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**EURONEXT DERIVATIVES MARKET - UTP TO OPTIQ™ MDG TRANSITION
KINEMATICS SPECIFICATIONS**

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PREFACE

PURPOSE

The Optiq Programme will replace the current Euronext core trading applications (UTP/CCG/XDP) for the Cash (Regulated Market and Warrants) and Derivative markets.

Following customer feedback, the migration to Optiq will start with the Market Data module for Cash and Derivatives. As such, the new Optiq MDG will be connected to the Euronext Cash and Derivatives UTP matching engines in phase 1, and then to the Optiq matching engines for Cash (phase 2) and then Derivatives (phase 3).

This document aims to describe the impacts of phase 1 for the derivatives markets when it comes to Optiq MDG messaging kinematics while linked with UTP-D (Phase 1 & 2)

Optiq MDG will be linked to UTP-D during phase 1 and 2 of the migration, and this document describes the message kinematics between Optiq MDG and UTP-D.

During the transition phases, while Optiq MDG is still connected to the Cash and Derivatives Euronext UTP matching engines, all trading functionalities remain the same and behaviors are not altered. As such, the message sequencing logic for Market Data will still be driven by the Euronext UTP matching engine during the transition phases. It should be noted, however, that this is not necessarily the logic that the full Optiq platform will deliver, once the Cash matching engine migrates onto Optiq in Phase 2, and Derivatives in Phase 3.

SCOPE

Products	
Equities	✗
Funds	✗
Fixed Income	✗
Warrants & Certificates	✗
Futures	✓
Options	✓
Commodities	✓
Indices	✗

WHAT'S NEW?

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

REVISION NO./ VERSION NO.	DATE	CHANGE DESCRIPTION
1.5.1	15/03/2018	Modification on sections 10.2.1 Addition of section 10.2.4

ASSOCIATED DOCUMENTS

The following documents should be read in conjunction with this document:

- Euronext Cash Market - UTP to Optiq MDG Transition Kinematics Specifications v1.4.0
- Euronext Cash and Derivatives Markets - Optiq MDG Client Specifications v1.5.0

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1. OVERVIEW

This document provides an overview of messages exchanged between the Universal Trading Platform (UTP), order entry gateways (CCG's) and the Market Data Gateway (MDG). It includes:

- Typical trading situations and the corresponding public and private messages that are sent during the trading day.
- The names of the messages that are sent.
- The events that trigger the transmission of messages.

1.1 INTRODUCTION

The messages that are sent between trading members and UTP are referred to as private messages, and the messages that are sent between UTP and the market data feed are referred to as public messages.

Private messages are confidential messages sent via order entry gateways to the UTP matching engine, to request information from the system or to issue a command (e.g. enter an order). Private messages are also sent by UTP-D back to the order entry gateways to provide the information requested, or confirm that a command has been successfully executed (or not), as well as to notify trades or market events, etc.

For a complete description of the messages and their fields, please refer to:

- Euronext Derivatives - CCG Client Specification – Binary Interface,
- Euronext Derivatives - CCG Client Specification – FIX 5.0.

Public messages are sent by UTP-D via MDG to provide the market with anonymous trading data, such as orders entered, best limits, executed trades, market events, etc.

The diagrams in this document express representative examples of message sequences and do not provide an exhaustive overview of all possible message transmissions. The detail of the message contents may vary depending on the example.

For a complete description of the public messages and their fields, please refer to:

- Euronext Cash and Derivatives Markets – Optiq MDG Client Specification

1.2 CLIENT MESSAGE INVENTORY BY PROTOCOL

All private message types are available on both FIX 5.0 – SP2 and Binary protocols:

- Application messages: the following messages are only available on the Binary protocol:
 - New Order List (E), Order Revision List (UA), Order Cancel List(UB), Cancel Notification List (UD) and List Status (N)

The following tables show Incoming and Outgoing messages available on FIX 5.0 SP2 and Binary protocols.

APPLICATION MESSAGES			
Incoming Message	Outgoing Message	FIX 5.0 SP2	Binary
New Order Single (D)	Execution Report (8) or For Binary only: Order Ack (a)	✓	✓
Order Cancel Request (F)	Cancel Notification List (UD) (Binary only), Execution Report (8) (FIX 5.0 only) or Order Cancel Reject (9)	✓	✓
Order Mass Cancel Request (q)	Order Mass Cancel Report (r) and Cancel Notification List (UD) (Binary only) or Execution Report (8) (FIX 5.0 only)	✓	✓
Order Revision Request (G)	Execution Report (8), Cancel Notification List (UD) (Binary only) or Order Cancel Reject (9)	✓	✓
Order Mass Status Request (AF)	Execution Report (8)	✓	✓
Security Definition Request (c)	Security Definition Response (d)	✓	✓
New Order Cross (s)	Order Ack (a) (Binary only) and Execution Report (8)	✓	✓
Quote Request (R)	Quote Request Reject (AG) Note: A Market Maker may respond to Quote Request with a Mass Quote (I) message – only available on the UTP binary protocol. No outgoing message in case of a successful Quote Request	✓	✓
None	User Notification (CB)	✓	✓
Either Logon (A) or None	Contract Availability (UC)	✓	✓
Stock Order Routing Request (U9)	Stock Order Routing Response (U0)	✓	✓
New Order List (E)	Order Ack (a), Execution Report (8) or List Status (N)	✗	✓
Order Revision List (UA)	Execution Report (8), Order Cancel Reject (9), Cancel Notification List (UD) or List Status (N)	✗	✓
Order Cancel List (UB)	Cancel Notification List (UD) or Order Cancel Reject (9) or List Status (N)	✗	✓

MARKET MAKER APPLICATION MESSAGES			
Incoming Message	Outgoing Message	FIX 5.0 SP2	Binary
Mass Quote (I)	Mass Quote Acknowledgement (b)	✗	✓
MM Configuration Status Request (U1)	MM Configuration Status Request Ack (U5)	✗	✓
Set MM Protection (U2)	Set MM Protection Ack (U6)	✗	✓
Adjust MM Position (U3)	Adjust MM Position Ack (U7)	✗	✓
Get MM Protection Status (U4)	Get MM Protection Status Ack (U8)	✗	✓

1.3 PRIVATE MESSAGES

Note: Private Messages are not impacted during the transition phase, but are integrated in this document for the sake of clarity.

1.3.1 FIX 5.0 Protocol

FIX 5.0 message IDs are provided throughout the message kinematics section as such:

D →

The list of FIX 5.0 messages is provided below, which includes the list of the names and corresponding codes of each FIX 5.0 private message.

If the 'None' value appears as an incoming message, it means that the outgoing message comes from a unsolicited publication (typically at the start of the day).

FIX 5.0 APPLICATION MESSAGES			
Incoming Messages		Outgoing Messages	
Code	Description	Code	Description
D	New Order Single	8	Execution Report
F	Order Cancel Request	8	Execution Report
		9	Order Cancel Reject
q	Order Mass Cancel Request	8	Execution Report
		r	Order Mass Cancel Report
G	Order Revision Request	8	Execution Report
		9	Order Cancel Reject
AF	Order Mass Status Request	8	Execution Report
c	Security Definition Request	d	Security Definition Response
s	New Order Cross	8	Execution Report
R	Quote Request	AG	Quote Request Reject
None	None	CB	User Notification
A or None	Either Logon (A) or None	UC	Contract Availability
U9	Stock Order Routing Request	U0	Stock Order Routing Response

1.3.2 Binary Protocol

Throughout this document, Binary message IDs are provided in brackets as such:

(D)

The list of Binary messages is as follows:

BINARY APPLICATION MESSAGES			
Incoming Messages		Outgoing Messages	
Code	Description	Code	Description
D	New Order Single	a	Order Ack
F	Order Cancel Request	UD	Cancel Notification List
		9	Order Cancel Reject

BINARY APPLICATION MESSAGES			
Incoming Messages		Outgoing Messages	
Code	Description	Code	Description
q	Order Mass Cancel Request	UD	Cancel Notification List
		r	Order Mass Cancel Report
G	Order Revision Request	UD	Cancel Notification List
		9	Order Cancel Reject
AF	Order Mass Status Request	8	Execution Report
c	Security Definition Request	d	Security Definition Response
s	New Order Cross	a	Order Ack
		8	Execution Report
R	Quote Request	AG	Quote Request Reject Note (Note: A Market Maker may respond to Quote Request with a Mass Quote (I) message – only available on the UTP binary protocol) (Note: No outgoing message in case of a successful Quote Request)
None	None	CB	User Notification
A or None	Either Logon (A) or None	UC	Contract Availability
U9	Stock Order Routing Request	U0	Stock Order Routing Response
E	New Order List	a	Order Ack
		8	Execution Report
		N	List Status
UA	Order Revision List	8	Execution Report
		9	Order Cancel Reject
		UD	Cancel Notification List
		N	List Status
UB	Order Cancel List	UD	Cancel Notification List
		9	Order Cancel Reject
		N	List Status

BINARY MARKET MAKER APPLICATION MESSAGES			
Incoming Messages		Outgoing Messages	
Code	Description	Code	Description
I	Mass Quote	b	Mass Quote Acknowledgement
U1	MM Configuration Status Request	U5	MM Configuration Status Request Ack
U2	Set MM Protection	U6	Set MM Protection Ack
U3	Adjust MM Position	U7	Adjust MM Position Ack
U4	Get MM Protection Status	U8	Get MM Protection Status Ack

1.4 OPTIQ MDG PUBLIC MESSAGES

MDG message identifiers are provided throughout the message kinematics section as shown below, in this example for a Market Update:

Market Update →

The list of public messages used for derivatives markets is as follows:

Description
Start Of Day (1103)
End Of Day (1102)
HealthStatus (1103)
Trade Retransmission Start (1104)
Trade retransmission End (1105)
Contract Standing Data (1013)
Outright Standing Data (1014)
Strategy Standing Data (1012)
Market Update (1002)
Market Status Change (1005)
Price Update (1003)
Statistics (1009)
Exchange Announcement (1010)

Under certain conditions (e.g. a limit order price becoming the best limit), an additional Optiq MDG message is generated as shown below:

If this new price is the best, an additional message is generated:

(Market Update) →

UpdateType: 1 (Best Bid) or 2 (Best Offer)

Note: For the sake of clarity, details concerning public market data will be *italicized* in the text, in order to differentiate private messages, which are not impacted during the transition, as previously mentioned.

1.5 MDG MESSAGES MAPPING WITH LEGACY XDP MESSAGES

A mapping of MDG messages with the former XDP protocol is provided hereafter:

UTP MESSAGES		OPTIQ™ MESSAGES	
XDP Code	Description	Binary Code	Description
702	Market Update	1001	Market Update
		1004	Full Trade Information
		1003	Price Update
712	Settlement Price		
741	Product Availability	1005	Market Status Change
752	Market Status		
722	Outright Standing Data	1014	Outright Standing Data
		1013	Contract Standing Data
732	Strategy Standing Data	1012	Strategy Standing Data
		1013	Contract Standing Data
772	Value-Added parameters	1009	Statistics
761	Exchange Message	1010	Exchange Announcement

Open Interest will no longer be delivered through an independent Market Data messages. The data will be provided alongside reference data both on the feed and in the dedicated file.

