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OPTIQ DERIVATIVES OEG CONFORMANCE: SBE AND FIX TEST SCRIPT

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PREFACE

PURPOSE

The purpose of this document is to provide customers with a description of the Optiq order entry conformance script, including scenarios for connectivity, functional data conformance and high availability tests for the Optiq Phase 3 of the migration of Euronext Derivatives markets to Optiq.

TARGET AUDIENCE

This document is particularly relevant to clients that will need to perform mandatory conformance tests on Optiq Derivatives order entry, i.e. :

- Member developers;
- Technology providers (Independent Software Vendors and Application Service Providers ASPs);
- Liquidity Provider trading members using an ISV/ASP provider solution.

WHAT'S NEW?

The following lists only the most recent modification made to this revision/version. For the Document History table, see the Appendix.

REVISION NO./ VERSION NO.	DATE	AUTHOR	CHANGE DESCRIPTION
1.4	04 Oct 2023	Euronext	Update version, added: Case 5.4 Stop Market order test case Case 5.5 Stop Limit order test case Case 5.10 Self trade prevention test case Case 5.10 Self trade prevention test case using STP ID Case 7.19 RFC test case Case 7.19 and Case 8.6 reminder that controls on trading capacity are in place

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1.3	26 Sep 2022	Euronext	-Added RiskGuard Controls
1.2	29 Oct 2019	Euronext	- Added Trading Chain Failures
1.1	17 Sep 2019	Euronext	- Case 4.26 corrected OrderCancelReject (9) to RequestAckMessage (Uy) for FIX. - Case 6.1 corrected Account Type set to 6 (Client) to Account Type set to 6 (Liquidity Provider) and added wording "and LPRole set to 1 (Liquidity Provider or Market Maker)". - Removed sentences "without new MIFID II fields". - Case 4.22 added Segmentation flags - Removed duplicate case (old 4.21) - Corrected 6.14 to reflect Quote Ack as response instead of Reject message. - Corrected 6.16 to reflect Quote Ack as response instead of Reject message.
1.0	23 Jul 2019	Euronext	First version

ASSOCIATED DOCUMENTS

The following lists the associated technical documents, which either should be read in conjunction with this document or which provide other relevant information for the user:

- Technical specifications (Phase 3: Cash OEG / ME & MDG)
  - Euronext Derivatives Markets – Optiq Kinematics Specifications
  - Euronext Markets – Optiq OEG Client Specifications – SBE Interface
  - Euronext Markets – Optiq OEG Client Specifications – FIX 5.0 Interface
  - Euronext Markets – Optiq MDG Client Specifications
  - Euronext Markets – Optiq & TCS Error List
  - Euronext Markets – Optiq File Specifications
  - Euronext Optiq Phase 3 Order Entry Gateway (OEG) and Matching Engine (ME) Conformance Test Details
  - Euronext Derivatives – How the Market Works

- Technical Inputs:
  - Euronext Markets – Optiq OEG SBE Template
  - Euronext Markets – Optiq MDG SBE Template

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CONTACT

Please find below the Optiq Support Desk contact details, which has been established to ensure customer readiness by:

- sending information to customers related to Optiq
- answering customers' questions related to Optiq
- assisting customers in their testing and validation on the EUA environment
- providing follow-up on customer conformance testing
- assessing customers' state of readiness with regards to technical changes

Optiq Migration Team
Email: optiqmigration@euronext.com

TEST SCENARIO EXCEPTION POLICY

Customers only need to complete the test cases relating to the functionality that they will use on the Live Services. If a customer's application does not support the functionality described in a particular test scenario and they do not intend to complete the scenario during the test, this must be agreed before the start of the certification test.

NON-CONFORMANT BEHAVIOR ON THE LIVE SERVICE

Any non-conformant behaviour by a customer's software application on the Live Services may lead to the software application being disconnected and not re-connected until it has been re-certified and the non-conformant behaviour corrected.

CONFORMANCE TEST GUIDELINES

The Certification Process is an integral part of the Certification Programme Mandatory testing will be required for all applications that wish to connect to the production environment and mandatory functions will need to be tested in order to confirm conformant behaviour.

Customers should consider their software application's 'production ready' before attempting the test. Customers should also read and familiarize themselves with this document and the Market and Product Specific Testing documents..

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Before Taking the Test

Before taking their conformance tests, Clients are required to thoroughly test the new or upgraded trading application's interaction, basic functionalities and connectivity on the Euronext External User Acceptance (EUA) platform by themselves.

Prior to conforming their software solutions, customers are required to have completed the following tasks:

1. Connect to the p-EUA environment using the connectivity guidelines document for support.
2. Develop, test and validate their software solution, using the specifications for support
3. Confirm successful connectivity to the new Exchange File Server (EFS) to access Standing Data Files
4. Request an appointment for the coordinate test part via the Connect portal

Customers should identify all test scenarios supported by their application and complete the full set of uncoordinated test cycles before booking through the webform a slot to complete the coordinated test cases with Optiq migration analyst.

- Full, partial and light conformance test must be booked in advance using the Conformance Booking Form.
- Clients who do not have to do a full, partial or light conformance, still need to confirm their readiness using the Self-certification webform

Scheduling an appointment with a Optiq Migration Analyst needs to be done at least two working days in advance via email. Conformance tests can take place at the following times:

Day	Time (CET)
Monday	9 am – 5 pm
Tuesday	9 am – 5 pm
Wednesday	2 pm – 5 pm
Thursday	9 am – 5 pm
Friday	9 am – 5 pm

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No conformance test will take place on Wednesday morning as the p-EUA platform is closed for maintenance until 13:00 CET

Optiq Migration analyst will confirm to the customers a time slot available and provide Optiq Certification Test Report.

Customers must identify the test scenarios supported by their application, by ticking the relevant boxes on the Optiq Certification Test Report and point out the test results providing all the details for each of the un-coordinated test cases by filling in the "Customer Comments" field available.

Optiq Certification Test Report must be sent to optiqmigration mailbox before the assisted slot assigned for coordinated test cases.

All test cases (both uncoordinated test cases and coordinated test cases performed with an Optiq migration analyst) must be completed within the same day.

Customers must perform all of the steps in each of the test scenarios and record the results in the relevant sections of the Optiq Certification Test Report

When documenting the test results, customers should include all information as requested in each of the steps, such as Order IDs, QuoteMsg IDs and Security IDs.

If the result does not match the expected result, the customer should still record it in the relevant section of the certification test report and in the comments section including the following:

- Order IDs/ QuoteMsg IDs (if any)
- Instrument ID
- Time of the order/quote/operation submission/execution

Unless a log off or disconnect request is specified in the test case the customer should complete all test cases without logging off or disconnecting. If there are any unexpected log offs or disconnects, these should be documented in the comments section of the certification test report.

When conformance tests do not require an appointment with an Optiq Analyst, Clients are required to:

• Test their application by following dedicated test script and

• Provide the results of the tests to Optiq migration team, usually through a web form on the Client's Connect interface.

Conformance testing are mandatory for Clients of Italian markets and for Clients of legacy

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Euronext markets only for new supported features on legacy markets (done as those features are delivered)

Clients of Italian markets

The following members and providers are required to perform a mandatory OEG full conformance test:

- New trading members accessing the Euronext Optiq® platform directly who are not yet certified on the Optiq platform
- Trading members using an in-house software which is already certified on the Optiq platform but is subject to a new release
- Software providers not yet certified on the Optiq platform The below table describes the types of conformance test applicable for the different types of members and providers:

The below table describes the types of conformance test applicable for the different types of members and providers:

Trading Members				
Already connected to Optiq	Using in-house software	Developing new features	Subject to new release*	**Full conformance**
			Not subject to new release*	**Partial conformance**
		Not developing new features		**Self-certification**
	Using third-party software			**Self-certification**
Not yet connected to Optiq	Using in-house software			**Full conformance**
	Using third-party software			**Light conformance**
ISVs and ASPs				
Already connected to Optiq		Developing new features	Subject to new release*	**Full conformance**
			Not subject to new release*	**Partial conformance**
		Not developing new features		**Self-certification**
Not yet connected to Optiq				**Full conformance**
Data Vendors				
All				**N/A** (MDG test only)

***New release:** change of protocol or general major software release

These tests are described in the table below:

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	Full Conformance	Partial Conformance	Light Conformance	Self-certification
Approach	Partially autonomously and partially live with a Euronext analyst. *Please book your conformance via the* **webform**		Live with a Euronext analyst for validation only (tests are done autonomously) *Please book your conformance via the* **webform**	Offline, autonomously
Scope	Execute for all member codes and all solutions a set of tests to confirm the Optiq protocol is correctly implemented and compliant with Euronext guidelines. Clients select the OEG features to certify during test.	Limited number of functional messages and/or features that are developed by the client		Limited number of functional messages

During the Test

During the conformance test, the Optiq analyst will guide and support customers through the different coordinated test cases.

Customers should save a copy of the test report as they will be required to use it during the test to record their test results.

Customers should record the test results on Optiq Certification Test Report will be the conformance scripts.

If the customer faces issues during the conformance test that are related to their development of the software, the Optiq analyst will end the conformance test and ask the customer to make a new conformance appointment once the software is developed and tested again

After the Test

Following the conformance test, the Optiq Analyst will review the results of each test script to ensure that the test steps within each test script have been completed correctly and match the anticipated results. Once these two requirements are complete, the Optiq Analyst will provide feedback to the Client. If the test is successful, the Client will receive a certificate including the results of the conformance test and certifying the test was successfully completed. If the test is unsuccessful, the Client will receive feedback on where the test failed and why. The Client will be expected to make the necessary changes to its trading application and to pass the failed part of the conformance test again. The Client may directly liaise with the Optiq Analyst if there is a perception that the issue causing the failure is linked to the conditions of the test environment.

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The following items are checked:

- The functional behaviour and message sequencing in each scenario
- If the session was maintained for the entire period or if it dropped
- If any errors were produced over the time period

SCOPE OF MESSAGES AND FUNCTIONALITIES

The following table describe each Optiq Segment tag. Each tag will be then used for each message to specify on which Optiq Segment this message applies to.

Optiq Segment	Tag
Equity Derivatives	EQD
Index Derivatives	IDD
Commodities	CMO

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TABLE OF CONTENTS

PREFACE..... 1

CONTACT..... 4

TEST SCENARIO EXCEPTION POLICY..... 4

NON-CONFORMANT BEHAVIOUR ON THE LIVE SERVICES..... 4

CONFORMANCE TEST GUIDELINES..... 4

BEFORE TAKING THE TEST..... 5

DURING THE TEST..... 8

AFTER THE TEST..... 8

TABLE OF CONTENTS..... 10

1. MDG LITE..... 11
2. SOFTWARE IDENTIFICATION..... 12
3. CLIENT ID ORDER MANAGEMENT..... 15
4. ADMINISTRATION MESSAGES..... 16
5. ORDER AND TRADE MANAGEMENT..... 21
6. STRATEGIES..... 46
7. MARKET MAKING (ORDERS, QUOTES, MMP, MM SIGN-IN) 50
8. WHOLESALES..... 59
9. TRADE PRICE VALIDATION..... 64
10. TRADING CHAIN FAILURES EQD IDD FID CMO..... 65
11. SUPPORT..... 73

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1. MDG Lite

1.1 MDG Lite - Logon

TEST CASE ID	**1.1**
REQUIRED MDG Login messages	**Logon (1)**
MANDATORY / OPTIONAL	**Mandatory for MDG Lite customers**
ASSISTED	**No**

Customer need to confirm that MDG Logon works properly

Instruction

Clients initiate a TCP/IP session to the MDG Lite Gateway, and then initiate a logon by sending the MDG Logon (1) message. The Logon (1) message must be the first message sent by the client otherwise the MDG Lite Gateway will drop the connection. The MDG Logon message includes a repeating group through which the client can specify a combination of MDG Lite feeds which intends to receive

Success Criteria

Customer confirm that logon works properly and they receiving market data

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2. Software Identification

2.1 IN HOUSE SOLUTION IDENTIFICATION

EQD	IDD	CMO

REQUIRED SBE MESSAGES	**Logon (100) Software Provider**
REQUIRED FIX MESSAGES	**Logon (A) SoftwareProvider (21050)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

The approach consists of populating a dedicated field called "*Software Provider*" that exists in both SBE and FIX OEG messages as follows:

For an In-house solution: To identify as being in house and provide transparency of versioning.

Instruction for SBE

The customer submits a **Logon** (100) message, making sure the field *Software Provider* will be filled using 8 characters in total, the three first Digits must be filled with Zeros and the remaining 5 characters must contain the versioning of your API solution.

0	0	0	Y	Y	Y	Y	Y

Success Criteria for SBE
The Optiq Analyst confirms a successful login, and validate the *Software Provider* field was populated.

A **Logon Ack** (101) message is sent by OEG providing the Exchange ID and the last message received from the client.

Instruction for FIX

The customer submits a **Logon** (A) message, making sure the field *SoftwareProvider* (21050) field will be filled using 8 characters in total, the three first Digits must be filled with Zeros and the remaining 5 characters must contain the versioning of your API solution.

0	0	0	Y	Y	Y	Y	Y

Success Criteria for FIX

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The Optiq Analyst confirms a successful login, and validate the *SoftwareProvider* (21050) field was populated.

A Logon (A) message is sent back by OEG providing the Exchange ID and the last message received from the client.

2.2 ISV SOLUTION IDENTIFICATION EQD IDD CMO

REQUIRED SBE MESSAGES	**Logon (100) Software provider**
REQUIRED FIX MESSAGES	**Logon (A) SoftwareProvider (21050)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

For an ISV solution: To identify the ISV provider and provide transparency of versioning.

The approach consists of populating a dedicated field called “Software Provider” that exists in both SBE and FIX OEG messages as follows:

Instruction for SBE

The customer submits a **Logon** (100) message, making sure the field Software Provider will be filled using 8 characters in total, the three first Digits must be filled with the appropriated prefix assigned by the Exchange and the remaining 5 characters must contain the versioning of your API solution.

