100) message in each of the refresh channels after Refresh Service process (RFS) failover if they're subscribing to the refresh channels. Clients are expected to handle RFS failover properly without affecting the reception of real-time market data and can capture a full latest market image from RFS for their processing.* *The final image of specific series/indexes should match perfectly the expected results provided in the Answer Book*	Error Recovery (2.2.4.1)
6.3	Sending second sets of *Sequence Reset* messages in real-time multicast channels before market open *Expected Result:* *Clients will receive a Sequence Reset (100) message in each of the channels they subscribed before market open. Clients should be able to replace the previously received series information by the correct one received after the reception of this Sequence Reset (100). The final image of specific series/indexes should match perfectly the expected results provided in the Answer Book*	Control Message (3.4.2)
6.4	OMD simulates DR site failover *Expected Result:* *Clients are able to handle DR site failover gracefully including the handling of Disaster Recovery Signal (105) message, recovery from refresh service and merging of refresh image into real-time market data. The final image of specific securities/indexes, should match perfectly the expected results provided in the Answer Book.*	Error Recovery (2.2.4.2)

Test Condition	Details	IS* Reference
6.5	Primary Retransmission server will be stopped and only the secondary server remains operational. Clients are required to connect to the secondary and make retransmission requests.[3] *Expected Result:* *Clients are able to detect failure of Retransmission Server (RTS) A and auto-switch to reconnect to RTS B for the recovery of missing packets. The final image of specific series/indexes should match perfectly the expected results provided in the Answer Book*	Retransmission (3.5.3, 4.3)

* IS refers to the latest OMD Interface Specifications for Derivatives Market Datafeed Products – Binary Protocol.

[3] "Maximum Number of Request per Day" will be set to a sufficient small value (i.e. 10 as planned) in the Secondary Retransmission server during this test session to set the test conditions for the Clients to test their capability of processing negative retransmission response for exceeding daily retransmission request limit, Clients are required to make 10+ retransmission requests when connecting to the Secondary Retransmission server to verify that they can process negative response from OMD correctly.