1.6 NEW FEATURES FOR MARKET LIMITS

In the legacy XDP protocol, limits are communicated through a XDP-D 702 Market Update message as follows:

- The book limits are disseminated for each impacting market event (New Order, Order Cancellation, etc.), with an update type set at 'Bid' or 'Offer'
- If the BBO is impacted, a second message is sent accordingly, with an update type set at 'Best Bid', 'Best Offer'

In Optiq MDG, the MDG Market Update message specifies if the update comes from newly entered limits in the book, with an update type set at 'New Bid' or 'New Offer' or if it comes from an update on an already existing limit, following order entry requests: 'Updated Bid', 'Updated Offer'. In the following kinematics, this update type is described as follows:

- If the event generates new limits :

Market Update →
UpdateType: 3 (New Bid), 4 (New Offer)

- If the market event triggers an update of existing limits:

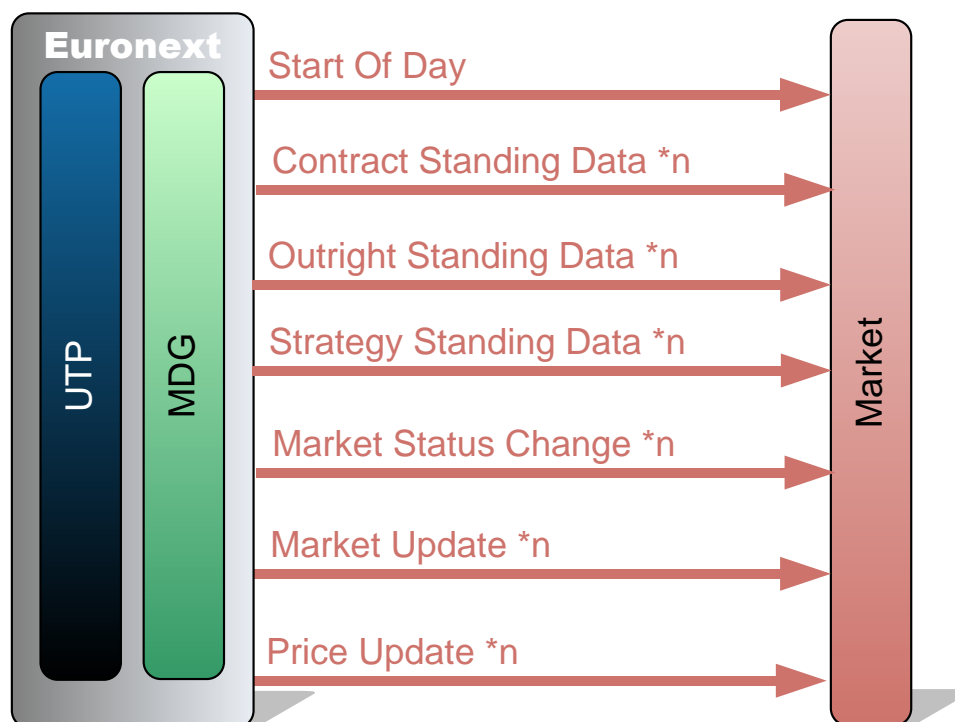
Market Update →
UpdateType: 5 (Updated Bid) or
6 (Updated Offer)

- If the event triggers updates of both an existing limit and the BBO, two updates are provided, first on the limit as described, and the second providing the best limit impacted.

The Best Bid and Best Offer should always be processed *together* to build the market sheet.

2. COMMON KINEMATICS

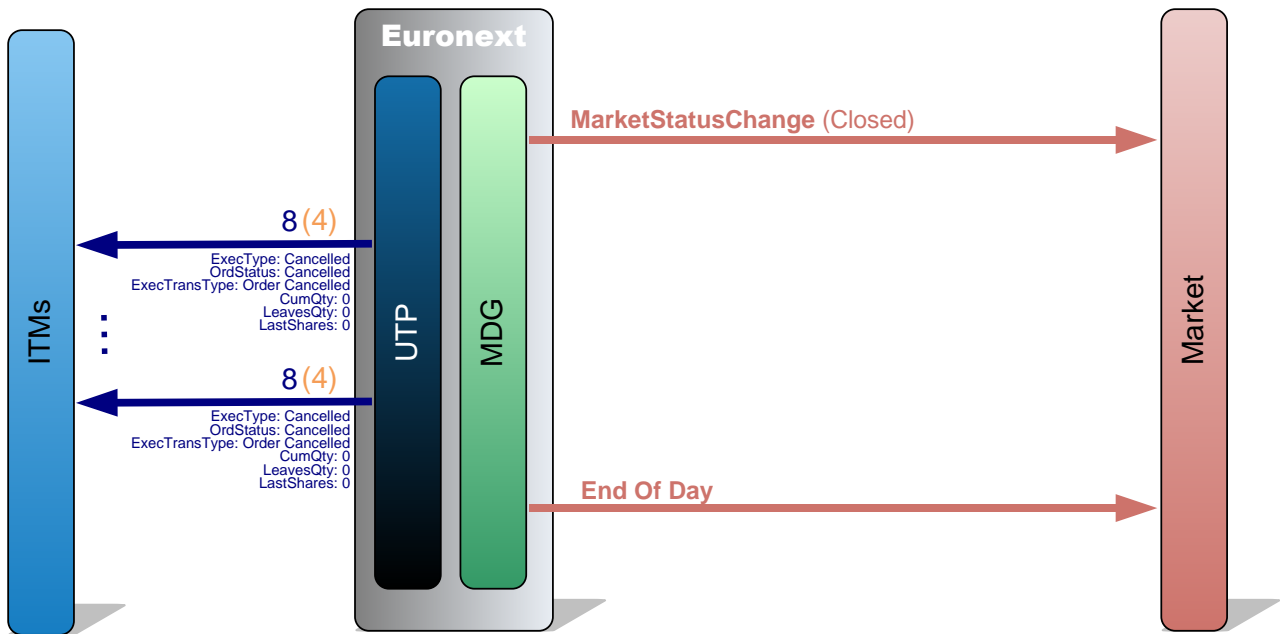
2.1 Messages generated at start of day



At the Start of the Day, UTP-D disseminates the following messages to the Market:

- Start Of Day Message
- MDG Standing Data (Referential Data) for each outright instrument
- MDG Strategy Standing Data (Referential Data) for each Strategy instrument
- MDG Market Status Change (Market Status: Order entry and phase changes) for each contract
- MDG Market Update for each instrument's order book
- MDG Price Update (previous day's daily settlement price) for each outright instrument

2.2 Messages generated at end of day



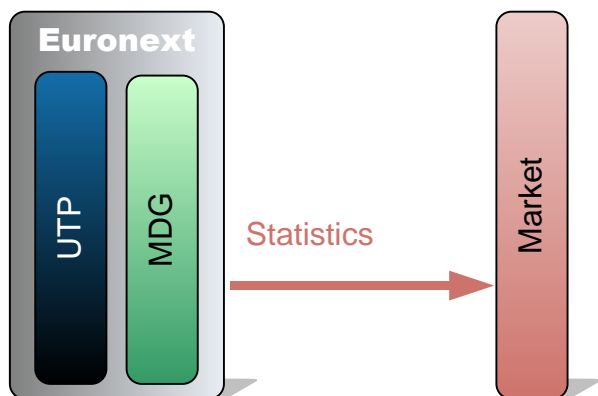
Expired orders are cancelled at the end of the trading day, and a private **8 (4)** message will be sent for each expired order.

The public **1102 (EndOfDay)** message is always the last message sent, and it notifies that the platform and its network are now closed.

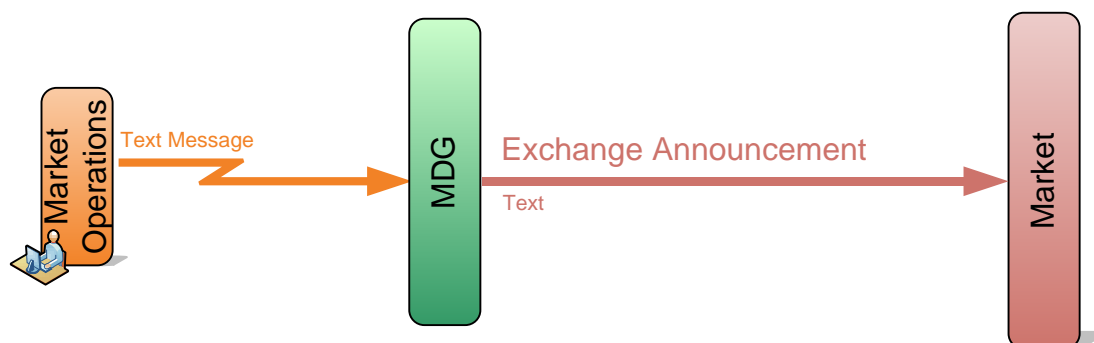
2.3 Statistics

On the XDP-D Protocol, the 772 message provided the value added parameters was included within the trading kinematics.

In Optiq MDG, this data will be disseminated through a Statistics message independent from the core trading kinematics: it will not be published systematically after each trade as a rule, only if a statistic has changed.



2.4 Exchange Announcement

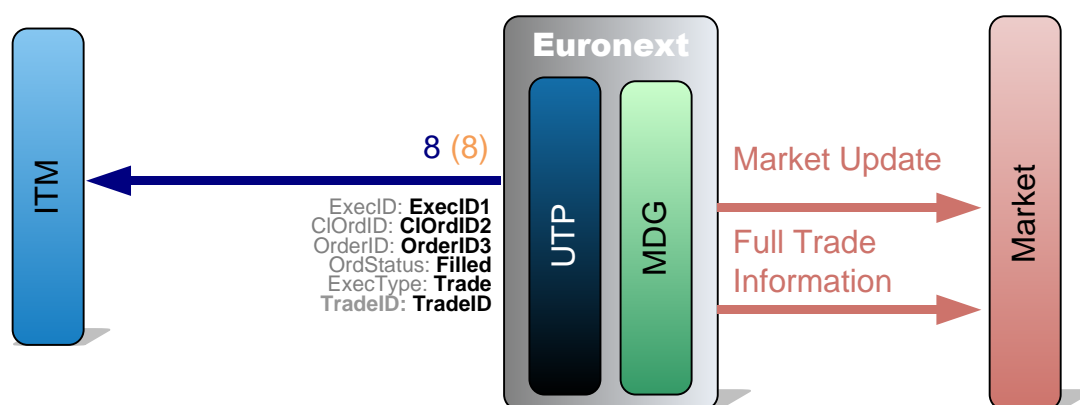


The public news and announcements message **1010 (ExchangeAnnouncement)** is a message sent to inform markets participants about trading information like technical problems, regulatory decisions, etc. The messages can be sent at any time during the day.

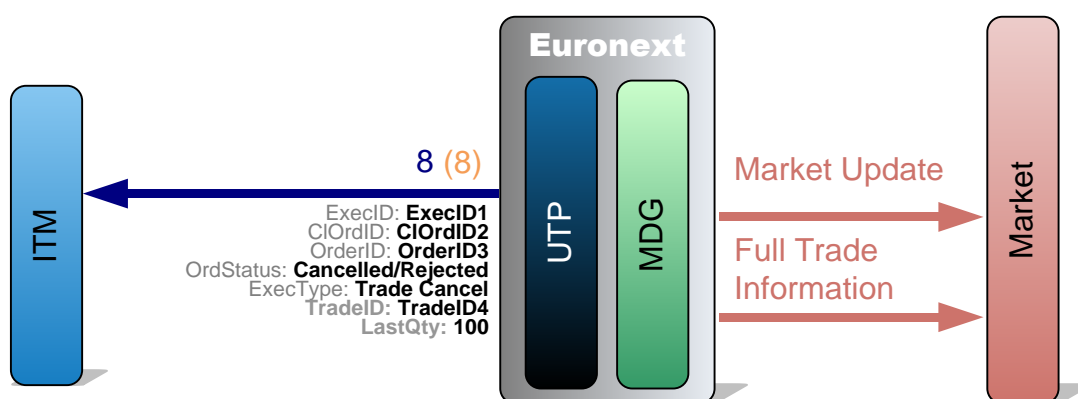
2.5 TRADE EXECUTION / CANCELLATION NOTIFICATION

Section 7 of this document is dedicated to trade kinematics. As a general principle, all trading kinematics are disseminated through MDG Market Update message (Limits & Trades).