X	X	X	Y	Y	Y	Y	Y

Success Criteria for SBE
The Optiq Analyst confirms a successful login, and validate the Software Provider Field was populated.

A **Logon Ack** (101) message is sent by OEG providing the Exchange ID and the last message received from the client.

Instruction for FIX

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The customer submits a **Logon** (A) message, making sure the field *Software Provider* (21050) will be filled using 8 characters in total, the three first Digits must be filled with the appropriated prefix* assigned by the Exchange and the remaining 5 characters must contain the versioning of your API solution.

X	X	X	Y	Y	Y	Y	Y

Success Criteria for FIX

The Optiq Analyst confirms a successful login, and validate the *SoftwareProvider* (21050) field was populated.

A **Logon** (A) message is sent back by OEG providing the Exchange ID and the last message received from the client.

Note: The dedicated prefix will be sent from Euronext CAS service XXX to Each ISV.
ISV prefix range from -001 to -213 as per 4 bytes decimal digit representation format (- 2,147,483,646 …-1).

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3. CLIENT ID ORDER MANAGEMENT

3.1 NEW ORDER EQD IDD CMO

REQUIRED SBE MESSAGES	**New Order (01);**
REQUIRED FIX MESSAGES	**NewOrderSingle (D);**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Depending on the nature of the client access, the *Client Order ID* must respect some constraints as described below.

Moreover it is recommended that clients implement their own configurable prefix in order to allow firms to integrate several application instances easily and ensure *Client Order ID* uniqueness across all the firm orders.

Regular Access: when a firm contracts its own and exclusive order entry access means directly with Euronext, the Firm Trading Solution type is Regular Access (or sometimes Direct Access):

- **Regular "In House" Accesses** (i.e. non via ISV): Must specify a *ClOrdID* value in the positive number range.
- **Regular Accesses via ISV**:
  - The ISV must specify a *ClOrdID* value in the negative number range with the unique 3- digit number prefix assigned by the exchange. Numerically it means that clients are restricted to a range from –XXX0000000000000000 to –XXX9999999999999999, where XXX is their ISV ID.
  - The correct use of the ISV ID and range is checked by the exchange during the conformance test, however afterwards the OEG will not perform any checks of the correct assignment of the ID or range in the inbound application message.
  - A dedicated prefix will be sent from Euronext CAS service XXX to Each ISV.
- **Instructions for SBE and FIX**: Customer sends order with valid prefix in the client order id field.
- **Success Criteria for SBE and FIX**: Optiq Analyst confirms that field Client Order Id / ClOrdID (tag 11) has the correct prefix
- a. Optiq Analyst confirms ClOrdID has a negative value.
- b. Optiq Analyst confirms ClOrdID has the correct prefix.

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4. ADMINISTRATION MESSAGES

4.1 LOGON EQD IDD CMO

REQUIRED SBE MESSAGES	**Logon (100)**
REQUIRED FIX MESSAGES	**Logon (A)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Instruction for SBE

The customer submits a valid and correctly formatted Logon message to log into their OEG session with the following fields for **SBE**:

- *Logical Access ID* - *OE Partition ID*
- *Last Message Sequence Number*: For the first connection of the day it should be set to zero (0). However, it will be the Sequence Number of the last message received by the client from the Exchange on a specific OE session.
- *Software Provider* (Mandatory for customers using a software Provider) - *Queuing Indicator* set to 0 or 1

Success Criteria for SBE

The Optiq Analyst confirms a successful login, this consists of a logon and then a logon confirmation. A **Logon Ack** (101) message is sent by OEG providing the Exchange ID and the last message received from the client.

Instruction for FIX

The customer submits a valid and correctly formatted Logon message to log into their OEG session with the following fields for **FIX:**

- *LogicalAccessID* (21021)
- *OEPartitionID* (21019)
- *NextExpectedMsgSeqNum* (789): for the first connection of the day it must be 1. However it will be the sequence number of the last message received by the client from Exchange on a specific OEG session.
- *SoftwareProvider* (21050) – (Mandatory for customers using a software Provider)
- *QueueingIndicator* (21020) = 0 or 1
- *DefaultApplVerID* (1137) = 9
- *EncryptMethod* (98) = 0

Success Criteria for FIX

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The Optiq Analyst confirms a successful login. A **Logon** (A) message is sent back by OEG with the sequence number of the last message received from the client.

4.2 LOGON REJECT EQD IDD CMO

REQUIRED SBE MESSAGES	**Logon Reject (102)**
REQUIRED FIX MESSAGES	**Reject (3)**
MANDATORY / OPTIONAL	**Mandatory**
ASSISTED	**No**

Instructions for SBE:

1- The customer initiates an OEG session with a wrong Logical Access ID.
2- The customer initiates an OEG session with Queueing Indicator not sent / set.
3- The customer try to logon with a *LogicalAccessID* which is already connected.
4- The customer try to logon with a *LastSequenceNumber* much higher than last sent by OEG.

Success Criteria for SBE:

1- Logon is rejected with *Logon Reject Code* = 1 (Unknown Connection Identifier)
2- Logon is rejected with *Logon Reject Code* = 7 (Invalid Logon format)
3- Logon is rejected with *Logon Reject Code* = 4 (Client session already logged on)
4- Logon is rejected with *Logon Reject Code* = 3 (Invalid sequence number) and Last Sequence Number field set to a given value. Then client sends his next logon where *LastSequenceNumber* is populated with a sequence number less or equal to this given value and he is able to logon successfully.

Instructions for FIX:

1- The customer initiates an OEG session with invalid Tag number.
2- The customer initiates an OEG session with required Tag missing
3- The customer initiates an OEG session with field *NextExpectedMsgSeqNum* (789) set to a much higher value than last sent by OEG

Success Criteria for FIX:

1- Logon is rejected with *SessionRejectReason* (373) = 0 (Invalid Tag number)
2- Logon is rejected with *SessionRejectReason* (373) = 1 (Required Tag is missing)
3- Logon is rejected with *SessionRejectReason* (373) = 10 (*ReceivedNextExpectedMsgSeqNum* (789) is too high) and *LastMsgSeqNumProcessed* (369) field set to a given value. Then client sends his next logon where the field *NextExpectedMsgSeqNum* (789) is populated with a sequence number less or equal to this given value and he is able to logon successfully.

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4.3 HEARTBEAT EQD IDD CMO

REQUIRED SBE MESSAGES	**HeartBeat (106)**
REQUIRED FIX MESSAGES	**HeartBeat (0)**
MANDATORY / OPTIONAL	**Mandatory**
ASSISTED	**No**

Instructions for SBE: the customer should send a **Logon** (100) message and make sure that to send heartbeats to the exchange.

Success Criteria for SBE: the customer confirms regular Heartbeats are received according to the "Delay of Inactivity" defined by the exchange for the Optiq segment.

Instructions for FIX: The customer should confirm the *HeartBInt* (108) setting is the same as in their **Logon** (A) message, and corresponds to the value defined by the exchange for the Optiq segment.

Success Criteria for FIX: The customer confirms regular Heartbeats are received according to the HeartBInt setting defined by the exchange for the Optiq segment.

4.4 RESEND REQUEST EQD IDD CMO

REQUIRED SBE MESSAGES	**N/A**
REQUIRED FIX MESSAGES	**ResendRequest (2)**
MANDATORY / OPTIONAL	**Mandatory for FIX protocol only**
ASSISTED	**No**

Instruction: the customer submits a valid and correctly formatted **Resend Request** (2) message with a nominated Begin and End Seq number.

Success Criteria: the Exchange resends messages, the customer confirms successful receipt of messages.

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4.5 SEQUENCE RESET EQD IDD CMO

REQUIRED SBE MESSAGES	**N/A**
REQUIRED FIX MESSAGES	**SequenceReset (4)**
MANDATORY / OPTIONAL	**Mandatory for FIX protocol only**
ASSISTED	**No**

Instruction: If possible, the customer submits a valid and correctly formatted **Sequence Reset** (4) by setting *GapFillFlag* (123) to 'Y'. The value in the *NewSeqNo* (36) will always represent the *MsgSeqNum* of the next message that by the Market.

Success Criteria: Optiq Analyst confirms successful receipt of a valid and correctly formatted **Sequence Reset** (4).

4.6 TEST REQUEST EQD IDD CMO

REQUIRED SBE MESSAGES	**TestRequest (107)**
REQUIRED FIX MESSAGES	**TestRequest (1)**
MANDATORY / OPTIONAL	**Mandatory**
ASSISTED	**No**

Instruction for SBE: the customer submits a **Test Request** (107) message.

Success Criteria for SBE: the Exchange receives the Test Request. The Exchange will automatically reply with a **HeartBeat** (106) message. The customer confirms receipt of Heartbeat message.

Instruction for FIX: the customer submits a **Test Request** (1) message.

Success Criteria for FIX: the Exchange receives the Test Request. The Exchange will automatically reply with a **HeartBeat** (0) message. The customer confirms receipt of Heartbeat with the expected *TestReqID* (112).

4.7 LOGOUT EQD IDD CMO

REQUIRED SBE MESSAGES	**Logout (103)**
REQUIRED FIX MESSAGES	**Logout (5)**

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MANDATORY / OPTIONAL	**Mandatory**
ASSISTED	**No**

Instructions for SBE:

a. The customer submits a valid and correctly formatted **Logout** (103) message to log out the OEG session, with field *Log Out Reason Code* = 0
b. The customer tries to logon with a *LogicalAccessID* which is already connected.

Success Criteria for SBE:

a. The customer submits a valid and correctly formatted **Logout** (103) message to log out the OEG session.
   Optiq Analyst confirms the customer is successfully logged out.
b. *SessionStatus* = 103 (Client session already logged on).

Instructions for FIX:

a. The customer submits a valid and correctly formatted **Logout** (5) message to log out the OEG session, with *SessionStatus* (1409) set to 100 (Regular Logout by client).
b. The customer tries to logon with a *LogicalAccessID* which is already connected.

Success Criteria for FIX:

a. The customer confirms receipt of a valid **Logout** (5) message with *SessionStatus* = 4 (Session logout complete). Optiq Analyst confirms the customer is successfully logged out.
b. The customer confirms receipt of a valid **logout** (5) message with *SessionStatus* = 103 (Client session already logged on).

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5. ORDER AND TRADE MANAGEMENT

5.1 NEW ORDER

EQD IDD CMO

REQUIRED SBE MESSAGES	**New Order (01); Ack (03)**
REQUIRED FIX MESSAGES	**NewOrderSingle (D); ExecutionReport (8)**
MANDATORY / OPTIONAL	**Mandatory**
ASSISTED	**No**

Instructions for SBE: the customer submits a valid and correctly formatted new BUY order message, with all mandatory and conditional MIFID II fields properly populated.

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of an **Ack** (03) message for the BUY order with *Ack Type*= 0 (New Order Ack).

Instructions for FIX: the Customer submits a valid and correctly formatted BUY new order message, with all mandatory and conditional MIFID II fields properly populated.

Success Criteria for FIX: the customer confirms the receipt and correct interpretation of an **ExecutionReport** (8) message for the BUY order with *ExecType* (150) = 0 (New) and *OrdStatus* (39) = 0 (New).

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5.2 NEW ORDER - CLIENT ACCOUNT EQD IDD CMO

REQUIRED SBE MESSAGES	**New Order (01); Ack (03)**
REQUIRED FIX MESSAGES	**NewOrderSingle (D); ExecutionReport (8)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Instructions for SBE: the customer submits a valid and correctly formatted new BUY order message, with all mandatory and conditional MIFID II fields properly populated and *Account Type* set to 1 = Client.

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of an **Ack** (03) message for the BUY order with *Ack Type* = 0 (New Order Ack).

Instructions for FIX: the Customer submits a valid and correctly formatted BUY new order messages, with all mandatory and conditional MIFID II fields properly populated and *Account Code* (6399) set to 1 = Client.

Success Criteria for FIX

ExecutionReport (8) message for the BUY order with *ExecType* (150) = 0 (New) and *OrdStatus* (39) = 0 (New)

5.3 NEW ORDER - HOUSE ACCOUNT EQD IDD CMO

REQUIRED SBE MESSAGES	**New Order (01); Ack (03)**
REQUIRED FIX MESSAGES	**NewOrderSingle (D); ExecutionReport (8)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Instructions for SBE: the customer submits a valid and correctly formatted new BUY order message, with all mandatory and conditional MIFID II fields properly populated and *Account Type* set to 2 = House.

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of an **Ack** (03) message for the BUY order with *Ack Type* = 0 (New Order Ack).

Instructions for FIX: the Customer submits a valid and correctly formatted BUY new order messages, with all mandatory and conditional MIFID II fields properly populated and *Account Code* (6399) set to 2 = House.

Success Criteria for FIX: the customer confirms the receipt and correct interpretation of an

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ExecutionReport (8) message for the BUY order with *ExecType* (150) = 0 (New) and *OrdStatus* (39) = 0 (New).

5.4 STOP MARKET EQD IDD CMO

TEST CASE ID	**4.3 B**
REQUIRED SBE MESSAGES	**New Order (01); Order Type = 3 (Stop-market)**
REQUIRED FIX MESSAGES	**NewOrderSingle (D); OrdType (Tag 40) = 3 (Stop-market)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**Yes**

Instruction for SBE:

a. The customer submits a valid and correctly formatted New Order, with Order Type=3 (Stop-market);TimeInForce set to 0 (Day); and Stop Trigger Price = <user defined>).
b. Optiq Analyst will make a trade in the instrument that will trigger the customers stop order.

Success Criteria for SBE:

a. The customer confirms the receipt and correct interpretation of the Ack (03) with Ack Type set to 0 (New Order Ack), followed by
b. A Fill (04) message when the stop order is triggered for any trades that occurs and then an order Ack Type set to 3 (Stop Triggered Ack

Instruction for FIX:

a. The customer submits a valid and correctly formatted New Order with OrdType (Tag 40) set to 3 (Stop- market); TimeInForce (Tag 59) set to 0 (Day) and StopPx (Tag 99) = <user defined>.
b. Optiq Analyst will make a trade in the instrument that will trigger the customers stop order.