The **Market Update** message only provides a short trade summary (i.e. trade type, price and quantity) on a specified instrument. As a MiFID II requirement, the **full trade summary** is disseminated in parallel on the dedicated post-trade channel, supported by a specific message: **Optiq MDG Full Trade Information**.



In the event of a trade cancellation, both Market Update and Full Trade Information are also sent (Market Update Type = Trade Type: Trade Cancellation)

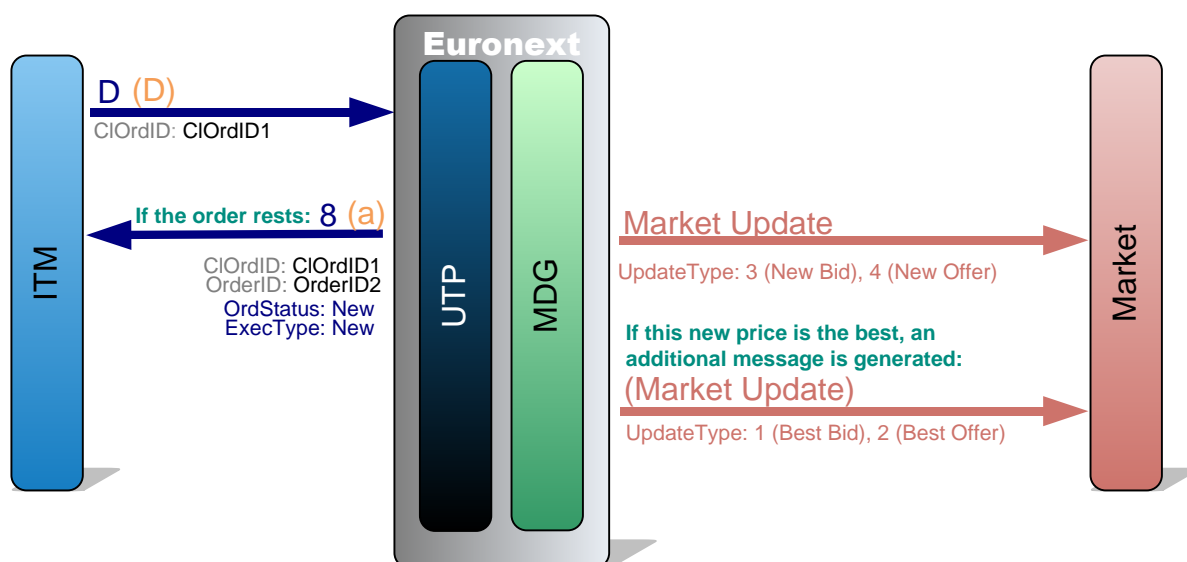


For clarity, the dissemination of the Full Trade Information is not indicated.. The reader should therefore keep in mind that each time a Market Update is sent to indicate a trade, a Full Trade Information message is also sent in the dedicated channel.

3. ENTERING ORDER(S)

3.1 NEW ORDER SINGLE

3.1.1 New Single Order Entry Accepted



In FIX 5.0, if the new order is accepted and is kept in the order book then an **Execution Report (8)** with the OrdStatus = New and ExecType = New is sent.

In the Binary protocol, if an order is accepted and remains in the order book then the Exchange responds with an **Order Ack (a)**.

The ClOrdID contains the Client's identifier for the order.

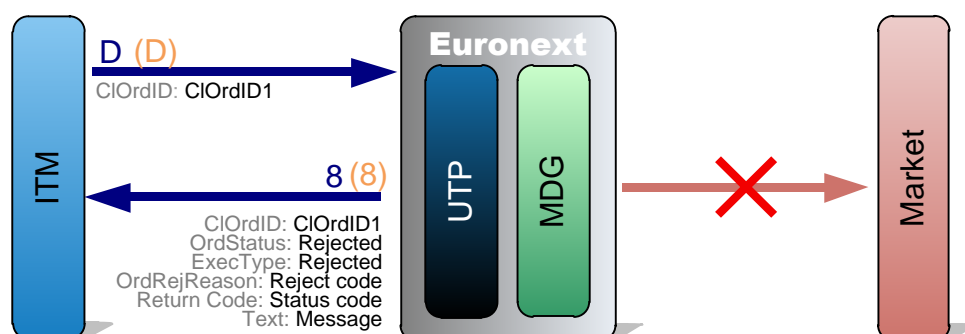
The acknowledgement includes the OrderID allocated by the Exchange.

The OrderID or the ClOrdID must be used on subsequent requests regarding the order.

The Exchange sends a public Optiq MDG Market Update message to the Market, with a Market Data Update Type set accordingly for the new/updated limit received.

If the price is the best limit upon entry into the book, then another Market Update message is generated.

3.1.2 New Single Order Rejected



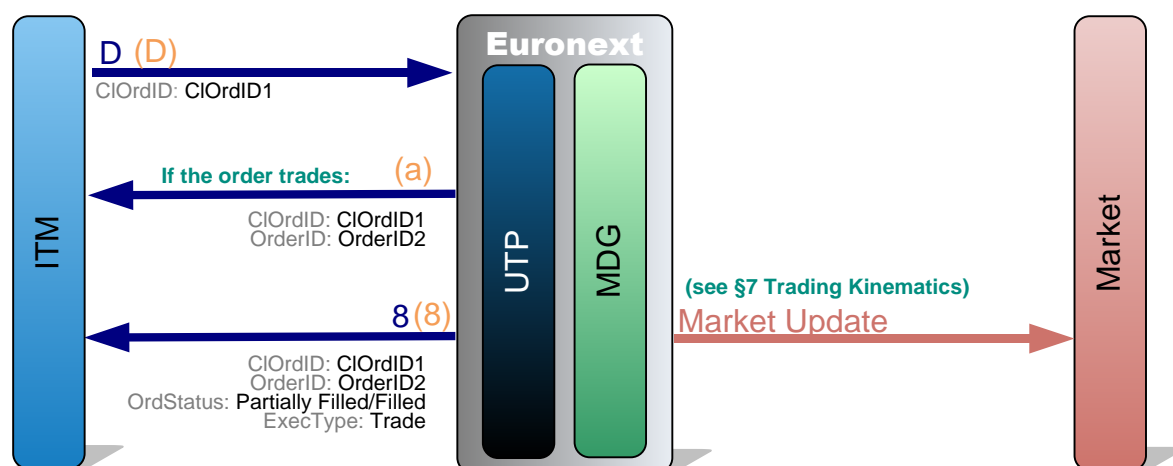
If the new order is rejected, then an **Execution Report (8)** with OrdStatus = Rejected and ExecType = Rejected is sent.

The OrdRejReason specifies the rejection reason, and if the OrdRejReason is set to 'Other' (the default value), then the status code is given in the ReturnCode field.

An explanation is also provided in the Text field.

No MDG Market Update message is sent to the Market in the event of a new order rejection.

3.1.3 Order Matching



In FIX 5.0, if a new order is accepted and trades, then an **Execution Report (8)** with the OrdStatus = Partially Filled/Filled and ExecType = Trade is sent.

In the Binary protocol, if the new order is accepted and trades, then **both** an **Order Ack (a)** and an **Execution Report (8)** with the OrdStatus = Partially Filled/Filled and ExecType = Trade is sent.

At least one Market Update message is sent to market participants according to the matching scenario (please refer to section 7, Trading Kinematics).

The CIOrdID contains the Client's identifier for the order.

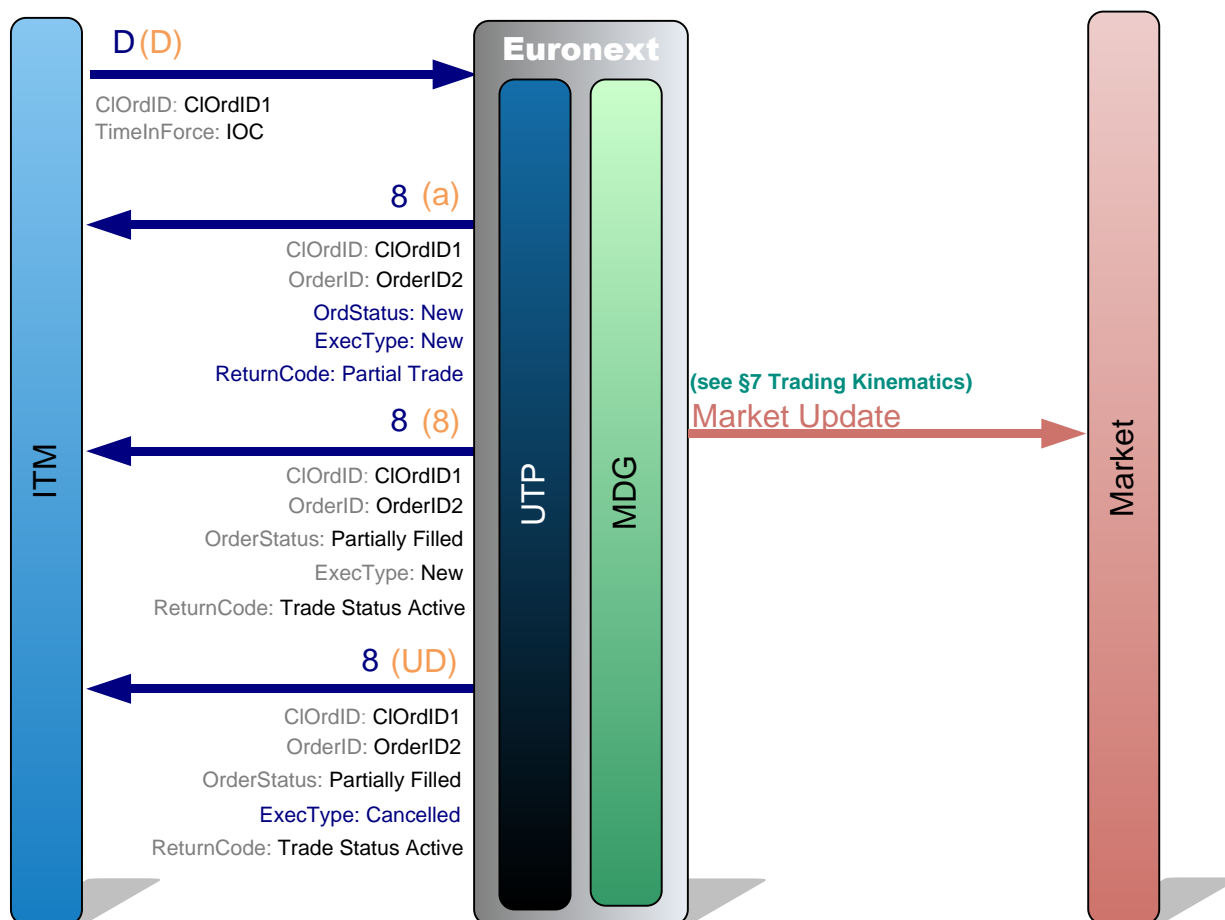
The Execution Report includes the OrderID allocated by the Exchange.

The OrderID or the CIOrdID must be used on subsequent requests regarding the order.

3.1.4 IOC Partially Filled

Immediate or Cancel (IOC) orders are executed against any existing orders at the stated price or better, up to the volume of the IOC order. Any residual volume from the IOC order is cancelled.

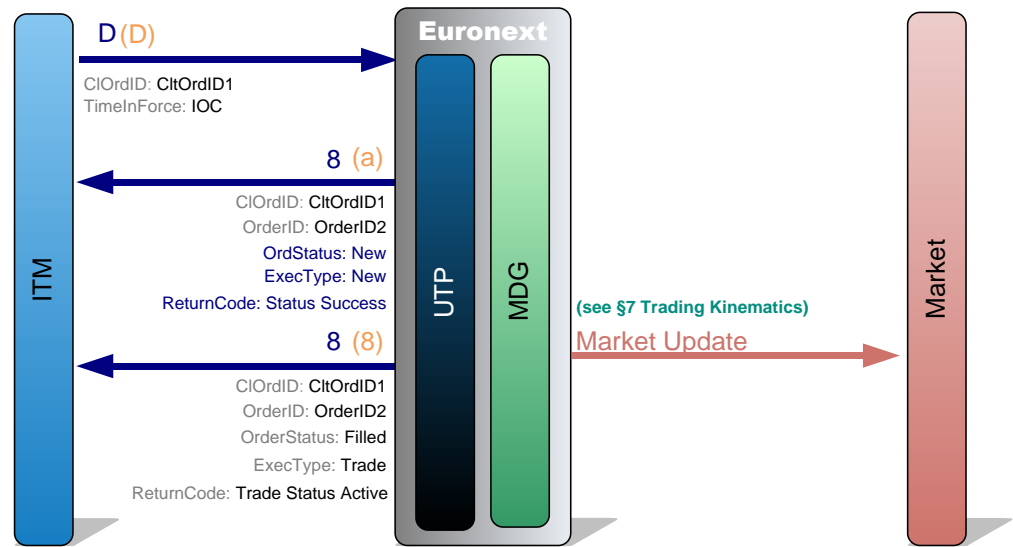
If an IOC order is partially filled then the following messages are returned:



Optiq MDG messages are generated accordingly to the specific trading scenario (see paragraph §7 Trading Kinematics)

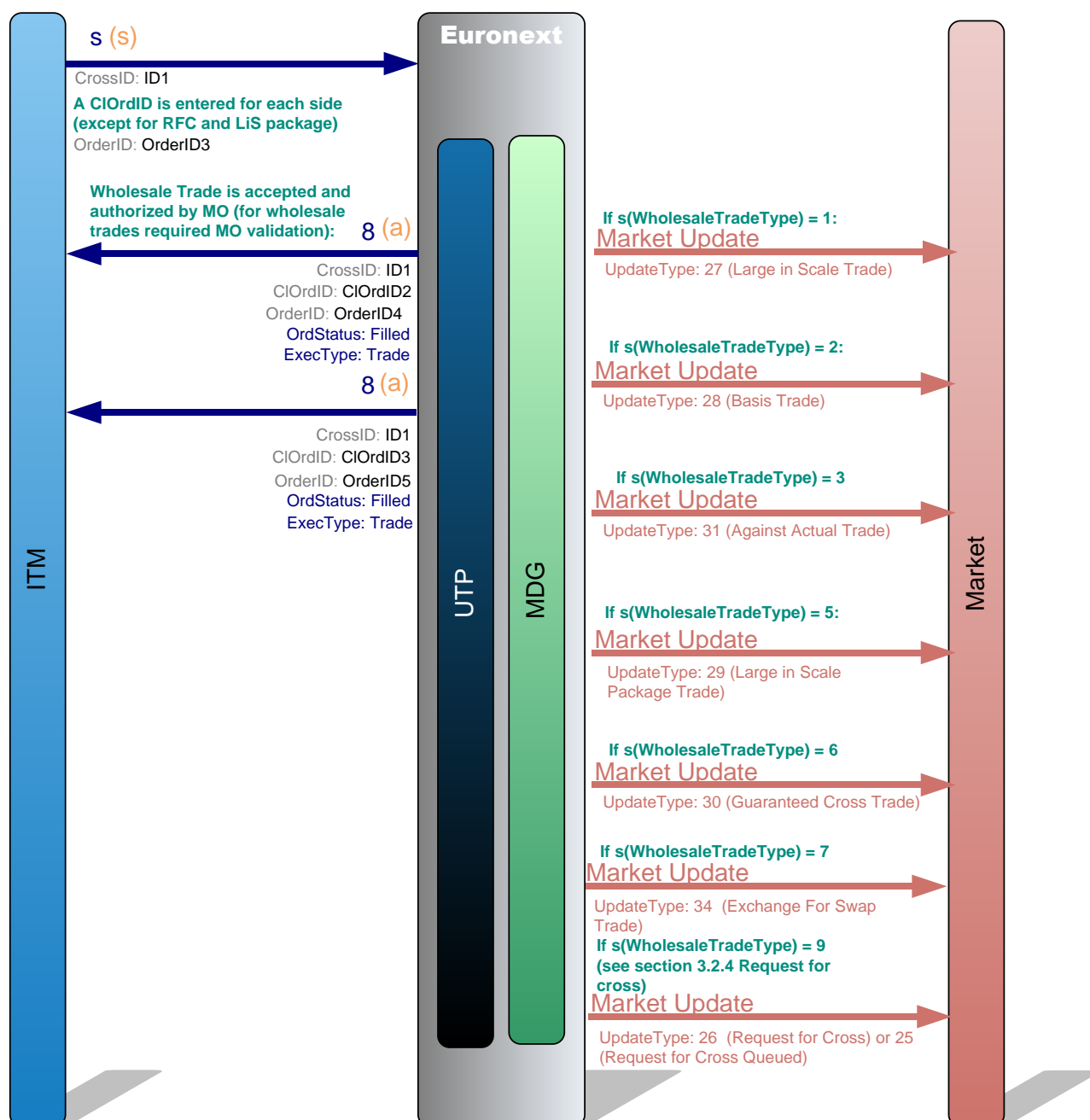
3.1.5 IOC Fully Filled

If an IOC order is fully matched then the following messages are returned:



3.2 NEW ORDER CROSS

3.2.1 New Order Cross Accepted and Authorized by Market Operations



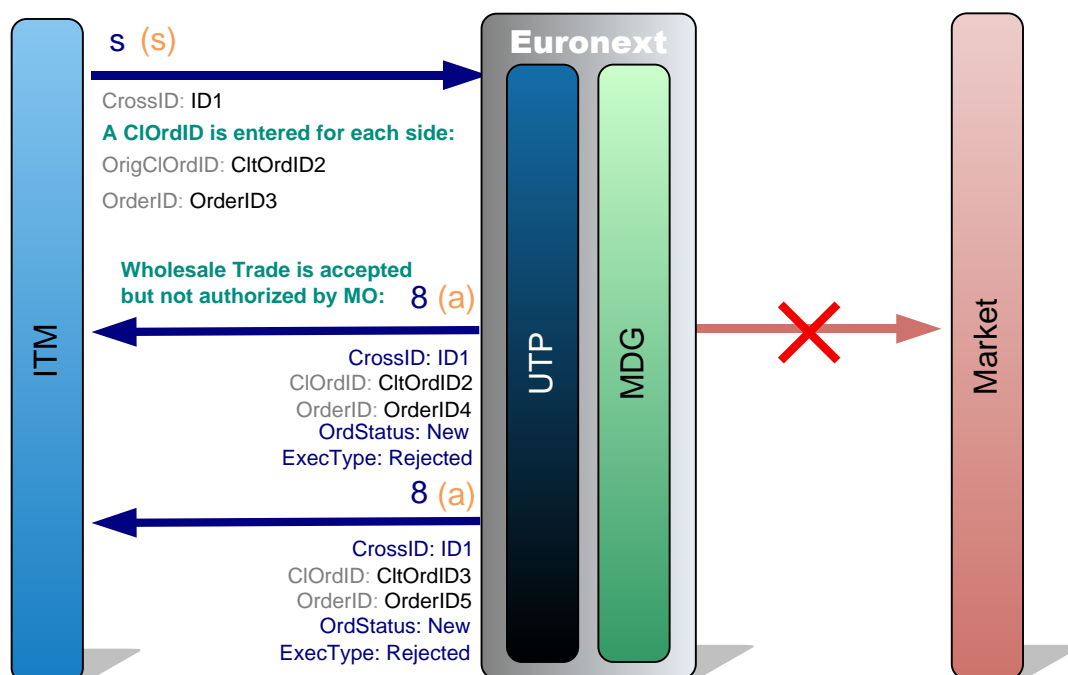
When the New Order Cross is accepted (for all wholesale types) and authorized (for wholesale trades requiring Market Operations validation, i.e. Basis, Against Actual, Guaranteed Cross and Exchange For Swap), an **Execution Report (8)** is sent out for each side with OrdStatus = Filled and Exec Type = Trade.

If a New Order Cross type is not subject to exchange authorisation and trades immediately upon submission, then the Order Ack and Execution Report will be sent simultaneously.

According to the wholesale trade type, a Market Update message is sent to market participants with a Market Data Update Type indicating the appropriate Trade Type.

For Request for Cross features, please refer to the dedicated section 3.2.4: Request for Cross.

3.2.2 New Order Cross not Authorized by Market Operations



In FIX 5.0, if a New Order Cross is accepted but is not authorised then the Exchange responds with an **Execution Report (8)** with the following values for each side: OrdStatus = New and ExecType = Rejected.

In the Binary protocol, if a New Order Cross is accepted and is not authorised then the Exchange responds with an **Order Ack (a)** for each side, with an ExecType 8 – Rejected and a return code : Order pulled by Market Control.

The Cross ID contains the client's New Order Cross request identifier.

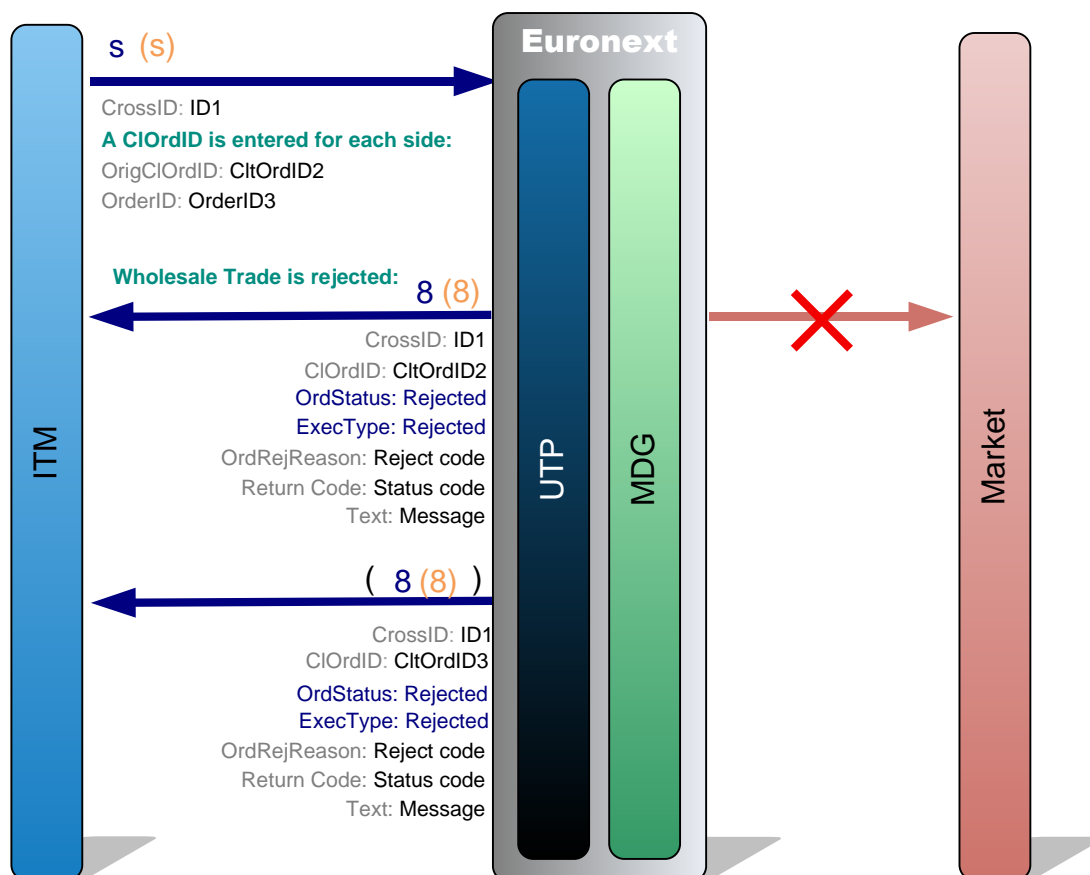
Each side of the Cross Order has a mandatory ClOrdID that contains the Client's own reference ID.