Success Criteria for FIX:

a. The customer confirms the receipt and correct interpretation of the ExecutionReport (8) message for Acknowledgment of a new order follows by An ExecutionReport with ExecType (150) set to 2 (Fill) and then another ExecutionReport(8) with OrderStatus (39) set to S (Stop Triggered Ack).

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5.5 STOP LIMIT EQD IDD CMO

TEST CASE ID	**4.3 C**
REQUIRED SBE MESSAGES	**New Order (01) ; Order Type = 4 (Stop-limit)**
REQUIRED FIX MESSAGES	**OrdType (Tag 40) = 4 (Stop limit)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**Yes**

Instructions for SBE:

a. The customer submits a valid and correctly formatted New Order , with Order Type=4 (Stop-limit); Time In Force set to 0 (Day); and Stop Trigger Price = <user defined>).

b. Optiq Analyst will make a trade in the instrument that will trigger the customers stop order.

Success Criteria SBE:

a. The customer confirms the receipt and correct interpretation of the

a. Ack (03) with Ack Type set to 0 (New Order Ack), followed by
b. A Fill (04) message when the stop order is triggered for any trades that occurs and then an order Ack Type set to 3 (Stop Triggered Ack)

Instructions for FIX:

a. The customer submits a valid and correctly formatted Stop Limit Order with OrdType (Tag 40) set to 4 (Stop-limit); TimeInForce (Tag 59) set to 0 (Day); and StopPx (Tag 99) = <user defined>.

b. Optiq Analyst will make a trade in the instrument that will trigger the customers stop order.

Success Criteria FIX:

a. The customer confirms the receipt and correct interpretation of the ExecutionReport (8) message for Acknowledgment of a new order follows by
b. An ExecutionReport with ExecType (150) set to 2 (Fill) and then another ExecutionReport(8) with OrderStatus (39) set to S (Stop Triggered Ack).

5.6 TRADE – FULL EXECUTION EQD IDD CMO

REQUIRED SBE MESSAGES	**New Order (01); Fill (04)**
REQUIRED FIX MESSAGES	**NewOrderSingle (D); Execution Report (8)**
MANDATORY / OPTIONAL	**Mandatory**
ASSISTED	**Yes**

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Instructions for SBE: the customer submits a valid and correctly formatted new SELL order message. An Optiq analyst will match the order entered by the client in order to generate a Full execution.

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of the **Fill** (04) message.

Instruction for FIX: the customer submits a valid and correctly formatted new SELL order message. An Optiq analyst will match the order entered by the client in order to generate a Full execution.

Success Criteria for FIX

ExecutionReport (8) message with *ExecType* (150) = F Trade (Partial Fill or Fill) and *OrdStatus* (39) = 2 Filled

5.7 TRADE – PARTIAL EXECUTION

EQD IDD CMO

REQUIRED SBE MESSAGES	**New Order (01); Fill (04)**
REQUIRED FIX MESSAGES	**NewOrderSingle (D); Execution Report (8)**
MANDATORY / OPTIONAL	**Mandatory**
ASSISTED	**Yes**

Instructions for SBE: the customer submits a valid and correctly formatted new SELL order message. An Optiq analyst will match the order entered by the client in order to generate a Partial execution.

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of the **Fill** (04) message.

Instruction for FIX: the customer submits a valid and correctly formatted new SELL order message. An Optiq analyst will match the order entered by the client in order to generate a Partial execution.

Success Criteria for FIX: the customer confirms the receipt and correct interpretation of an **ExecutionReport** (8) message with *ExecType* (150) = F (Trade (Partial Fill or Fill)) and *OrdStatus* (39) = 1 (Partially Filled).

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5.8 TRADE CANCELLATION – INITIATED BY THE EXCHANGE EQD IDD CMO

REQUIRED SBE MESSAGES	**Trade Bust notification (19)**
REQUIRED FIX MESSAGES	**ExecutionReport (8)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**Yes**

Instructions for SBE: an Optiq analyst will cancel a previously matched trade.

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of the **Trade Bust notification** (19) message.

Instruction for FIX: an Optiq analyst will cancel a previously matched trade.

Success Criteria for FIX

ExecutionReport (8) message with *ExecType* (150) = H Cancel Trade and *OrdStatus* (39) = H (Trade Cancellation).

5.9 ORDER CANCELLATION – INITIATED BY THE EXCHANGE EQD IDD CMO

REQUIRED SBE MESSAGES	**Kill (05)**
REQUIRED FIX MESSAGES	**ExecutionReport (8)**
MANDATORY / OPTIONAL	**Mandatory**
ASSISTED	**Yes**

Instructions for SBE: Optiq analyst will cancel one of the customer's orders.

Success Criteria for SBE: The customer confirms the receipt and correct interpretation of **Kill** (05) message with *Kill Reason* = 3 (Order Cancelled by Market Operations).

Instruction for FIX: Optiq analyst will cancel one of the customer's orders.

Success Criteria for FIX: The customer confirms the receipt and correct interpretation of the **ExecutionReport** (8) message with *ExecType* (150) = U (Order Cancelled by Market Operations) and *OrdStatus* (39) = 4 (Cancelled).

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5.10 SELF-TRADE PREVENTION EQD IDD CMO

TEST CASE ID	**4.7 B**
REQUIRED SBE MESSAGES	**New Order (01)**
REQUIRED FIX MESSAGES	**NewOrderSingle (D)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Instruction SBE:

a. Client submits a valid and correctly formatted Buy Order and a correctly formatted Sell order where Execution instruction position zero (0) set to 1 (Cancel resting order)

b. Client submits a valid and correctly formatted Buy Order and a correctly formatted Sell order where Execution instruction position one (1) set to 1 (Cancel Incoming order)

Success Criteria SBE:

a. The customer confirms the receipt and correct interpretation of

- Ack (03) message acknowledging the first Buy order, followed by
- Two messages being sent at the same time
    - Kill (05) message for cancellation of the first Buy order with Kill Reason set to 7 (Cancelled by STP)
    - Ack (03) message acknowledging entry of the Sell order

into the book Kill message with kill reason=7 (Cancel by STP).

b. The customer confirms the receipt and correct interpretation of Reject (07) message with the Error Code
"2179" (Incoming order cancelled due to STP type of Cancel Incoming order).

Instruction FIX:

a. Client submits a valid and correctly formatted Buy Order and a correctly formatted Sell order where both orders have STPAggressorIndicator set to 0 (Cancel resting order) and STP ID set to 03.

b. Client submits a valid and correctly formatted Buy Order and a correctly formatted Sell order where both orders have STPAggressorIndicator set to 1 (Cancel incoming order) and STP ID set to 04.

Success Criteria for FIX:

- ExecutionReport (8) message acknowledging the first Buy order, followed by
- Two messages being sent at the same time

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- ExecutionReport (8) message for cancellation of the first Buy order with ExecType (tag 150) set to 4 (Cancelled) and OrdStatus (tag 39) set to P (Cancelled by STP), and
- ExecutionReport (8) message acknowledging entry of the Sell order into the book

b. The customer confirms the receipt and correct interpretation of the OrderCancelReject (9) message with Error Code (tag 9955) set as “2179” (Incoming order cancelled due to STP type of Cancel Incoming order).

5.10B STP with STP ID EQD IDD CMO

TEST CASE ID	**5.10 B**
REQUIRED SBE MESSAGES	**New Order (01)**
REQUIRED FIX MESSAGES	**NewOrderSingle (D)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Same step as 5.10 test case, client can send also STP ID value

5.11 DAY ORDER EQD IDD CMO

REQUIRED SBE MESSAGES	**New Order (01); Time In Force = 0 (Day)**
REQUIRED FIX MESSAGES	**NewOrderSingle (D); TimeInForce (Tag 59) = 0 (Day)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Instructions for SBE: the customer submits a valid and correctly formatted Day Order with *Time In Force* field set to 0 (Day)

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of the **Ack** (03) message, with *Ack Type* set to 0 (New Order Ack).

Instructions for FIX: the customer submits a valid and correctly formatted Day Order with *Time In Force* (59) field set to 0 (Day)

Success Criteria for FIX: the customer confirms the receipt and correct interpretation of the **ExecutionReport** (8) messages with *ExecType* (150) and *OrdStatus* (39) set to 0 (New).

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5.12 GOOD TILL CANCEL ORDER EQD IDD CMO

REQUIRED SBE MESSAGES	**New Order (01); Order Type = 2 (Limit); Time In Force = 1 (Good Till Cancel)**
REQUIRED FIX MESSAGES	**NewOrderSingle (D); OrdType (Tag 40) = 2 (Limit); TimeInForce (Tag 59) = 1 (Good Till Cancel (GTC))**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Instruction for SBE: the customer submits a valid and correctly formatted Good Till Cancel Order.

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of the **Ack** (03) message.

Instruction for FIX: the customer submits a valid and correctly formatted Good Till Cancel Order.

Success Criteria for FIX: the customer confirms the receipt and correct interpretation of the **ExecutionReport** (8) message.

5.13 GOOD TILL DATE ORDER EQD IDD CMO

REQUIRED SBE MESSAGES	**New Order (01); Order Type = 2 (Limit); Time In Force = 6 (Good till Date)**
REQUIRED FIX MESSAGES	**NewOrderSingle (D); OrdType (Tag 40) = 2 (Limit); TimeInForce (Tag 59) = 6 (Good till Date (GTD)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Instruction for SBE: the customer submits a valid and correctly formatted Good Till Date Order with *Time In Force* set to 6 (Good till Date), with the *Order Expiration Date* field completed.

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Success Criteria for SBE: the customer confirms the receipt and correct interpretation of the **Ack** (03) message.

Instruction for FIX: the customer submits a valid and correctly formatted Good Till Date Order with *Time In Force* (59) set to 6 (Good till Date), with the order *ExpireDate* (432) field completed.

Success Criteria for FIX: the customer confirms the receipt and correct interpretation of the **ExecutionReport** (8) message.

5.14 MARKET ORDER

EQD IDD CMO

REQUIRED SBE MESSAGES	**New Order (01); Order Type = 1 (Market); Time in Force = 3 or 4 (IOC / FOK)**
REQUIRED FIX MESSAGES	**NewOrderSingle (D); OrdType (Tag 40) = 1 (Market); TimeInForce (Tag 59) = 3 (Immediate or Cancel (IOC) or 4 (Fill Or Kill)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Instructions for SBE: the customer submits a valid and correctly formatted **New Order** (01) message with *Order Type* = 1 (Market) and *Time In Force* = 3 or 4 (IOC or FOK) in a selected instrument for each of the following conditions:

a. Market order does not trade as there is an empty book
b. Market order partially trades with an active order
c. Market order fully trades with an active order.

Success Criteria for SBE:

a. The customer confirms the receipt and correct interpretation of the following message:
- **Reject** (07) message with field *Error Code* set to "2028" = No shares available (IOC/FOK/MinQty)

b. The customer confirms the receipt and correct interpretation of the following messages:
- **Ack** (03) message for new order and Cancelation messages
- **Fill** (04) message for execution of partial quantity
- **Kill** (05) message with field Kill Reason set to 8 (Remaining quantity killed (IOC))

c. The customer confirms the receipt and correct interpretation of the following messages:
- **Ack** (03) message for the new order with *Ack Type* set to 0 (New Order Ack)
- **Fill** (04) message for the full execution

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Instructions for FIX: The customer submits a valid and correctly formatted **NewOrderSingle** (D) message with *OrdType* (40) = 1 (Market) and *TimeInForce* (59) = 3 or 4 (IOC or FOK) in a selected instrument where the order book is empty.

a. Market order does not trade as there is an empty book

b. Market order partially trades with an active order

c. Market order fully trades with an active order.

Success Criteria for FIX:

a. The customer confirms the receipt and correct interpretation of the **ExecutionReport** (8) message:

- The customer confirms the receipt and correct interpretation of the **ExecutionReport** (8) message with *ErrorCode* (9955) = 2028 (No shares available (IOC/FOK/MinQty))

b. The customer confirms the receipt and correct interpretation of three **ExecutionReport** (8) messages:

- first for the acknowledgement of a new order with *OrdStatus* (39) and ExecType (150) set to 0 (New), and
- second for the execution of the partial quantity with *OrdStatus* (39) and ExecType (150) set to 1 (Partially filled), and
- third for the cancelation of the remaining quantity with *OrdStatus* (39) set to 4 (Cancelled) and *ExecType* (150) set to X (Remaining quantity killed (IOC)).

c. The customer confirms the receipt and correct interpretation of two **ExecutionReport** (8) messages:

- first for the acknowledgement of a new order with *OrdStatus* (39) and *ExecType* (150) set to 0 (New), and
- second for Execution of the full quantity, with *OrdStatus* (39) and *ExecType* (150) set to 2 (Filled).

5.15 IMMEDIATE OR CANCEL LIMIT ORDER FQD IDD CMO

REQUIRED SBE MESSAGES	**New Order (01); Order Type = 2 (Limit); Time In Force = 3 (Immediate or Cancel)**
REQUIRED FIX MESSAGES	**NewOrderSingle (D); OrdType (Tag 40) = 2 (Limit); TimeInForce (Tag 59) = 3 (Immediate or Cancel (IOC)**
MANDATORY / OPTIONAL	**Optional**

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ASSISTED	**No**

Instructions for SBE: the customer submits a valid and correctly formatted IOC Limit order with *Time In Force* set to 3 (Immediate or Cancel) for each of the following conditions:

a. IOC order does not trade as there is no quantity to trade against
b. IOC order partially trades with an active order
c. IOC order fully trades with an active order.