The Order Ack includes the OrderID allocated by the Exchange.

The OrderID or the ClOrdID may be used on subsequent requests regarding the order for LIS Packages and RFCs.

No message MDG Market Update is sent to the Market.

3.2.3 New Order Cross Rejected



If the New Order Cross is rejected then the Exchange responds with an **Execution Report (8)** with each side sent as OrdStatus = Rejected and ExecType = Rejected.

The New Order Cross may be rejected for the following reasons:

- failed the Matching Engine validation
- subject to Market Operations authorisation and subsequently rejected.

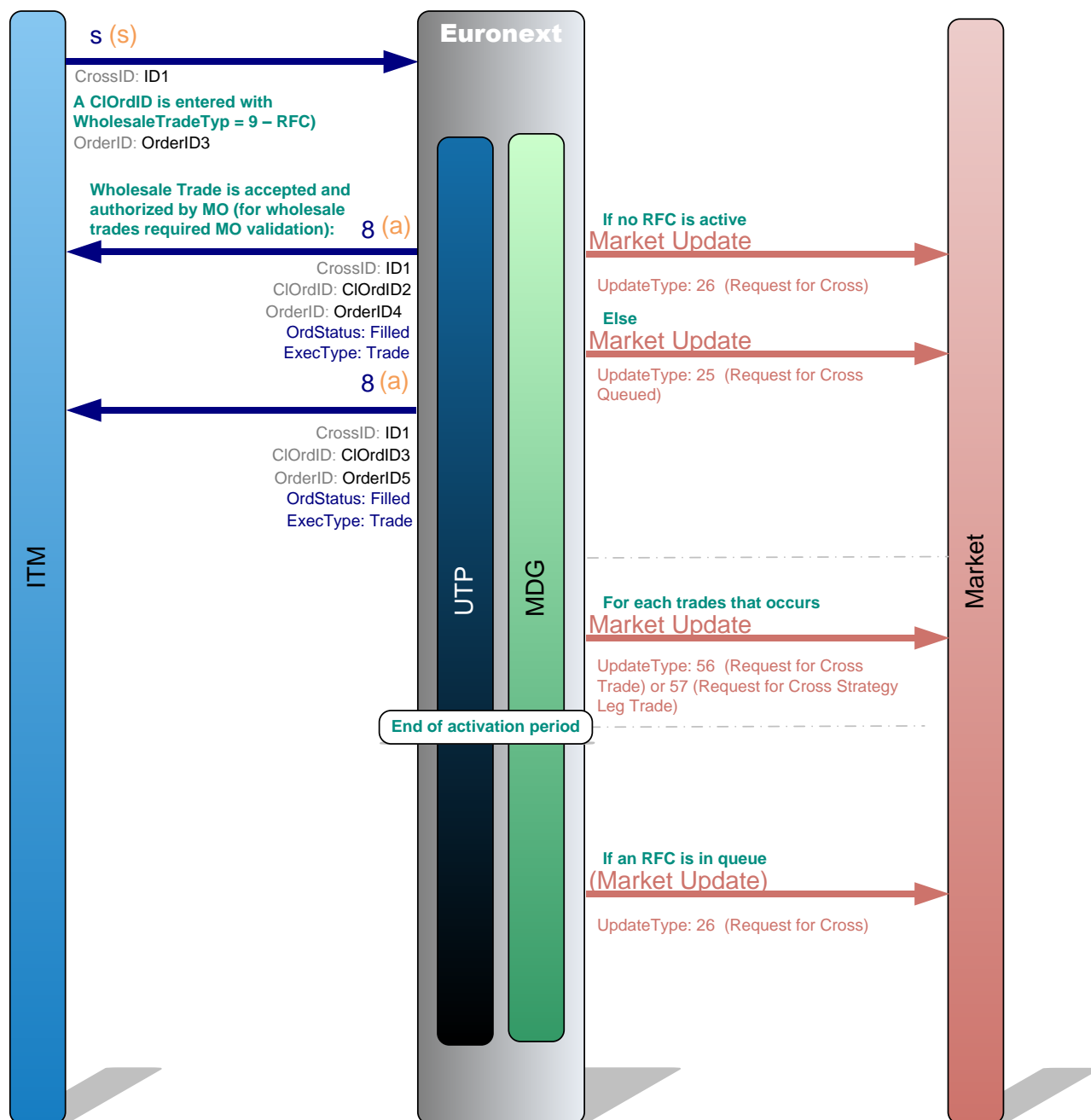
The OrdRejReason contains a code for the rejection reason. If the OrdRejReason is set to 'Other', then the status code is given in the ReturnCode.

According to Order type, the rejection might not be sent on both sides (RFC, LiS Package).

The Exchange provides an additional explanation in the text field.

No MDG Market Update message is sent to the Market.

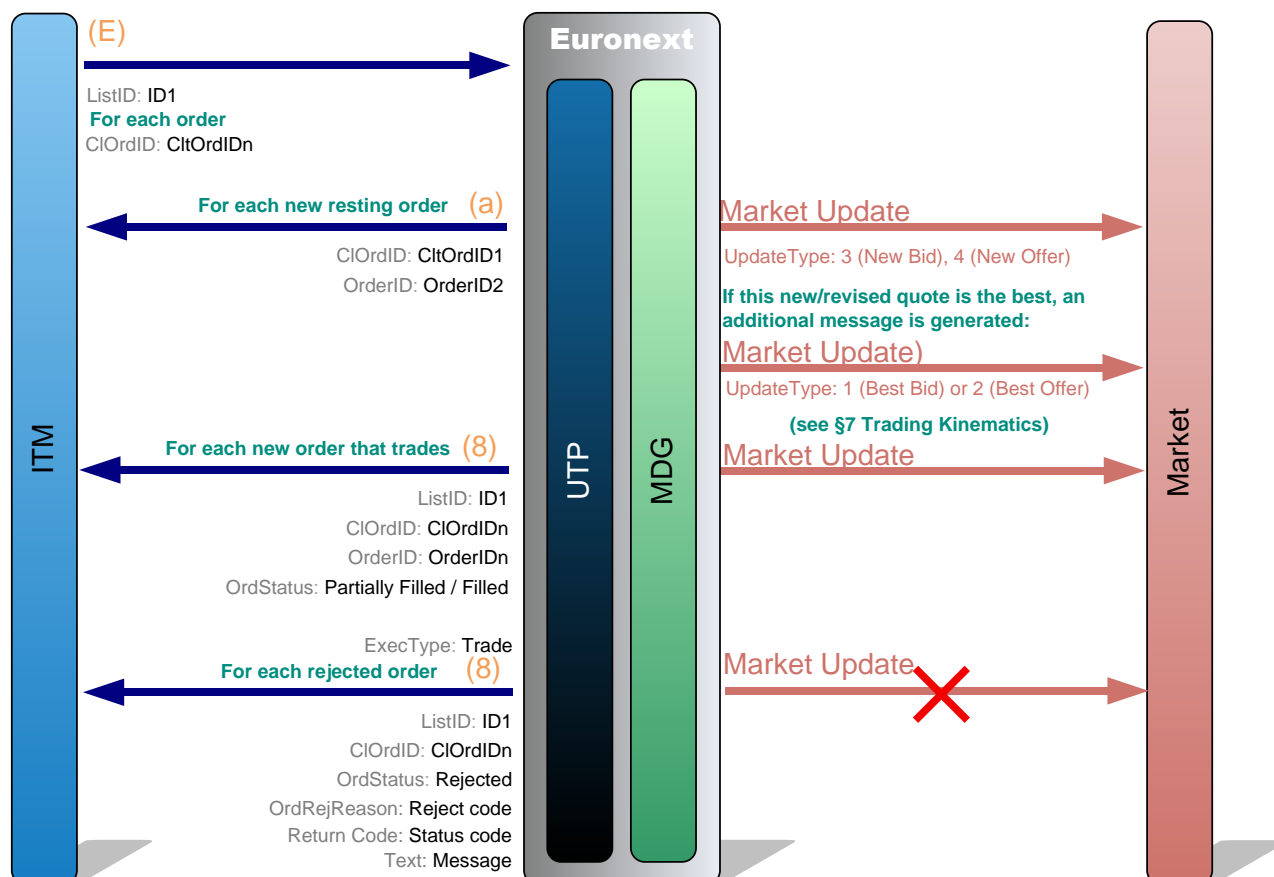
3.2.4 Request for Cross



Once an RFC is submitted and accepted (see section 3.2.1), a first Market Update message is sent to the market to notify either the activation of an RFC, or to notify that it is queued due to the presence of an another active one RFC. While it is active, all trades that take place are tagged as Request For Cross Trades. Once this time period ends, if the queue contains another RFC, the market is notified of the activation of the next RFC.

3.3 NEW ORDER LIST (BINARY ONLY)

3.3.1 New Order List Accepted



If an order in the list is accepted and immediately trades, then an **Order Ack (a)** and an **Execution Report (8)** for each new order which has OrdStatus = Partially Filled/Filled and the ExecType = Trade is sent.

The ListID contains the unique client identifier for the request.

For each new order:

- The ClOrdID contains the client identifier for the order.
- The Execution Report includes the OrderID allocated by the Exchange.
- The OrderID or ClOrdID must be used on subsequent requests regarding the new order.

For each resting order:

If an order in the list is accepted but is kept in the order book without trading, then an Order Ack (a) is sent.

An Optiq Market Update message is sent to the Market, referring to the resting order, with its Market Update Type set accordingly.

If this remaining order creates the best price level in the market, then another Optiq MDG message is generated, with UpdateType = '1' for a best bid order or UpdateType = '2' for a best offer order.

For each order that trades:

Message type 8 is sent, and a public Optiq MDG message is sent to notify the market of the trade (please refer to paragraph Trade Notification).

For each order that was rejected within the list:

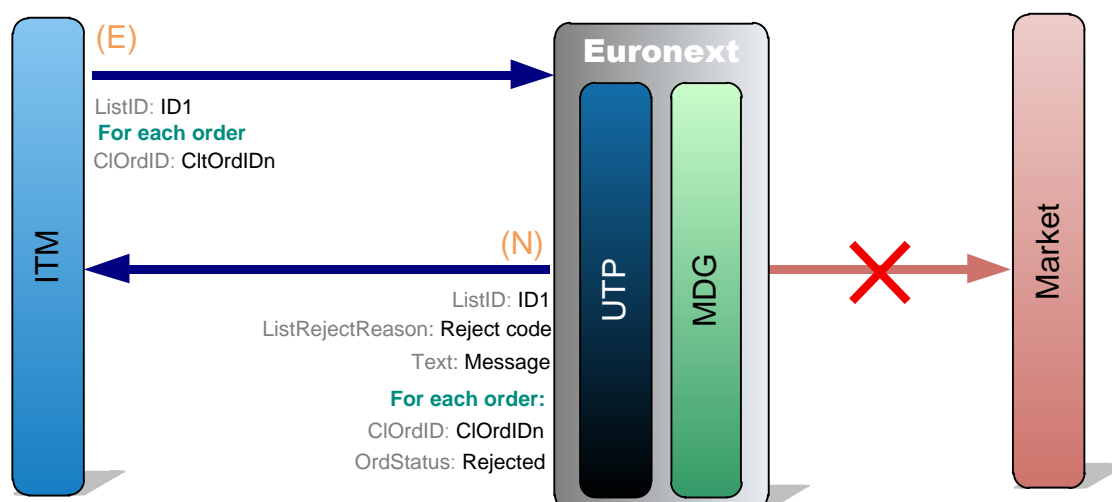
The Exchange also responds with an **Execution Report (8)** message:

The OrdRejReason contains a code for the rejection reason. If the OrdRejReason is set to 'Other', then the status code is given in the ReturnCode.

When necessary, an explanation will also be provided in the Text field.

No MDG Market Update message is sent to the Market.

3.3.2 New Order List Rejected



If all the orders in the list are rejected then the Exchange responds with a **ListStatus (N)** message.

The ListRejectReason contains a code for the rejection reason.

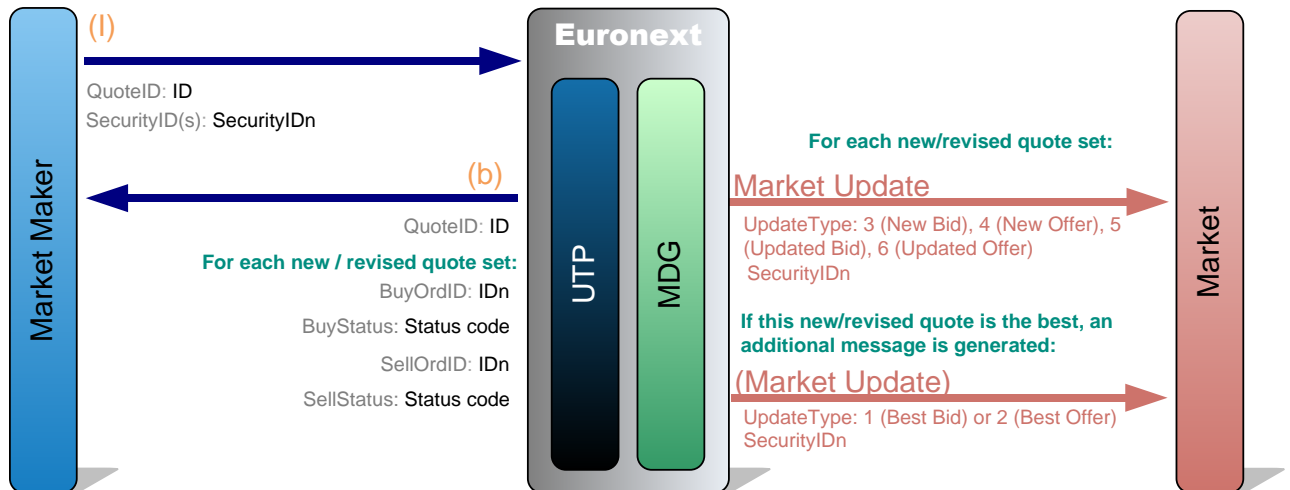
When necessary, an explanation will also be provided in the Text field.

For each new order that was requested, this message contains the ClOrdID and the OrdStatus = Rejected.

No MDG Market Update message is sent to the Market.

3.4 MASS QUOTE (BINARY ONLY)

3.4.1 Mass Quote Accepted/Revised



The Exchange responds to a **Mass Quote (I)** with a **Mass Quote Acknowledgement (b)**.

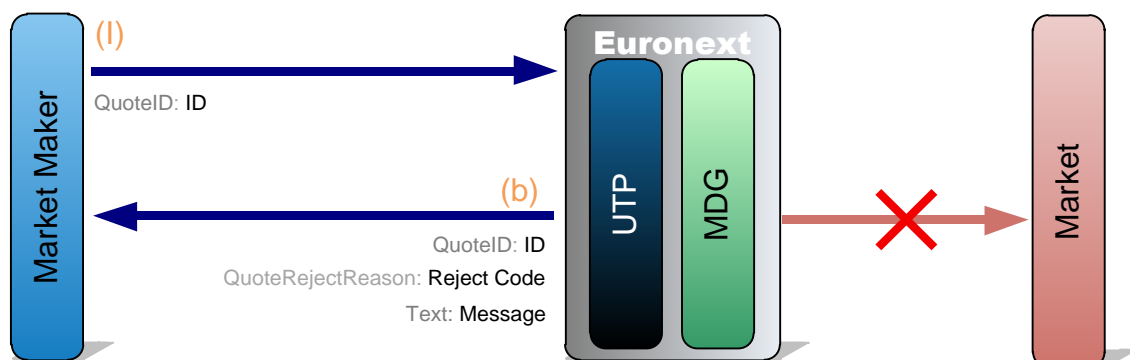
The mass quote is identified by a QuotelD.

The BuyStatus and SellStatus report the success or failure of each resulting quote or quote revision. The repeating quote sets are in the same order as the quote sets on the **Mass Cancel (I)**.

For each quote sent on an instrument, the following messages will be sent:

- First Market Update with an Update Type set accordingly
- Second Market Update with Update Type = '1' (Best Bid) or '2' (Best Offer) (only if BBO is impacted)

3.4.2 Mass Quote Rejected



If the entire **Mass Quote (I)** message is rejected then the Exchange responds with a **Mass Quote Acknowledgement (b)**.

The QuoteRejectReason contains a code for the rejection reason.

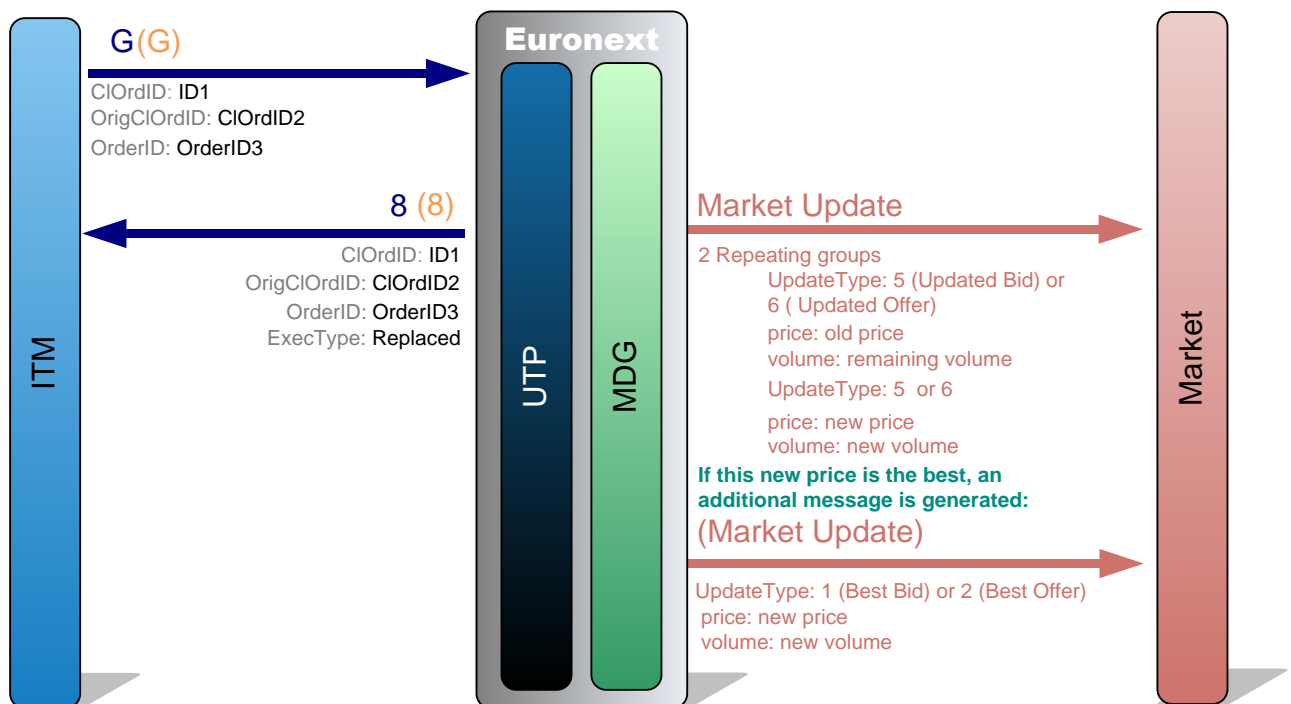
When necessary, an explanation will also be provided in the Text field.

No MDG Market Update public message is sent.

4. REVISING ORDER(S)

4.1 ORDER REVISION REQUEST

4.1.1 Order Revision Request Accepted (Modifying an Unmatched Order)

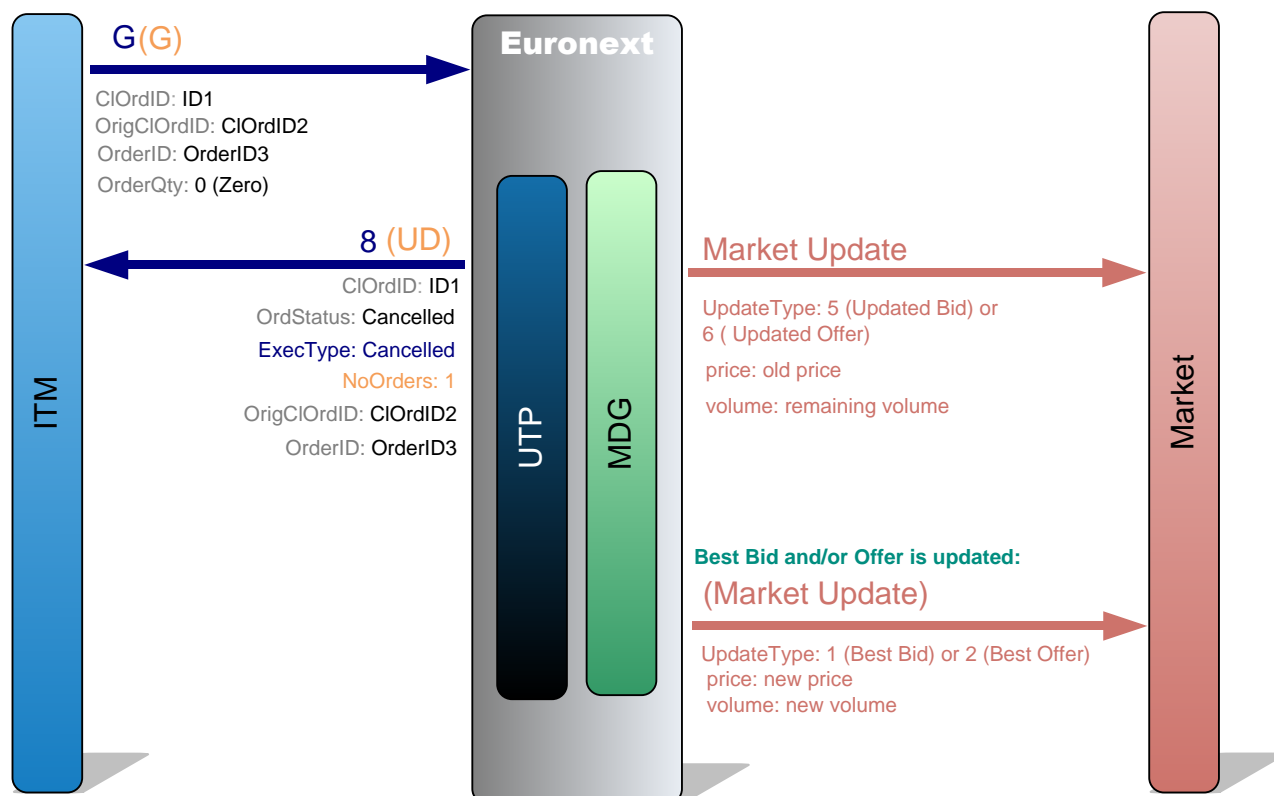


If the revision is accepted then the Exchange responds with an **Execution Report (8)** with ExecType = Replaced. The OrigCIOrdID or OrderID identifies each cancelled order.