Success Criteria for SBE:
a. The customer confirms the receipt and correct interpretation of the following message:
- **Reject** (07) message with field *Error Code* set to "2028" = No shares available (IOC/FOK/MinQty)

b. The customer confirms the receipt and correct interpretation of the following messages:
- **Ack** (03) message for new order and Cancelation messages
- **Fill** (04) message for execution of partial quantity
- **Kill** (05) message with field Kill Reason set to 8 (Remaining quantity killed (IOC))

c. The customer confirms the receipt and correct interpretation of the following messages:
- **Ack** (03) message for the new order with *Ack Type* set to 0 (New Order Ack)
- **Fill** (04) message for the full execution

Instructions for FIX: the customer submits a valid and correctly formatted IOC Limit order with *Time In Force* (59) set to 3 (Immediate or Cancel) for each of the following conditions:

a. IOC order does not trade as there is no quantity to trade against
b. IOC order partially trades with an active order
c. IOC order fully trades with an active order.

Success Criteria for FIX:
a. The customer confirms the receipt and correct interpretation of the **ExecutionReport** (8) message:
- Rejection of the complete quantity with *OrdStatus* (39) set to 8 (Rejected) and *ExecType* (150) set to 8 (Rejected), and with field *ErrorCode* (9955) set to "2028" = No shares available (IOC/FOK/MinQty)

b. The customer confirms the receipt and correct interpretation of three **ExecutionReport** (8) messages:
- first for the acknowledgement of a new order with *OrdStatus* (39) and *ExecType* (150) set to 0 (New), and
- second for the execution of the partial quantity with *OrdStatus* (39) and *ExecType* (150) set to 1 (Partially filled), and

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- third for the cancelation of the remaining quantity with *OrdStatus* (39) set to 4 (Cancelled) and *ExecType* (150) set to X (Remaining quantity killed (IOC)).

c. The customer confirms the receipt and correct interpretation of two **ExecutionReport** (8) messages:

- first for the acknowledgement of a new order with *OrdStatus* (39) and *ExecType* (150) set to 0 (New), and
- second for Execution of the full quantity, with *OrdStatus* (39) and *ExecType* (150) set to 2 (Filled).

5.16 FILL OR KILL ORDER EQD IDD CMO

REQUIRED SBE MESSAGES	**New Order (01); Order Type = 2 (Limit); Time In Force = 4 (Fill or Kill)**
REQUIRED FIX MESSAGES	**NewOrderSingle (D); OrdType (Tag 40) = 2 (Limit); TimeInForce (Tag 59) = 4 (Fill or Kill)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Instruction for SBE: the customer submits a valid and correctly formatted Fill Or Kill (FOK) order with *Time In Force* set to 4 (Fill or Kill) for each of the following conditions: a. FOK Order successfully trades with an active order.

b. FOK Order fails to trade with an active order by sending a FOK in an empty book.

Success Criteria for SBE:

a. The customer confirms the receipt and correct interpretation of the **Ack** (03) message, then a **Fill** (04) message following the trade execution.

b. The customer confirms the receipt and correct interpretation of the **Reject** (07) message field *Error Code* set to “2028” = No shares available (IOC/FOK/MinQty)

Instruction for FIX: the customer submits a valid and correctly formatted Fill Or Kill (FOK) order with *Time In Force* (59) set to 4 (Fill or Kill) for each of the following conditions: a. FOK Order successfully trades with an active order.

b. FOK Order fails to trade with an active order by sending a FOK in an empty book.

Success Criteria for FIX:

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a. The customer confirms the receipt and correct interpretation of an initial **ExecutionReport** (8) message acknowledging the order, then a further **ExecutionReport** (8) message following the trade execution.

b. The customer confirms the receipt of the **ExecutionReport** (8) message with *OrdStatus* (39) set to 8 (Rejected) with field *ErrorCode* (9955) = "2028" No shares available (IOC/FOK/MinQty)

5.17 MIN QTY ORDER EQD IDD CMO

REQUIRED SBE MESSAGES	**New Order (01); Order Type = 2 (Limit); Minimum Order Quantity set**
REQUIRED FIX MESSAGES	**NewOrderSingle (D); OrdType (Tag 40) = 2 (Limit); MinQty (Tag 110) set**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Instructions for SBE: The customer submits a valid and correctly formatted **New Order** (01) message, with *Order Type* set as 2 (Limit); TimeInForce as 0 (Day); *Minimum Order Quantity* = <user defined>, in a selected instrument for each of the following conditions:

a. There is sufficient qty in the market to satisfy the minimum order quantity requirement.

b. There is not sufficient qty in the market to satisfy the minimum order quantity requirement.

Success Criteria for SBE:

a. The customer confirms the receipt and correct interpretation of **Ack** (03) message followed by a **Fill** (04) message for the trade execution

b. The customer confirms their order is rejected, with **Reject** (07) message, and Error Code set as "2028" (No shares available (IOC/FOK/MinQty))

Instruction for FIX: The customer submits a valid and correctly formatted **NewOrderSingle** (D) message with *OrdType* (40) set as 2 (Limit); *TimeInForce* (59) set as 0 (Day) and *MinQty* (110) = <user defined> in a selected instrument for each of the following conditions:

a. There is sufficient qty in the market to satisfy the minimum order quantity requirement.

b. There is not sufficient qty in the market to satisfy the minimum order quantity requirement.

Success Criteria for FIX:

a. The customer confirms the receipt and correct interpretation of an initial **ExecutionReport** (8) message and then an **ExecutionReport** (8) message following the trade execution b. The customer's order is rejected

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5.18 CANCEL REPLACE – PRICE ONLY EQD DD CMO

REQUIRED SBE MESSAGES	**Cancel/Replace (06); Price = <price>**
REQUIRED FIX MESSAGES	**OrderCancelReplaceRequest (G); Price (Tag 44) = <price>**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Instructions for SBE:

a. The client submits a proper formatted Cancel Replace Request message which updates the price of an existing order.

b. The client submits a proper formatted Cancel Replace Request message which updates the price of an order already executed or cancelled. Make sure the required fields and, where applicable, the conditionally required fields are populated.

Success Criteria for SBE:

a. The customer confirms the receipt and correct interpretation of the **Ack** (03) message.

b. The customer confirms the receipt and correct interpretation of the **Reject** (07) message.

Instructions for FIX:

a. The client submits a proper formatted Cancel Replace Request message which updates the price of an existing order.

b. The client submits a proper formatted Cancel Replace Request message which updates the price of an order already executed or cancelled.

Make sure the required fields and, where applicable, the conditionally required fields are populated.

Success Criteria for FIX:

a. The customer confirms the receipt and correct interpretation an **ExecutionReport** (8) messages which should indicate the change of price.

b. The client confirms the receipt and correct interpretation of the **OrderCancelReject** (9) message.

5.19 CANCEL REPLACE – QUANTITY ONLY EQD DD CMO

REQUIRED SBE MESSAGES	**OrderCancel Replace (06); OrderQty = <quantity>**
REQUIRED FIX MESSAGES	**OrderCancelReplaceRequest (G); (Tag 38) = <quantity>**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

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Instructions for SBE: The customer submits a valid and correctly formatted Order Cancel/Replace Request message which updates the Quantity of an active order.

Success Criteria for SBE: The customer confirms the receipt and correct interpretation of the **Ack** (03) message, which should contain the change of quantity.

Instructions for FIX: The customer submits a valid and correctly formatted Order Cancel/Replace Request message which updates the Quantity of an active order

Success Criteria for FIX: The customer confirms the receipt and correct interpretation of the **ExecutionReport** (8) messages, which should indicate the change of quantity.

5.20 CANCEL REQUEST – INDIVIDUAL ORDER EQD IDD CMO

REQUIRED SBE MESSAGES	**Cancel Request (12)**
REQUIRED FIX MESSAGES	**OrderCancelRequest (F)**
MANDATORY / OPTIONAL	**Mandatory**
ASSISTED	**No**

Instructions for SBE: The customer submits a valid and correctly formatted **Cancel Request** (12) message for a single order.

Success Criteria SBE: The customer confirms the receipt and correct interpretation of the **Kill** (05) message identifying cancellation of the order.

Instructions for FIX: The customer submits a valid and correctly formatted **OrderCancelRequest** (F) message for a single order.

Success Criteria for FIX: The customer confirms the receipt and correct interpretation of the **ExecutionReport** (8) message identifying cancellation of the order.

5.21 CANCEL REQUEST – REJECT EQD IDD CMO

REQUIRED SBE MESSAGES	**Cancel Request (12)**
REQUIRED FIX MESSAGES	**OrderCancelRequest (F)**
MANDATORY / OPTIONAL	**Optional**

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ASSISTED	**No**

Instruction for SBE: The customer submits a vald and correctly formatted Order Cancel Request for a single order for an order already filled or cancelled.

Success Criteria SBE: The customer confirms the receipt and correct interpretation of the **Reject** (07) message with *Error Code* set to "2101" (Unknown Order).

Instruction for FIX: The customer submits a valid and correctly formatted **OrderCancelRequest** (F) for a single order for an order already filled or cancelled.

Success Criteria FIX: The customer confirms the receipt and correct interpretation of the **OrderCancelReject** (9) message with the *ErrorCode* (9955) set to "2101" (Unknown Order).

5.22 ORDER MASS CANCELATION – BY CONTRACT EQD IDD CMO

REQUIRED SBE MESSAGES	**Mass Cancel (13); Mass Cancel Ack (14)**
REQUIRED FIX MESSAGES	**OrderMassCancelRequest (q)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Instruction for SBE: The customer submits a valid and correctly formatted **Mass Cancel** (13) to cancel multiple orders for a given contract. The field Symbol Index has to be populated with Contract Symbol Index.

Success Criteria for SBE: The customer confirms the receipt and correct interpretation of two **MassCancelAck** (14) messages, and **Kill** (05) messages for every order cancelled.

Instruction for FIX: The customer submits a valid and correctly formatted **OrderMassCancelRequest** (q) to cancel multiple orders for a given instrument. *MassCancelRequestType* (530) must be se to '3' (cancel orders for a product and the *SecurityID* (48) must be populated with the Symbol Index of the contract concerned.
Success Criteria for FIX: The customer confirms the receipt and correct interpretation of two **OrderMassCancelReport** (r) messages, and **ExecutionReport** (8) messages between the first and second report messages for every order cancelled.

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5.23 ORDER MASS CANCELATION – BY SHORTCODE EQD DD CMO

REQUIRED SBE MESSAGES	**Mass Cancel (13); Mass Cancel Ack (14)**
REQUIRED FIX MESSAGES	**OrderMassCancelRequest (q); OrderMassCancelReport (r)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Instruction for SBE: The customer submits two valid orders in the same instrument to the order book each having a different *ExecutionWithinFirmShortcode* and then submits a valid and correctly formatted **Mass Cancel** (13) to cancel multiple orders for the specific instrument. The field *TargetExecutionWithinFirmShortCode* has to be populated with one of the *ExecutionWithinFirmShortCode* of one of the orders.

Success Criteria for SBE: The customer confirms the receipt and correct interpretation of two **MassCancelAck** (14) messages, and **Kill** (05) messages for every order cancelled that included the defined shortcode.

Instruction for FIX: The customer submits two valid orders to the order book each having a different value for *Execution Within Firm Short Code* in the field *TargetPartyID* (21095). Then the customer submits a valid and correctly formatted Mass Cancel Request to cancel multiple orders for a given instrument. *TargetPartyID* (21095*)* must be set to one of the values for *Execution Within Firm Short Code* of one of the orders

Success Criteria for FIX: The customer confirms the receipt and correct interpretation of two **OrderMassCancelReport** (r) messages, and **ExecutionReport** (8) messages between the first and second report messages for every order cancelled that included the defined shortcode.

5.24 ORDER EXPIRY – DAY ORDER EQD DD CMO

REQUIRED SBE MESSAGES	**New Order (01)**
REQUIRED FIX MESSAGES	**NewOrderSingle (D)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

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Instruction for SBE: The customer submits a Day order with *Time In Force* set to 0 (Day) in a selected instrument. At the end of the trading session the order will be cancelled.

Success Criteria for SBE: The customer confirms the receipt and correct interpretation of the expired order at the end of the trading session via the **Kill** (04) message – "Done for Day".

Instruction for FIX: The customer submits a Day order with *Time In Force* set to 0 (Day) in a selected instrument. At the end of the trading session the order will be cancelled.

Success Criteria for FIX: The customer confirms the receipt and correct interpretation of the expired orders at the end of the trading session via the **ExecutionReport** (8) message.

5.25 CANCEL ON DISCONNECT – DEACTIVATED EQD IDD CMO

REQUIRED SBE MESSAGES	**New Order (01)**
REQUIRED FIX MESSAGES	**NewOrderSingle (D)**
MANDATORY / OPTIONAL	**Mandatory**
ASSISTED	**No**

Instruction for SBE: the customer submits a valid and correctly formatted order with field *Execution Instruction* set to 3 (Disabled Cancel On Disconnect Indicator), then the client disconnects the OEG session.

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of the **Ack** (03) message. The order remains in the book.

Instruction for FIX: the customer submits a valid and correctly formatted order with field *CancelOnDisconnectionIndicator* (21018) = 1 (Order not in the scope of Cancel On Disconnect), then the client disconnects the OEG session.

Success Criteria for FIX: the customer confirms the receipt and correct interpretation of an **ExecutionReport** (8) message. The order will remain in the book.

5.26 CANCEL ON DISCONNECT – ACTIVATED EQD IDD CMO

REQUIRED SBE MESSAGES	**New Order (01)**

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REQUIRED FIX MESSAGES	**NewOrderSingle (D)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Instruction for SBE: the customer submits a valid and correctly formatted order with field *Execution Instruction* set to 0 (Disabled Cancel On Disconnect Indicator), then the client will disconnect the OEG session.

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of the **Ack** (03) message. The order will be killed due to Cancel On Disconnect.

Instruction for FIX: the customer submits a valid and correctly formatted order with *CancelOnDisconnectionIndicator* (21018) = 0 (per Default Configuration), then the client disconnects the OEG session.

Success Criteria for FIX: the customer confirms the receipt and correct interpretation of an **ExecutionReport** (8) message. The order will be killed due to Cancel On Disconnect.