The CIOrdID contains the client order revision request ID.

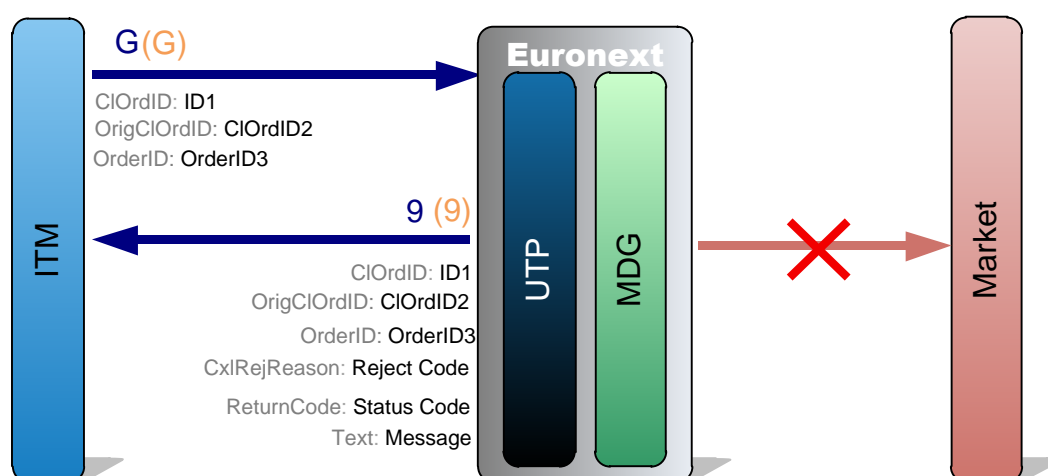
An MDG Market Update message containing the new price and/or new volume is disseminated to the market, and if the new price becomes the best limit, then an additional MDG Market Update is disseminated for this new Best Bid or Best Offer.

If the OrderQty is equal to 0, then this is treated as a Cancellation request:



A public MDG Market Update message for the cancellation of the order is sent to the market. If the cancellation impacts the best limit, then another MDG Market Update message is sent to inform the market of the new Best Bid or Best Offer.

4.1.2 Order Revision Request Rejected



If the revision is rejected then the Exchange responds with an **Order Cancel Reject (9)** message. The OrderID contains either the Order ID allocated by the Exchange or the word 'NONE'.

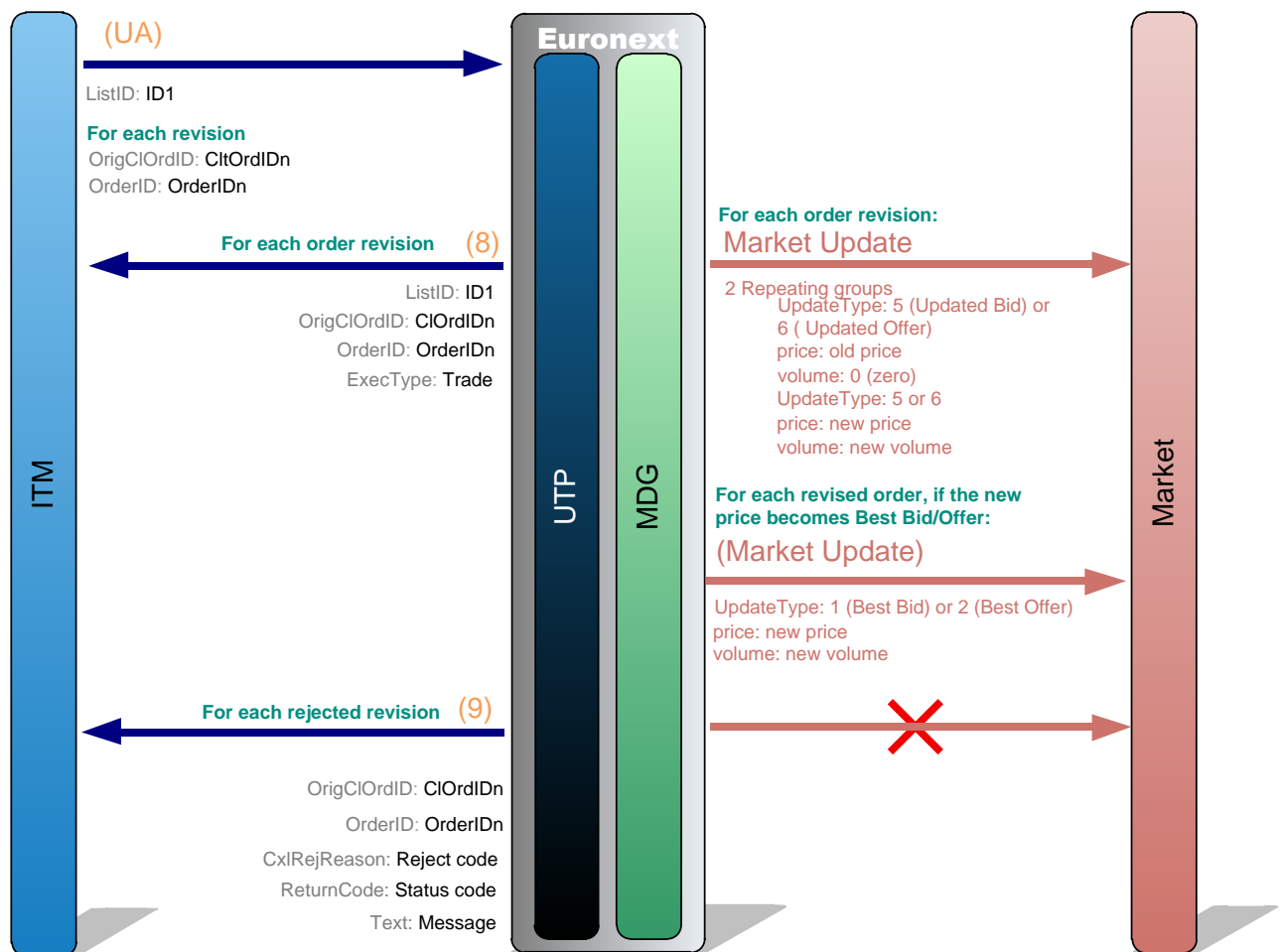
The CxlRejReason contains a code for the rejection reason. If the CxlRejReason is set to 'Other', then the status code is given in the ReturnCode.

When necessary, an explanation will also be provided in the Text field.

No MDG Market Update message is sent to the Market.

4.2 ORDER REVISION LIST (BINARY ONLY)

4.2.1 Order Revision List Accepted



If a revision in the list is accepted then the Exchange responds with an **Execution Report (8)** with ExecType = Replaced.

The ListID contains the unique client identifier for the request.

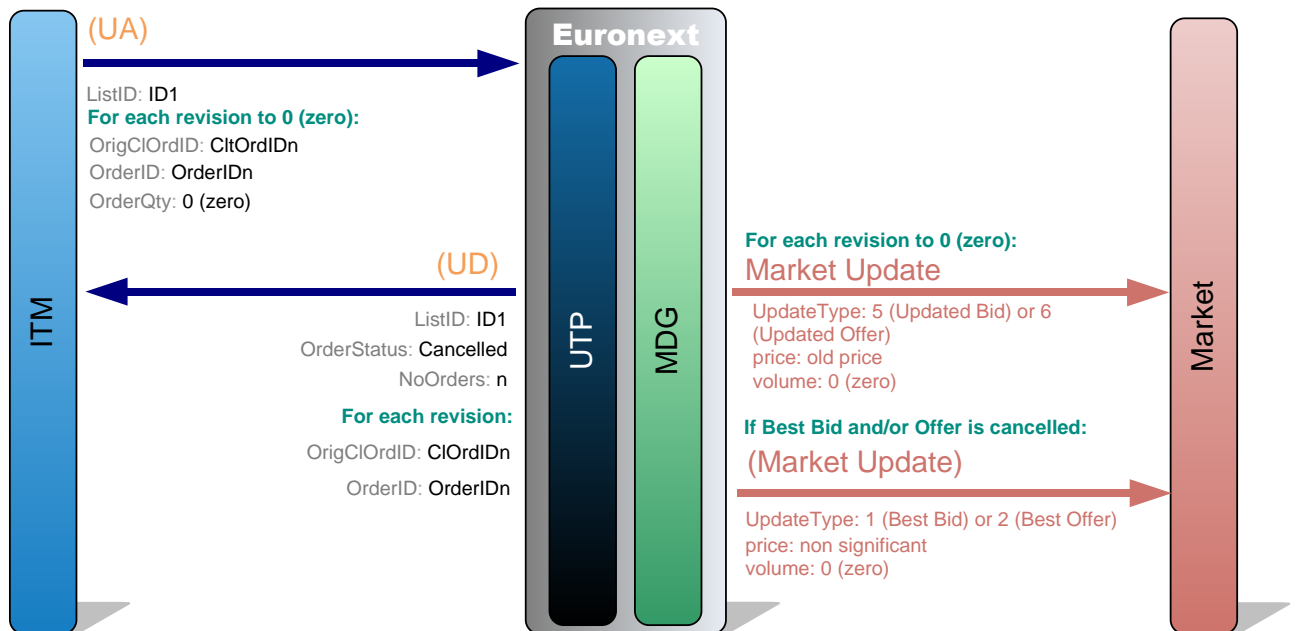
For each order successfully revised within the list:

- The Exchange responds with an Execution Report with ExecType = Replaced
- The OrderID or the OrigClOrderID is used to identify the revised order.
- *A MDG Market Update message containing the new price and/or new volume is disseminated to the market, and if the new price becomes the best limit, then another MDG Market Update is disseminated for this new Best Bid or Best Offer.*

For each order revision rejected within the list, the Exchange responds with an **Order Cancel Reject (9)** message:

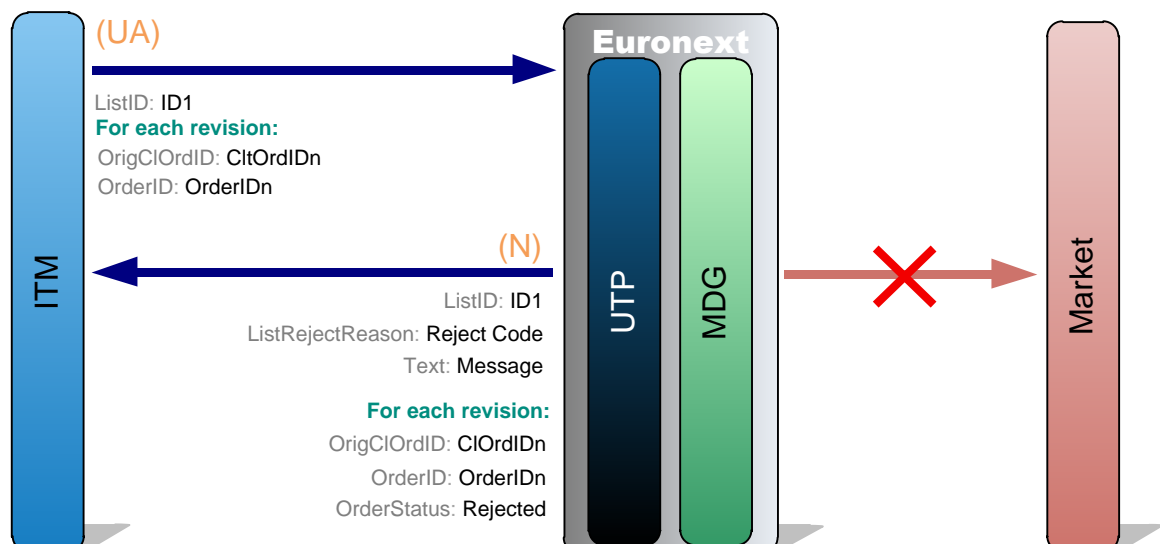
- The OrderID contains either the Order ID allocated by the Exchange or the value 0 (zero).
- The CxlRejReason contains a code for the rejection reason. If the CxlRejReason is set to 'Other', then the status code is given in the ReturnCode.
- When necessary, an explanation will also be provided in the Text field.