5.27 OWNERSHIP REQUEST EQD IDD CMO

REQUIRED SBE MESSAGES	**Ownership Request (18); Ownership Request Ack (17)**
REQUIRED FIX MESSAGES	**OwnershipRequest (U18); OwnershipRequestAck (U29)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Instructions for SBE and FIX: the customer sends orders with a *LogicalAccessID* "A" and performs an Ownership Request with a *LogicalAccessID* "B" belonging to the same Firm, in order to define *LogicalAccessID* "B" as ones that will all Outbound messages associated to the targeted orders.

Success Criteria SBE: the customer confirms the receipt and correct interpretation of:

a) First **OwnershipRequestAck** (17) message with the total Affected Orders set to -1 and repeats all the fields as they were submitted in message (18)
b) Ack (03) message per order affected, if any. All such Ack messages will have the *Ack Type* set to 15 (Ownership Request Ack)
c) Second **OwnershipRequestAck** (17) message with the total *Affected Orders* set to the number of orders affected, which should be the same as the number of **Ack** (03) messages received.

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Success Criteria FIX: The customer confirms the receipt and correct interpretation of two **Ownership Request Ack** (U29) messages, and **ExecutionReport** (8) messages if any orders are present in the book.

a) First message has *TotalAffectedOrders* (533) set to -1 and repeats all fields as they were submitted.
b) Then the client may receive an **ExecutionReport** (8) message per order affected by the command, if any. All such **ExecutionReport** (8) messages have the *ExecType* (150) set to k (OwnershipRequest Ack).
c) Second message is received when the ownership request is totally processed, indicating the number of orders affected, which should be the same as the number of **ExecutionReport** (8) messages received.

5.28 STATUS OF TARGET ORDERS EQD IDD CMO

REQUIRED SBE MESSAGES	**Open Order Request (15)**
REQUIRED FIX MESSAGES	**OrderMassStatusRequest (AF)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Instructions for SBE:

a. The customer submits a valid and correctly formatted **Open Request Order** (15)
b. The customer submits a valid and correctly formatted **Open Request Order** (15) on empty book.

Success Criteria for SBE:

a. The customer confirms the receipt and correct interpretation of **Ack** (03) message with *Ack Type* = 17 (Open Order Request Ack).
b. The customer confirms the receipt and correct interpretation of **Reject** (07) message.

Instructions for FIX:

a. The customer submits a valid and correctly formatted **OrderMassStatusrequest** (AF) message.
b. The customer submits a valid and correctly formatted **OrderMassStatusrequest** (AF) message on empty book

Success Criteria for FIX:

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a. The customer confirms the receipt and correct interpretation of **ExecutionReport** (8) message with *ExecType* (150) set to l (OrderMassStatusRequest Ack)
b. The customer confirms the receipt and correct interpretation of **RequestAckMessage** (Uy) message (field *ErrorCode* (9955) = '2101' - 'Unknown Order').

5.29 USER NOTIFICATION EQD IDD CMO

REQUIRED SBE MESSAGES	**User Notification (39)**
REQUIRED FIX MESSAGES	**UserNotification (CB)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**Yes**

Instruction for SBE: to ensure the result of this test it is advised to have at least two or more working orders. The Exchange will perform Kill switch for the client's firm, algorithm, trader or Sponsored Access to suspend or kill the member or trader access to the trading system.

Success Criteria for SBE: the client will confirm receipt of a **User Notification** (39) message with field User Status identifying the case that triggers the request, and supporting fields providing the granularity

of the Kill. This should be followed by receipt of **Kill** (05) messages cancelling any open orders for the granularity identified.

Instruction for FIX: to ensure the result of this test it is advised to have at least two or more working orders. The Exchange will perform Kill switch for the client's firm, algorithm, trader or Sponsored Access to suspend or kill the member or trader access to the trading system.

Success Criteria for FIX: the client will confirm the receipt of a **UserNotification** (CB) message with *User Status* (926) identifying the case that triggers the request, and supporting fields providing the granularity of the Kill. This should be followed by receipt of **ExecutionReport** (8) messages cancelling any open orders for the granularity identified.

5.30 RiskGuard Controls EQD IDD CMO

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REQUIRED SBE MESSAGES	**N/A**
REQUIRED FIX MESSAGES	**ERGCommand(U68); ERGCommandAck(U69); GetRiskControls(U70); RiskControlDetails(U71)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Instructions for FIX: the Customer submits valid and correctly formatted **ERGCommand** messages, with all applicable fields properly populated.

Risk Control Type	Granularity	Referential scope	Description	Identifier field involved
Suspend	Firm	N/A	Authorizations for trading of a given Firm, Logical Access, Trader or Algorithm (identified via the short codes) has been suspended. Cancellation of the remaining open orders may be triggered depending on the setting specified in field Purge (21100)	TargetFirmID (21098)
	Logical Access	N/A		TargetLogicalAccessID
	ExecutionWithinFirmCode	N/A		TargetPartyID (21095)
	ClientIdentifactionShortCode	N/A		TargetClientShortCode
Unsuspend	Firm	N/A	The authorizations for trading, of a given Firm, Logical Access, Trader or Algorithm (identified via the short codes), have been restored	TargetFirmID (21098)
	Logical Access	N/A		TargetLogicalAccessID
	ExecutionWithinFirmCode	N/A		TargetPartyID (21095)
	ClientIdentifactionShortCode	N/A		TargetClientShortCode
Block	Firm	Contract	Access of a given Firm, Logical Access, Trader or Algorithm (identified via the short codes) to a given Contract has been blocked. Cancellation of the remaining open orders in the identified Contract may be triggered depending on the setting specified in field Purge (21100).	TargetFirmID (21098)
	Logical Access	Contract		TargetLogicalAccessID
	ExecutionWithinFirmCode	Contract		TargetPartyID (21095)
	ClientIdentifactionShortCode	Contract		TargetClientShortCode
Unblock	Firm	Contract	The authorizations for trading, of a given Firm, Logical Access. Trader or Algorithm (identified via the short codes), on a given Contract has been unblocked (or restored)	TargetFirmID (21098)
	Logical Access	Contract		TargetLogicalAccessID
	ExecutionWithinFirmCode	Contract		TargetPartyID (21095)
	ClientIdentifactionShortCode	Contract		TargetClientShortCode

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Order Size Limit	Firm	Contract	Order Size Limit control has been Activated or Deactivated for a given Firm on a given Contract. When activated, this limit is verified for each individual order message and not as cumulative value for all submitted orders. Activation or Deactivation is specified in the OSLFlag (21101).	TargetFirmID (21098)

Success Criteria for FIX: the customer confirms the receipt and correct interpretation of an **ERGCommandAck (U69)** message with AckStatus (5711) set to '0' (Accept).

Instructions for FIX: the Customer submits valid and correctly formatted **GetRiskControls** messages, with all applicable fields properly populated.

	Granularity	Description	Identifier field provided
Get Risk Controls	Firm	Returns Risk Control Details per given granularity	TargetFirmID (21098)
	Logical Access		TargetFirmID (21098) and TargetLogicalAccessID
	ExecutionWithinFirmShortCode		TargetFirmID (21098) and TargetPartyID (21095)
	ClientIdentificationShortCode		TargetFirmID (21098) and TargetClientShortCode

Success Criteria for FIX: Receive **RiskControlDetails (U71)** message containing available details of the controls currently setup by that risk manager and the AckStatus (5711) is set to '0' (Accept)

Note: The user notification message sent to risk controlled entities as result of a **ERGCommandAck** are not in scope of this conformance. That message is part of the FIX and SBE conformance tests before this.

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6. STRATEGIES

6.1 SECURITY DEFINITION REQUEST FUTURES EQD IDD CMO

REQUIRED SBE MESSAGES	**Security Definition Request (60); Security Definition Ack (61)**
REQUIRED FIX MESSAGES	**SecurityDefinitionRequest (c); SecurityDefinition (d)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Instructions for SBE/FIX:

a. Create a spread in a given futures contract.

b. Create a butterfly in a given futures contract.

c. Try to create a strategy other than a predefined one (rejection)

Success Criteria for SBE:

a. the customer confirms the receipt and correct interpretation of an **Security Definition Ack** (61)
b. the customer confirms the receipt and correct interpretation of an **Security Definition Ack** (61)
c. the customer confirms the receipt and correct interpretation of a **Reject** (07) for an invalid strategy definition code.

Success Criteria for FIX:

a. the customer confirms the receipt and correct interpretation of a **SecurityDefinition** (d) message
b. the customer confirms the receipt and correct interpretation of a **SecurityDefinition** (d) message
c. the customer confirms the receipt and correct interpretation of a **SecurityDefinition** (d) for an invalid strategy definition code with *ErrorCode* (9955) indicating the specific error code.

6.2 SECURITY DEFINITION REQUEST OPTIONS EQD IDD CMO

REQUIRED SBE MESSAGES	**Security Definition Request (60); Security Definition Ack (61)**
REQUIRED FIX MESSAGES	**SecurityDefinitionRequest (c); SecurityDefinition (d)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Instructions for SBE/FIX:

a. Create a spread in a given options contract.

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b. Create a butterfly in a given options contract.

c. ~~Create a Delta Neutral/Volatility strategy with an underlying futures contract.~~

d. ~~Create a Delta Neutral/Volatility strategy with an underlying cash instrument.~~

d. Try to create a strategy other than a predefined one (rejection)

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of a Security **Definition Ack** (61) message for each created strategy and a **Reject** (07) for an invalid strategy definition code.

Success Criteria for FIX: the customer confirms the receipt and correct interpretation of an **SecurityDefinition** (d) message for each created strategy and a **SecurityDefinition** (d) for an invalid strategy definition code with *ErrorCode* (9955) indicating the specific error code.

6.3 STRATEGIES NEW ORDER EQD IDD CMO

REQUIRED SBE MESSAGES	**New Order (01); Ack (03)**
REQUIRED FIX MESSAGES	**NewOrderSingle (D); Execution Report (8)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Instructions for SBE: the customer submits a valid and correctly formatted new BUY order message in one of the created strategies, with all mandatory and conditional MIFID II fields properly populated.

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of an **Ack** (03) message for the BUY order with *Ack Type* = 0 (New Order Ack).

Instructions for FIX: the Customer submits a valid and correctly formatted BUY new order messages, with all mandatory and conditional MIFID II fields properly populated.

Success Criteria for FIX: the customer confirms the receipt and correct interpretation of an **ExecutionReport** (8) message for the BUY order with *ExecType* (150) = 0 (New) and *OrdStatus* (39) = 0 (New).

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6.4 STRATEGIES TRADE EQD IDD CMO

REQUIRED SBE MESSAGES	**New Order (01); Ack (03); Fill (04)**
REQUIRED FIX MESSAGES	**NewOrderSingle (D); Execution Report (8)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**Yes**

Instructions for SBE: the customer submits a valid and correctly formatted new BUY order message in one of the created strategies, with all mandatory and conditional MIFID II fields properly populated.

An Optiq analyst will fully execute the submitted order.
Success Criteria for SBE: the customer confirms the receipt and correct interpretation of an **Ack** (03) message for the BUY order with *Ack Type* = 0 (New Order Ack) followed by a **Fill** (03) message for the execution.

Instructions for FIX: the Customer submits a valid and correctly formatted BUY new order message in one of the created strategies, with all mandatory and conditional MIFID II fields properly populated.

An Optiq analyst will fully execute the submitted order.

Success Criteria for FIX: the customer confirms the receipt and correct interpretation of an **ExecutionReport** (8) message for the BUY order with *ExecType* (150) = 0 (New) and *OrdStatus* (39) = 0 (New) followed by a **ExecutionReport** (8) message for the execution.

6.5 STRATEGY – TRADE BUST NOTIFICATION SINGLE LEG EQD IDD CMO

REQUIRED SBE MESSAGES	**Trade Bust notification (19)**
REQUIRED FIX MESSAGES	**Execution Report (8)**
MANDATORY / OPTIONAL	**Yes**
ASSISTED	**Yes**

Instructions for SBE: an Optiq analyst will cancel a previously matched trade leg of a strategy.

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of the **Trade Bust notification** (19) message for the cancelled leg.

Instruction for FIX: an Optiq analyst will cancel a previously matched trade leg of a strategy.

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Success Criteria for FIX: the customer confirms the receipt and correct interpretation of an **Executionreport** (8) message with *ExecType* (150) = H and *OrdStatus* (39) = H (Trade Cancellation) for the cancelled leg.

6.6 STRATEGY – TRADE BUST NOTIFICATION COMPLETE STRATEGY EQD DD CMO

REQUIRED SBE MESSAGES	**Trade Bust notification (19)**
REQUIRED FIX MESSAGES	**Execution Report (8)**
MANDATORY / OPTIONAL	**Yes**
ASSISTED	**Yes**

Instructions for SBE: an Optiq analyst will cancel all legs of a matched strategy

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of the **Trade Bust notification** (19) message for all legs of the strategy.

Instruction for FIX: an Optiq analyst will cancel all legs of a matched strategy.

Success Criteria for FIX: the customer confirms the receipt and correct interpretation of an **ExecutionReport** (8) message with *ExecType* (150) = H and *OrdStatus* (39) = H (Trade Cancellation) for each cancelled leg.

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7. MARKET MAKING (ORDERS, QUOTES, MMP, MM SIGN-IN)

7.1 NEW ORDER – LIQUIDITY PROVIDER ACCOUNT EQD IDD CMO

REQUIRED SBE MESSAGES	**New Order (01); Ack (03)**
REQUIRED FIX MESSAGES	**NewOrderSingle (D); ExecutionReport (8)**
MANDATORY / OPTIONAL	**Yes for Market Makers**
ASSISTED	**No**

Instructions for SBE: the customer submits a valid and correctly formatted new BUY order message, with all mandatory and conditional MIFID II fields properly populated and *Account Type* set to 6 (Liquidity Provider) and *LPRole* set to 1 (Liquidity Provider or Market Maker).

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of an **Ack** (03) message for the BUY order with *Ack Type* = 0 (New Order Ack).

Instructions for FIX: the Customer submits a valid and correctly formatted BUY new order messages, with all mandatory and conditional MIFID II fields properly populated and *Account Code* (6399) set to 6 (Liquidity Provider) and *LPRole* (20021) set to 1 (Liquidity Provider or Market Maker).

Success Criteria for FIX: the customer confirms the receipt and correct interpretation of an **ExecutionReport** (8) message for the BUY order with *ExecType* (150) = 0 (New) and *OrdStatus* (39) = 0 (New)
.

7.2 MARKET MAKER SIGN IN EQD IDD CMO

REQUIRED SBE MESSAGES	**MM Sign-In (47); MM Sign-In Ack (48)**
REQUIRED FIX MESSAGES	**N/A (SBE only)**
MANDATORY / OPTIONAL	**Yes for Market Makers**
ASSISTED	**No**

Instructions for SBE: the customer submits a valid and correctly formatted **MM Sign-in** (47) message, with all mandatory and conditional MIFID II fields properly populated.

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Success Criteria for SBE: the customer confirms the receipt and correct interpretation of an **MM Sign-In Ack** (48) message

7.3 MM PROTECTION REQUEST SET DELTA PROTECTION EQD IDD CMO

REQUIRED SBE MESSAGES	**MM Protection Request (62); MM Protection Ack (63)**
REQUIRED FIX MESSAGES	**N/A (SBE only)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Instructions for SBE: the customer submits a valid and correctly formatted new **MM Protection Request** (62) message in a dedicated contract where MM rights are enabled, with:

a) Request Type set to 1 = Set
b) Protection Type set to 1 = Delta
c) Protection Threshold set to 1000
d) Breach Action set to 1 = Pull

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of a **MM Protection Ack** (63) message.

7.4 QUOTES EQD IDD CMO

REQUIRED SBE MESSAGES	**Quotes (08); Quote Ack (09)**
REQUIRED FIX MESSAGES	**N/A (SBE only)**
MANDATORY / OPTIONAL	**Yes for Market Makers**
ASSISTED	**No**

Instructions for SBE: the customer submits a valid and correctly formatted new **Quotes** (08) message in an instrument of choice with quantity set to 100 for both sides.

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of a **Quote Ack** (09) message with *Buy Revision Indicator* = 0 (New) and *Sell Revision Indicator* = 0 (New).

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7.5 QUOTES - ADJUST QUANTITY EQD IDD CMO

REQUIRED SBE MESSAGES	**Quotes (08); Quote Ack (09)**
REQUIRED FIX MESSAGES	**N/A (SBE only)**
MANDATORY / OPTIONAL	**Yes for Market Makers**
ASSISTED	**No**

Instructions for SBE: the customer submits a valid and correctly formatted new **Quotes** (08) message in an instrument of choice with quantity set to 95 for both sides and then adjusts the quantity to 100 for both sides.

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of a **Quote Ack** (09) message for the initial quote and a second one for the updated quote with *Buy Revision Indicator* = 1 (Replacement) and *Sell Revision Indicator* = 1 (Replacement).

7.6 QUOTES - ADJUST PRICE EQD IDD CMO

REQUIRED SBE MESSAGES	**Quotes (08); Quote Ack (09)**
REQUIRED FIX MESSAGES	**N/A (SBE only)**
MANDATORY / OPTIONAL	**Yes for Market Makers**
ASSISTED	**No**

Instructions for SBE: the customer submits a valid and correctly formatted new **Quotes** (08) message in an instrument of choice with quantity set to 100 for both sides and then adjusts the price for both sides up or down respecting the minimum tick size.

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of a **Quote Ack** (09) message for the initial quote and a second one for the updated quote with *Buy Revision Indicator* = 1 (Replacement) and *Sell Revision Indicator* = 1 (Replacement).

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7.7 QUOTES - TRADE EQD IDD CMO

REQUIRED SBE MESSAGES	**Quotes (08); Quote Ack (09)**
REQUIRED FIX MESSAGES	**N/A (SBE only)**
MANDATORY / OPTIONAL	**Yes for Market Makers**
ASSISTED	**Yes**

An Optiq analyst will execute 5 lots on one side of a quote.

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of a **Fill** (04) message.

7.8 QUOTES - ADJUST QUANTITY ON PARTIAL FILL EQD IDD CMO

REQUIRED SBE MESSAGES	**Quotes (08); Quote Ack (09)**
REQUIRED FIX MESSAGES	**N/A (SBE only)**
MANDATORY / OPTIONAL	**Yes for Market Makers**
ASSISTED	**No**

Instructions for SBE: the customer submits a valid and correctly formatted **Quotes** (08) message on the partially executed quote and adjusts the quantity to 100 for both sides.

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of a **Quote Ack** (09) message for the updated quote with quantity 100

7.9 MM PROTECTION REQUEST - GET DELTA PROTECTION EQD DD CMO

REQUIRED SBE MESSAGES	**MM Protection Request (62); MM Protection Ack (63)**
REQUIRED FIX MESSAGES	**N/A**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Instructions for SBE: the customer submits a valid and correctly formatted new **MM Protection Request** (62) message.

a) Request Type set to 2 = Get

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Success Criteria for SBE: the customer confirms the receipt and correct interpretation of a **MM Protection Ack** (63) message with the adjusted *Current MMP Position* being the difference between the initial value of 1000 and 5 times the delta traded.

7.10 QUOTES TRADE FOR MMP BREACH EQD DD CMO

REQUIRED SBE MESSAGES	**Quotes (08); Quote Ack (09)**
REQUIRED FIX MESSAGES	**N/A**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**Yes**

An Optiq analyst will execute the remaining 95 lots of the quote to trigger a Breach Action

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of a **Fill** (04) message and a **Kill** (05) message for the other side of the quote with *Kill Reason* = 23 (Order cancelled due to Market Maker Protection)

7.11 MM PROTECTION REQUEST SET VOLUME PROTECTION EQD DD CMO

REQUIRED SBE MESSAGES	**Quotes (08); Quote Ack (09)**
REQUIRED FIX MESSAGES	**N/A**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Repeat Step 6.4 to 6.9

Instructions for SBE: the customer submits a valid and correctly formatted new **MM Protection Request** (62) message in a dedicated contract where MM rights are enabled, with:

a) Request Type set to 1 = Set
b) Protection Type set to 2 = Volume
c) Protection Threshold set to 10000
d) Breach Action set to 1 = Pull

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of a **MM Protection Ack** (63) message.

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7.12 QUOTES CANCEL BY MM EQD IDD CMO

REQUIRED SBE MESSAGES	**Quotes (08); Quote Ack (09)**
REQUIRED FIX MESSAGES	**N/A (SBE only)**
MANDATORY / OPTIONAL	**Yes for Market Makers**
ASSISTED	**No**

Instructions for SBE: the customer submits a valid and correctly formatted new **Quotes** (08) message in an instrument of choice with quantity set to 100 for both sides and then adjusts the quantity to 0 for both sides.

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of a **Quote Ack** (09) message for the initial quote and a second one for the cancelled quote with *Buy Revision Indicator* = 1 (Cancellation) and *Sell Revision Indicator* = 1 (Cancellation).

7.13 QUOTES CANCEL BY EXCHANGE EQD IDD CMO

REQUIRED SBE MESSAGES	**Quotes (08); Quote Ack (09)**
REQUIRED FIX MESSAGES	**N/A (SBE only)**
MANDATORY / OPTIONAL	**Yes for Market Makers**
ASSISTED	**Yes**

Instructions for SBE: the customer submits a valid and correctly formatted new **Quotes** (08) message in an instrument of choice with quantity set to 100 for both sides. An Optiq analyst will cancel one of the quotes.

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of a **Quote Ack** (09) message for the initial quote and then for the cancellation of the quote.

7.14 QUOTES MULTIPLE CONTRACTS – REJECT EQD IDD CMO

REQUIRED SBE MESSAGES	**Quotes (08); Quote Ack (09)**
REQUIRED FIX MESSAGES	**N/A (SBE only)**
MANDATORY / OPTIONAL	**Yes for Market Makers**

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ASSISTED	**No**

Instructions for SBE: the customer submits a **Quotes** (08) message including at least two quotes for instruments each belonging to a different Contract. Customer must be Market Maker on the contract of the first quote.

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of a **Quote Ack** (09) with the first quote accepted, while the second quote returns Bid Error Code / Ask Error Code with the appropriate error code.

7.15 QUOTES MULTIPLE INSTRUMENTS EQD IDD CMO

REQUIRED SBE MESSAGES	**Quotes (08); Quote Ack (09)**
REQUIRED FIX MESSAGES	**N/A (SBE only)**
MANDATORY / OPTIONAL	**Yes for Market Makers**
ASSISTED	**No**

Instructions for SBE: the customer submits a **Quotes** (08) message including at least two quotes for instruments belonging to the same Contract.

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of a **Quote Ack** (09) for each quote belonging to the different instruments.

7.16 QUOTES REJECT EQD IDD CMO

REQUIRED SBE MESSAGES	**Quotes (08); Quote Ack (09)**
REQUIRED FIX MESSAGES	**N/A (SBE only)**
MANDATORY / OPTIONAL	**Yes for Market Makers**
ASSISTED	**No**

Instructions for SBE: the customer submits a **Quotes** (08) message in a contract where no MM rights are assigned, with all mandatory and conditional MIFID II fields properly populated.

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of a **Quote Ack** (09) message returning with a Bid Error Code / Ask Error Code with the appropriate error code.

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7.17 NEW LP ORDER IN MM CONTRACT EQD IDD CMO

REQUIRED SBE MESSAGES	**New Order (01); Ack (03)**
REQUIRED FIX MESSAGES	**N/A (SBE only)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**Yes**

Instructions for SBE: the customer submits a valid and correctly formatted new BUY order message, with all mandatory and conditional MIFID II fields properly populated with *OrderType* = 2 (Limit), *TimeInForce* set to 3 (IOC) or 4 (FOK), and *Account Type* set to 6 (Liquidity Provider). If required, the Optiq analyst will place an order on the SELL side before the clients submits the BUY order.

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of a **Reject** (07) message if the IOC or FOK order was submitted in an empty book or a **Fill** (04) message if it traded.

7.18 NEW LP IN MM CONTRACT NON-IOC/FOK EQD DD CMO

REQUIRED SBE MESSAGES	**New Order (01); Ack (03)**
REQUIRED FIX MESSAGES	**N/A (SBE only)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Instructions for SBE: the customer submits a valid and correctly formatted new BUY order message, with all mandatory and conditional MIFID II fields properly populated with *OrderType* = 2 (Limit) and *TimeInForce* = 0 (Day), and *Account Type* = 6 (Liquidity Provider).

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of a **Reject** (07) message for the Day order.

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7.19 RFC – REQUEST FOR CROSS EQD IDD CMO

REQUIRED SBE MESSAGES	**New Wholesale Order (64); Wholesale Order Ack (65); Fill (04)**
REQUIRED FIX MESSAGES	**NewWholesaleOrder (U64); WholesaleOrderAck (U65); Execution Report (8)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**Yes**

Note: Controls on Trading Capacities are in place
Combinations of trading capacities for buy / sell legs not allowed in "internal" cross trades:
i) DEAL vs. DEAL, ii) DEAL vs. MTCH, iii) MTCH vs. DEAL, iv) MTCH vs. MTCH

Instructions for SBE: Client initiating the RFC (also referred as the Initiator) submits a valid and correctly formatted Cross Order (SBE: 67) message as a Cross (Order Side = '3')
N.B. RFC orders can only be Limit orders, i.e. Order Type / OrdType (40) should always be set to '2'.

The RFC Validity Period starts.

Optiq Analyst as RFC reactor can submit one-side Cross Order (67) messages to match or improve the price from the Initiator. For submission by the Reactor the Side of the Cross order must be set to either Buy or Sell, i.e. Order Side = '1' (Buy) or '2' (Sell) in SBE;

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of two private Ack (03) messages to confirm the successful receipt and technical processing of the Cross Order

Instructions for FIX: Client initiating the RFC, also referred as the Initiator, then client submits a valid and correctly formatted Cross Order (FIX U67) message as a Cross (Order Side = '3') representing a commitment to cross a given Outright or Strategy for a given Quantity (in the Order Quantity field) at a given Price (in the Order Price field). The NoSides (552) must be set to '2', and repeating group must be provided twice, with buy side first, and sell side second.

Success Criteria for FIX: the customer confirms the receipt and correct interpretation of two private Ack (03) (FIX 8) message to confirm the successful receipt and technical processing of the Cross Order

The RFC Validity Period ends.

Members receive **Fill** (04) (FIX 8) messages for each individual part matched during the execution of their individual orders.

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8. WHOLESALES

8.1 LARGE IN SCALE - CROSS ON AN OUTRIGHT EQD IDD CMO

REQUIRED SBE MESSAGES	**New Wholesale Order (64); Wholesale Order Ack (65); Fill (04)**
REQUIRED FIX MESSAGES	**NewWholesaleOrder (U64); WholesaleOrderAck (U65); Execution Report (8)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Instructions for SBE: the customer submits a valid and correctly formatted **New Wholesale Order** (64) message with *WholesaleSide* = 3 (Cross) and all mandatory and conditional MIFID II fields properly populated. The order must meet the minimum LIS volume threshold and *Wholesale Trade Type* = 0 (LIS Trade)

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of a **Wholesale Order Ack** (65) message followed by two **Fill** (04) messages, all sharing the same value in *LIS Transaction ID*.

Instructions for FIX: the customer submits a valid and correctly formatted **NewWholesaleOrder** (U64) message with *WholesaleSide* (21082) = 3 (Cross) with all mandatory and conditional MIFID II fields properly populated. The order must meet the minimum LIS volume threshold and Wholesale Trade Type = 0 (LIS Trade)
Success Criteria for FIX: the customer confirms the receipt and correct interpretation of a **WholesaleOrderAck** (U65) followed by two **ExecutionReport** (8) message with *ExecType* (150) = F (Filled), all sharing the same value in *LISTransactionID* (21085).

8.2 LARGE IN SCALE - OUTRIGHT EQD IDD CMO

REQUIRED SBE MESSAGES	**New Wholesale Order (64); Wholesale Order Ack (65); Fill (04)**
REQUIRED FIX MESSAGES	**NewWholesaleOrder (U64); WholesaleOrderAck (U65); Execution Report (8)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**Yes**

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Instructions for SBE: the customer submits a valid and correctly formatted **New Wholesale Order** (64) message for one side (buy or sell), with all mandatory and conditional MIFID II fields properly populated. The order must meet the minimum LIS volume threshold and *Wholesale Trade Type* = 0 – LIS Trade. After receiving the **Wholesale Order Ack** (65), the customer provides the *LIS Transaction ID* to the Optiq analyst who will match the Wholesale Order in full.

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of a **Wholesale Order Ack** (65) message followed by a **Fill** (04) message.

Instructions for FIX: the customer submits a valid and correctly formatted **NewWholesaleOrder** (U64) message for one side (buy or sell), with all mandatory and conditional MIFID II fields properly populated. The order must meet the minimum LIS volume threshold and *Wholesale Trade Type* = 0 (LIS Trade). After receiving the **WholesaleOrderAck** (U65), the customer provides the *LIS Transaction ID* (21085) to the Optiq analyst who will match the Wholesale Order in full.

Success Criteria for FIX: the customer confirms the receipt and correct interpretation of a **WholesaleOrderAck** (U65) followed by an **ExecutionReport** (8) message with *ExecType* (150) = F (Filled).

8.3 LARGE IN SCALE - STRATEGY EQD IDD CMO

REQUIRED SBE MESSAGES	**New Wholesale Order (64); Wholesale Order Ack (65); Fill (04)**
REQUIRED FIX MESSAGES	**NewWholesaleOrder (U64); WholesaleOrderAck (U65); Execution Report (8)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Instructions for SBE: the customer submits a valid and correctly formatted **New Wholesale Order** (64) message for a strategy for one side (buy or sell), with all mandatory and conditional MIFID II fields properly populated. The order must meet the minimum LIS volume threshold and *Wholesale Trade Type* = 0 (LIS Trade).

Extra instructions for the recognized strategy:

For a wholesale transaction on an exchange-recognized strategy, the initiator must provide the *Strategy Code*, as well as the overall *Price* and *Quantity*. The overall quantity must be the sum of the legs' quantities and the overall price must be consistent with the legs' price based on the strategy scheme.

The same policy as per strategy creation is applied: strategy codes structure applies from the buy side perspective and the number and sequence of legs' Symbol Indexes as in the strategy must be respected.

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After receiving the **Wholesale Order Ack** (65), the customer provides the *LIS Transaction ID* to the Optiq analyst who will match the Wholesale Order in full.
Success Criteria for SBE: the customer confirms the receipt and correct interpretation of a **Wholesale Order Ack** (65) message followed by a **Fill** (04) message.

Instructions for FIX: the customer submits a valid and correctly formatted **NewWholesaleOrder** (U64) message for a strategy for one side (buy or sell), with all mandatory and conditional MIFID II fields properly populated. The order must meet the minimum LIS volume threshold and *Wholesale Trade Type* = 0 (LIS Trade).

Extra instructions for the recognized strategy:

For a wholesale transaction on an exchange-recognized strategy (formerly strategy package or block), the initiator must provide the *SecuritySubType (762)* the overall *Price (44)* and *OrderQty (38).* The overall quantity must be the sum of the legs' quantities and the overall price must be consistent with the legs' price based on the strategy scheme.
The same policy as per strategy creation is applied: strategy codes structure apply from the buy side perspective and the number and sequence of legs' SymbolIndexes as in the strategy must be respected.

After receiving the **WholesaleOrderAck** (U65), the customer provides the *LIS Transaction ID* to the Optiq analyst who will match the Wholesale Order in full.

Success Criteria for FIX: the customer confirms the receipt and correct interpretation of a **WholesaleOrderAck** (U65) followed by an **ExecutionReport** (8) message with *ExecType* (150) = F (Filled).

8.4 AGAINST ACTUAL EQD IDD CMO

REQUIRED SBE MESSAGES	**New Wholesale Order (64); Wholesale Order Ack (65)**
REQUIRED FIX MESSAGES	**NewWholesaleOrder (U64); WholesaleOrderAck (U65)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Instructions for SBE: the customer submits a valid and correctly formatted **New Wholesale Order** (64) message as a cross with *Wholesale Trade Type* = 1 (Against Actual). The order must meet the minimum LIS volume threshold.

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of a **Wholesale Order Ack** (65) message followed by a **Fill** (04) message.

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Instructions for FIX: the customer submits a valid and correctly formatted **NewWholesaleOrder** (U64) message as a cross with *WholesaleTradeType* (21083) = 1 (Against Actual). The order must meet the minimum LIS volume threshold.
Success Criteria for FIX: the customer confirms the receipt and correct interpretation of a **WholesaleOrderAck** (U65) followed by an **ExecutionReport** (8) message with *ExecType* (150) = F (Filled).

8.5 EXCHANGE FOR SWAPS EQD IDD CMO

REQUIRED SBE MESSAGES	**New Wholesale Order (64); Wholesale Order Ack (65)**
REQUIRED FIX MESSAGES	**NewWholesaleOrder (U64); WholesaleOrderAck (U65)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Instructions for SBE: the customer submits a valid and correctly formatted **New Wholesale Order** (64) message as a cross with *Wholesale Trade Type* = 2 (Exchange for Swaps). The order must meet the minimum LIS volume threshold.

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of a **Wholesale Order Ack** (65) message followed by a **Fill** (04) message.

Instructions for FIX: the customer submits a valid and correctly formatted **NewWholesaleOrder** (U64) message as a cross with *WholesaleTradeType* (21083) = 2 (Exchange for Swaps). The order must meet the minimum LIS volume threshold.

Success Criteria for FIX: the customer confirms the receipt and correct interpretation of a **WholesaleOrderAck** (U65) followed by an **ExecutionReport** (8) message with *ExecType* (150) = F (Filled).

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8.6 WHOLESALE ORDER REJECTION EQD DD CMO

REQUIRED SBE MESSAGES	**New Wholesale Order (64); Wholesale Order Ack (65)**
REQUIRED FIX MESSAGES	**NewWholesaleOrder (U64); WholesaleOrderAck (U65);**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

Note: Controls on Trading Capacities are in place
Combinations of trading capacities for buy / sell legs not allowed in "internal" cross trades:
i) DEAL vs. DEAL, ii) DEAL vs. MTCH, iii) MTCH vs. DEAL, iv) MTCH vs. MTCH

Instructions for SBE: the customer submits a valid and correctly formatted **New Wholesale Order** (64) message with all mandatory and conditional MIFID II fields properly populated and *Wholesale Trade Type* = 0 (LIS Trade). However, the order should not fulfill the minimum LIS volume threshold in order to create a Functional reject

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of a **Wholesale Order Ack** (65) with the appropriate *Error Code* populated.
Instructions for FIX: the customer submits a valid and correctly formatted **NewWholesaleOrder** (U64) message with all mandatory and conditional MIFID II fields properly populated and *Wholesale Trade Type* = 0 (LIS Trade). However, the order should not fulfill the minimum LIS volume threshold in order to create a Functional reject

Success Criteria for FIX: the customer confirms the receipt and correct interpretation of a **WholesaleOrderAck** (U65) with the appropriate *ErrorCode* (9955) populated.

Note: on IDEM market controls on Trading Capacities are in place
Combinations of trading capacities for buy / sell legs not allowed in "internal" cross trades: i) DEAL vs. DEAL, ii) DEAL vs. MTCH, iii) MTCH vs. DEAL, iv) MTCH vs. MTCH

8.7 WHOLESALE ORDER EXPIRATION EQD DD CMO

REQUIRED SBE MESSAGES	**New Wholesale Order (64); Wholesale Order Ack (65); Kill (05)**
REQUIRED FIX MESSAGES	**NewWholesaleOrder (U64); WholesaleOrderAck (U65); ExecutionReport (8)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**No**

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Instructions for SBE: the customer submits a valid and correctly formatted **New Wholesale Order** (64) message with all mandatory and conditional MIFID II fields properly populated and *Wholesale Trade Type* = 0 (LIS Trade). Customer then waits 15 minutes and does not try to match the order.

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of a **Wholesale Order Ack** (65) and after 15 minutes, the **Kill** (05) message with *Kill Reason* = 2 (Order Expired)

Instructions for FIX: the customer submits a valid and correctly formatted **NewWholesaleOrder** (U64) message with all mandatory and conditional MIFID II fields properly populated and *Wholesale Trade Type* = 0 (LIS Trade). Customer then waits 15 minutes and does not try to match the order.

Success Criteria for FIX: the customer confirms the receipt and correct interpretation of a **WholesaleOrderAck** (U65) and after 15 minutes, the **ExecutionReport** (8) confirming the order expiration.

9. TRADE PRICE VALIDATION

9.1 ORDER CANCEL DUE TO TRADE PRICE VALIDATION EQD IDD CMO

REQUIRED SBE MESSAGES	**New Order (01); Kill (05)**
REQUIRED FIX MESSAGES	**NewOrderSingle (D); ExecutionReport (8)**
MANDATORY / OPTIONAL	**Optional**
ASSISTED	**Yes**

Instructions for SBE: the customer submits a valid and correctly formatted new BUY order message, with all mandatory and conditional MIFID II fields properly populated. The price of the order should match the price of a SELL order present in the instrument provided by an Optiq analyst. The matching price will be outside the prevailing collars and therefor the instrument will go into a Reserved state, triggering the Trade Price Validation (TPV) process. After the Matching Engine has tried to reopen the instrument ***n*** amount of times, the order triggering the TPV will be cancelled.

Success Criteria for SBE: the customer confirms the receipt and correct interpretation of an **Ack** (03) message for the BUY order with *Ack Type* = 0 (New Order Ack).
After the Trade Price Validation process has ended with the matching price still being outside the prevailing collars, the order is cancelled and the customer will receive a **Kill** (05) message with *Kill Reason* set to 26 (Order cancelled due to Trade Price Validation).

Instructions for FIX: the Customer submits a valid and correctly formatted BUY new order message, with all mandatory and conditional MIFID II fields properly populated. The price of the order should match the price of a SELL order present in the instrument provided by an Optiq analyst. The matching price will be

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outside the prevailing collars and therefor the instrument will go into a Reserved state, triggering the Trade Price Validation (TPV) process. After the Matching Engine has tried to reopen the instrument ***n*** amount of times, the order triggering the TPV will be cancelled.

Success Criteria for FIX: the customer confirms the receipt and correct interpretation of an **ExecutionReport** (8) message for the BUY order with *ExecType* (150) = 0 (New) and *OrdStatus* (39) = 0 (New)
.
After the Trade Price Validation process has ended with the matching price still being outside the prevailing collars, the order is cancelled and the customer will receive an **ExecutionReport** (8) message with *ExecType* (150) set to w (Order Cancelled due to Trade Price Validation) and *OrdStatus* (39) set to 4 (Cancelled).

10. TRADING CHAIN FAILURES

This test script focuses on disruptive events with limited infrastructure scope that result in a High Availability mechanism of Optiq being triggered. High Availability mechanism is triggered on a scope of partitions or segments.

The complete switch of data centres by the exchange, referred to as Disaster Recovery, is not in scope of these test and will be addressed in a dedicated documentation. A disruptive incident affecting individual partitions or segments will not result in partial switch to the secondary data centre (DR).

10.1 INTRODUCTION

In the event of a disruptive incident resulting in failure of a partition Optiq trading chain application will switch client system processing from being done on the Primary instance (or node) of this partition to its Mirror instance within the same environment. This is a case of a High Availability (HA) event / failover.

High Availability testing is scheduled to take place with customers during the dress rehearsals. Euronext is offering customers the possibility to test High Availability (HA) before these dates in the Next EUA (p-EUA) environment. Euronext strongly recommends the testing of High availability in advance of the dress rehearsals and will facilitate this testing by offering specific opportunities and time slots for the purpose of testing HA conformance scenarios.

In this section:

- Inbound messages refer to messages sent by the client to the OEG
- Outbound messages refer to messages received by the client from OEG

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10.1.1 TESTING OBJECTIVES

The aim of these test is to guarantee no loss of service for clients in case of outage in the primary Trading Chain. More specifically the focus of the test is to ensure that:

- Client detects failure and is able to resume their use of the service and participation in the market.
- Client deals correctly with the "intentional increment sequence number" ([1]) for outbound messages after the reconnection.
- Client deals correctly with the reception of the **Synchronization Time** (51) / (FIX U51) message(s).
- Client detects any duplicate outbound message.
- Client detects any gap in sequence of inbound messages (based on the field "*Last Client Message Sequence Number*" (SBE) / *NextExpectedMsgSeqNum* (tag 789 in FIX protocol) in the Logon response message), and he is able to deal appropriately in accordance of his order entry retransmission policy.
- Client detects the scope of impacted instruments for which some previously received market events (trades/orders) are lost and therefore client must reconcile his order book with the central order book (with respect of those impacted instruments).

10.1.2 TEST PREPARATION

The partition on which the failover will be triggered, and the schedule on which this will be done, will be provided in a dedicated Optiq notice.

The client chooses at their convenience Contracts as follows:

- Scenarios 9.2, 9.3 and 9.5: Contract should be in call trading phase during failover test period
- Scenario 9.4: Contract should be in continuous trading phase during failover test period

The client chooses at their convenience symbol index of individual Instruments that belongs to the target Contract as follows:

- Symbol #A hosted in the failing over partition.
- Symbol #B NOT hosted in the failing over partition. Conditional: relevant for multi-partitions segment HA testing)

Partition on which the Contract, and its instrument, are hosted is provided in the daily standing data file available on EFS for each individual Optiq segment.

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For scenario 9.2, 9.3 and 9.4 client enters only buy orders preferably of type Limit

For scenario 9.5, client is responsible for choosing symbol index where matching is available.

10.2 RECOVERY WITHOUT RETRANSMISSION OF OUTBOUND MESSAGES (HIGHLY RECOMMENDED)

10.2.1 SPECIFIC OBJECTIVE:

Client successfully reconnects to the Mirror
Client manages correctly the "intentional increment sequence number" for inbound messages after the reconnection.
Client manages correctly the reception of the **Synchronization Time** (51) / (FIX U51) message(s)

Client detects the scope of impacted instruments for which some previously received market events (trades/orders/other command messages) are lost and therefore client must reconcile their order book with the central order book (with respect of those impacted instruments).

10.2.2 DETAILED COURSE OF EVENTS:

- Client uses an OE session that connects directly to the failing-over partition.
- Client must have previously connected and received **Instrument Synchronization List** (50) / **InstrumentSynchronizationList** (U50) and recorded all segment instruments along with their related *Resynchronization* ID / *ResynchronizationID*.
- Client enters the following order expected to remain in the book until the failover:
  - One order #1 with "*Cancel On Disconnect*" disabled and one order #2 with "*Cancel On Disconnect*" enabled on symbol #A ○ One order #1bis with "*Cancel On Disconnect*" disabled and one order #2bis with "*Cancel On Disconnect*" enabled on symbol #B (conditional: please see the note in Introduction on relevance of cases to single and multi-partition tests)
- Exchange experiences disruptive incident on the target partition

- **SUCCESS CRITERIA**: client order entry application is able to process successfully the whole recovery sequence as follows.

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1. Detecting Failover for Order Entry Gateways (OEG): • One possible indication is unexpected drop of connection by the OEG (*) • Reception of the **Synchronization Time** (51) / (FIX U51) messages serves as confirmation of the switch to the Mirror instance. (*) Please note – an unexpected drop in connection may be caused by different events
2. Reconnection and recovery On Euronext side, the automatic failover has the following impacts and the customer client connection should be able to process them : • Client reconnects back to the exchange successfully • Client processes correctly the "intentional increment of sequence" as follows: For SBE, the first outbound message received by the client feature an "Intentional increment of sequence number" ([1]). For FIX, a **SequenceReset** (4) is received to perform a GapFill of 1000. • **Synchronization Time** (51) / (FIX U51) messages is received on symbol #A but not for symbol #B, client checks potential stale outbound messages by discarding any previously received outbound message for which *Book In Time* / *BookINTime* (21002) or *Trade Time* / *TransactTime* (60) is higher than *Last In Book time*. There should be any for order #1 • **Kill** (05) / (FIX 8) messages for CoD orders for both #A and B# symbols generated by Cancel On Disconnect mechanism are received
3. The real-time has resumed From now on, the customer should be able to enter new orders normally.

10.3

RECOVERY WITH RETRANSMISSION OF OUTBOUND MESSAGES (HIGHLY RECOMMENDED)

10.3.1 SPECIFIC OBJECTIVE:

Client successfully reconnects to the Mirror

Client detects any gap in sequence of inbound messages (based on the field "*Last Client Message Sequence Number*" (SBE) / *NextExpectedMsgSeqNum* (789 in FIX) in the Logon response message), and he is able to deal appropriately in accordance of his order entry retransmission policy.

Client deals correctly with the reception of the **Synchronization Time** (51) / (FIX U51) message(s).

Client detects any duplicate outbound message.

Client detects the scope of impacted instruments for which some previously received market events (trades/orders) are lost and therefore client must reconcile his order book with the central order book(with respect of those impacted instruments).

10.3.2 DETAILED COURSE OF EVENTS:

- Client use a OE Session that connects directly to the failing-over partition.
- Client must have previously connected and received **Instrument Synchronization List** (50) / **InstrumentSynchronizationList** (U50) and recorded all segment instrument along with their related *Resynchronization* ID / *ResynchronizationID*.
- Client enters the following order expected to remain in the book until the failover :
  - One order #1 with "*Cancel On Disconnect*" disabled and one order #2 with "*Cancel On*

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Disconnect" enabled on symbol #A ○ One order #1bis with "*Cancel On Disconnect*" disabled and one order #2bis with "*Cancel On Disconnect*" enabled on symbol #B (conditional: please see the note in Introduction on relevance of cases to single and multi-partition tests)

- Client must disconnect before the scheduled failover time (the purpose is to force at least one outbound message generated by the exchange but not received by the client before the failure)
- Exchange experiences disruptive incident on the target partition
- Client must re-connect to the partition to process the messages after fail-over

- **SUCCESS CRITERIA**: client order entry application is able to process successfully the whole recovery sequence as follows.

1. Detecting Failover for Order Entry Gateways (OEG): • One possible indication is unexpected drop of connection by the OEG (*) • Reception of the **Synchronization Time** (51) / (FIX U51) messages serves as confirmation of the switch to the Mirror instance. (*)Please note – an unexpected drop in connection may be caused by different events
2. Reconnection and recovery On Euronext side, the automatic failover has the following impacts and the customer client connection should be able to process them : • Client reconnect back to the exchange successfully • Client receives outbound messages associated to the market events that occurred before the incident without any jump in sequence. **Kill** (05) / (FIX 8) messages for CoD orders for both #A and B# symbols generated by Cancel On Disconnect mechanism are received. • Client receives afterward a first outbound message with a jump of sequence equal to the "intentional increment of sequence". In the current scenario, client receives **Synchronization Time** (51) / (FIX U51) messages. • At this stage, thanks to **Synchronization Time** (51) / (FIX U51) messages received, client must have identified symbol #A but not for symbol #B as part of the scope for which reconciliation with central book is required by discarding any previously received message for which *Book In Time* / *BookINTime* (21002) or *Trade Time* / *TransactTime* (60) is higher than *Last In Book time*. There should be any for order #1
3. The real-time has resumed From now on, the customer should be able to enter new orders normally.

10.4 RECOVERY WITH SOME SUPPOSEDLY MISSED INBOUND SEQUENCE NUMBERS (MANDATORY)

10.4.1 SPECIFIC OBJECTIVE:

Client successfully reconnects to the Mirror

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Client detects possible gap in sequence of messages sent to the OEG (based on the field *Last Client Message Sequence Number* / *NextExpectedMsgSeqNum* (789) in the Logon response message), and he is able to deal appropriately in accordance of his order entry retransmission policy.

Client detects the scope of impacted instruments for which some previously received market events (trades/orders) are lost and therefore client must reconcile his order book with the central order book(with respect of those impacted instruments).

10.4.2 DETAILED COURSE OF EVENTS:

- Client use a OE session that connects directly to the failing-over partition.
- Client must have previously connected and received **Instrument Synchronization List** (50) / **InstrumentSynchronizationList** (U50) and recorded all segment instrument along with their related *Resynchronization* ID / *ResynchronizationID*.
- First, client send a high quantity order without "Cancel On Disconnect" #1 at the buy side on symbol #A (if test is being done multi-partition, then non-Cancel on disconnects orders 1#bis should be submitted on symbol #B). Then client sends continuously a sustained rate of very small quantity (minimum lots) CoD orders at the sell side that match totally against order #1 on symbol #A (if test is being done on multi-partition, then orders should be sent against order #1bis on symbol #B) nearly before the fail over scheduled time with the aim to generate a huge number of small trades but also provoke supposedly inbound message loss.
- Exchange experiences disruptive incident on the target partition

- **SUCCESS CRITERIA**: client order entry application is able to process successfully the whole recovery sequence as follows.

1. Detecting Failover for Order Entry Gateways (OEG):

- One possible indication is unexpected drop of connection by the OEG (*)
- Reception of **the Synchronization Time** (51) / (FIX U51) messages serves as confirmation of the switch to the Mirror instance.

(*)Please note – an unexpected drop in connection may be caused by different events

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2. Reconnection and recovery On Euronext side, the automatic failover has the following impacts and the customer client connection should be able to process them : • Client reconnect back to the exchange successfully • Client detect that some inbound messages he has sent before the reconnection are supposedly missed by the exchange (based on the field *Last Client Message Sequence Number*/ **NextExpectedMsgSeqNum** (789) in the Logon response message. At this stage, client should identify the list of those sent messages for symbol #A and #B to prepare further actions depending on his risk management strategy : • Client might receive messages on symbol #A and #B associated to the market events occurred before the incident, including response related to messages supposedly missed by the exchange . • **Synchronization Time** (51) / (FIX U51) messages are received. At this stage: client must have identified symbol #A as part of the scope for which reconciliation with central book is required by discarding any previously received message for which *Book In Time* / *BookINTime* (21002) or *Trade Time* / *TransactTime* (60) is higher than *Last In Book time*. In case of single-partition test, Symbol #B is not in scope of the test, and should not receive Synchronization Time message, and as such not in scope of reconciliation. no orders on symbol #A within the list of supposedly missed messages should remain in pending state: Either not acknowledged before Synchronization Time message (->lost) , or acknowledged before Synchronization Time message (-> discarded or valid based on BookInTime and Last In Book time comparison) In case client wishes to confirm the status of the inbound messages for symbol #B (not in scope of a single-partition tests) sent by the exchange, they can do so by checking their status of such orders via **OpenOrderRequest** (15) / **OrderMassStatusRequest** (AF) or by pulling these orders from the market. **Kill** (05) / (FIX 8) messages for CoD orders for both #A and B# symbols generated by Cancel On Disconnect mechanism are received.
3. The real-time has resumed From now on, the customer should be able to enter new orders normally.

10.5 RECOVERY WITH CROSS ACCESS PARTITION FAILURE (MANDATORY IN THE CASE OF MULTI-PARTITION SEGMENT)

10.5.1 SPECIFIC OBJECTIVE:

- In case the client connection is not involved in cross access trading, client ignore the **Synchronization Time** (51) / (FIX U51) message(s)
- In case the client connection is involved in cross access trading:
  Client deals correctly with the reception of the **Synchronization Time** (51) / (FIX U51) message(s).
  Client detects the scope of instruments for which some previously received market events (trades/orders) are lost and therefore client must reconcile his order book with the central order book in scope.

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10.5.2 DETAILED COURSE OF EVENTS:

- Client use a connection that **DO NOT** connect directly to the failing over partition.
- Client must have previously connected and received **Instrument Synchronization List** (50) / **InstrumentSynchronizationList** (U50) and recorded all segment instrument along with their related *Resynchronization* ID / *ResynchronizationID*.
- If client connection is involved in cross access trading, client enters the following likely on symbol #A to remain in the book until the failover :
  - An order #1 with "Cancel On Disconnect" disabled on symbol #A
  - An order #2 with "Cancel on Disconnect" enabled on symbol #A
- Client sends orders with CoD disabled on the target symbol #B nearly before the fail over scheduled time.
- Exchange experiences disruptive incident on the target partition

- **SUCCESS CRITERIA**: client order entry application is able to process successfully the whole recovery sequence as follows.

1. Detecting Failover for Order Entry Gateways (OEG): • One possible indication is reception of **Reject** (07) / (FIX 8) message from the OEG with status "System Unavailable" from the partition (*) • Reception of the **Synchronization Time** (51) / (FIX U51) messages serves as confirmation of the switch to the Mirror instance. (*) Please note – reception of Reject / FIX 8 with Status "System Unavailable" may be caused by different events
2. Recovery On Euronext side, the automatic failover has the following impacts and the customer client connection should be able to process them : • Client checks that orders sent on symbol #B are acknowledged normally and not impacted by the failover. • Client receives outbound messages on symbol #A associated to the market events that occurred before the incident. • **Synchronization Time** (51) / (FIX U51) messages are received. At this stage: In case the client connection is not involved in cross access trading, client ignore the message In case the client connection is involved in cross access trading, client must have identified symbol #A as part of the scope for which reconciliation with central book is required by discarding any previously received message for which *Book In Time* / *BookINTime* (21002) or *Trade Time* / *TransactTime* (60) is higher than **Last In Book time**. There should be any for order #1 • *Kill* (05) / (FIX 8) messages for Cancel on Disconnect orders generated by CoD mechanism are received
3. The real-time has resumed From now on, the customer should be able to enter new orders normally.

([1]): Intentional Increment of Sequence Number:

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- In some cases when the Primary Partition instance fails over to the Mirror, the message sequence number may be intentionally increments by a pre-defined number. This is being done specifically for cases of disruptive incidents (either HA or Business continuity) to guarantee delivery of full scope of messages for resynchronization and to reduce number of unexpected rejections of client Logon attempts.
- The latest values of this increment are provided in the section "Segment-Wide Configuration Settings" in the *Euronext Markets - Optiq OEG Connectivity Specifications* document.

  For Day 1 of Derivatives on Optiq, this value is set to 1000 for all trading segments.

11. SUPPORT

A Support Desk dedicated to the Optiq programme was launched in June 2016, and will be available to customers for the duration of the Optiq implementation programme. It has been set up to answer customers' queries related to the Optiq programme, to send information to customers related to Optiq, to assist customers in their testing and validation on the EUA environment, and to provide follow-up on client conformance testing.

The Optiq Support Desk has been set up to ensure customer readiness and will be the primary point of contact for clients throughout the migration. The scope of the Support Desk will include:

- Answering customer queries about the Optiq programme, such as technical and functional questions, clarifications on the specifications and documentation, questions relative to the migration and associated dates, and questions regarding connectivity.
- Sending information about Optiq to customers, such as the monthly newsletters, regular technical notes, programme Info Flashes and updates to the dedicated Optiq web page.
- Assisting customers in their testing and validation on EUA environment by generating test orders, trades and market data, matching client orders upon request, and facilitating testing on the platform by creating Production-like conditions.
- Coordination and follow-up on customer conformance testing by ensuring that clients have made the required developments for the new Optiq platform and providing support during the conformance testing periods.

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SUPPORT DESK INFORMATION

Contact details:	Optiq Migration Support Desk Email**:** **optiqmigration@euronext.com**
Opening hours:	Monday – Friday: 09:00 to 18:00 CET

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