If the OrderQty is revised to 0 (zero) this is treated as a Cancellation request:



A public MDG Market Update message related to the cancellation of the order is sent to the market. If the cancellation impacts the best limit, then another MDG Market Update message is sent to inform the market of the new Best Bid or Best Offer.

4.2.2 Order Revision List Rejected



If all orders in the list are rejected, then the Exchange responds with a **ListStatus (N)** message.

The ListRejectReason contains a code for the rejection reason.

When necessary, an explanation will also be provided in the Text field.

For each order revision that was requested, this message contains the OrigClOrdID, OrderID and the OrdStatus = Rejected.

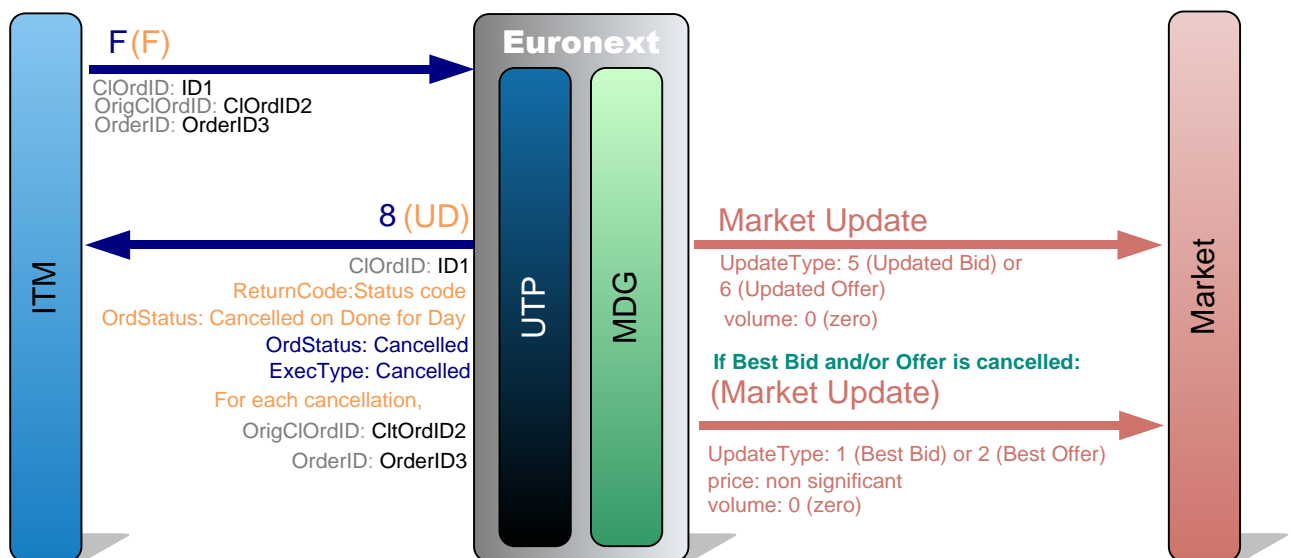
The OrderID contains either the Order ID allocated by the Exchange or the value 0 (zero).

No MDG Market Update message is sent to the Market.

5. CANCELLING ORDER(S)

5.1 ORDER CANCEL REQUEST

5.1.1 Order Cancel Request Accepted



The OrderID or the OrigCIOrdID is used to identify the order to be cancelled.

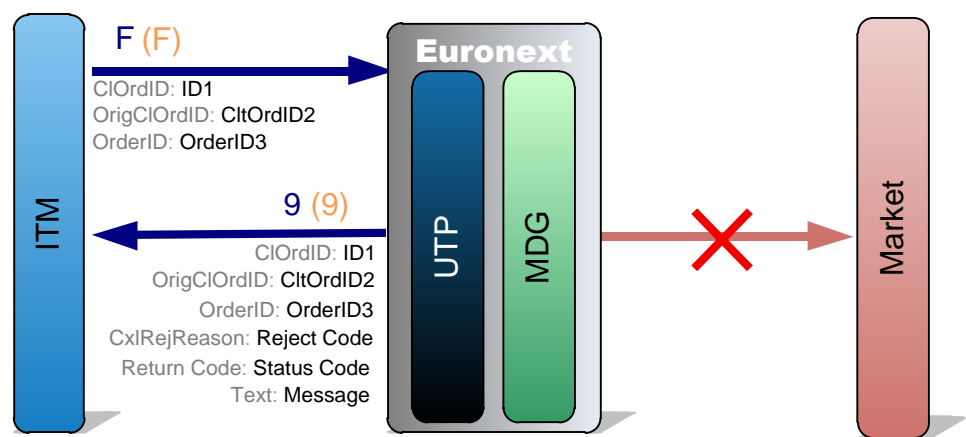
The CIOrdID contains the client order cancel request ID.

In the FIX 5.0 protocol, if the cancellation is accepted then the Exchange responds with an **Execution Report (8)** with ExecType = Cancelled and OrdStatus = Cancelled.

In the Binary protocol, if the cancellation is accepted, then the Exchange responds with a **Cancel Notification List (UD)**.

A public MDG Market Update message is sent to the market to remove the cancelled order. If the cancellation impacts the best limit, then another MDG Market Update message is sent to inform the market of the new Best Bid or Best Offer.

5.1.2 Order Cancel Request Rejected



If the cancellation is rejected then the Exchange responds with an **Order Cancel Reject (9)** message (Bin & FIX 5.0).

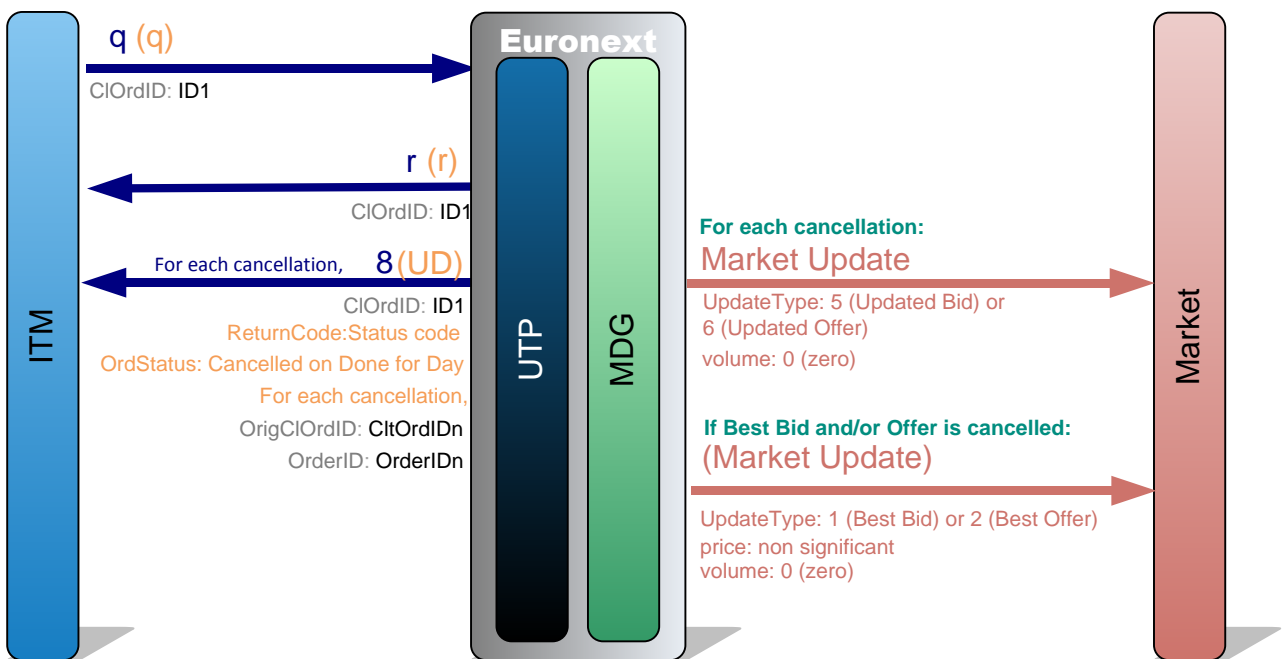
The CxlRejReason contains a code for the rejection reason. If the CxlRejReason is set to 'Other', the status code is given in ReturnCode.

When necessary, an explanation will also be provided in the Text field.

No MDG Market Update message is sent to the Market.

5.2 ORDER MASS CANCEL REQUEST

5.2.1 Order Mass Cancel Request Accepted



In FIX 5.0, if the mass cancellation is accepted then the Exchange responds with an **Order Mass Cancel Report (r)** and an **Execution Report (8)** for each cancelled order with OrdStatus = Cancelled and ExecType = Cancelled.

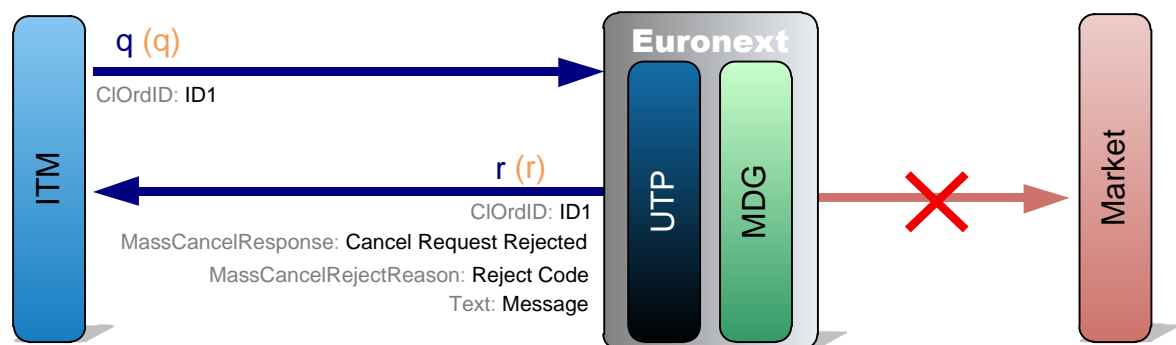
In the Binary protocol, if the mass cancellation is accepted then the Exchange responds with an Order Mass Cancel Report (r) and a Cancel Notification List (UD).

The ClOrdID contains the client mass cancel request ID.

The OrigClOrdID or OrderID identifies the order.

For each successfully cancelled order, a public MDG Market Update message is sent to the market to remove the cancelled order. If the cancellation impacts the best limit, then another Market Update message is sent to inform the market of the new Best Bid or Best Offer.

5.2.2 Order Mass Cancel Request Rejected



If the mass cancellation is rejected, then the Exchange responds with an **Order Mass Cancel Report (r)** message which has a MassCancelResponse indicating that the cancellation failed.

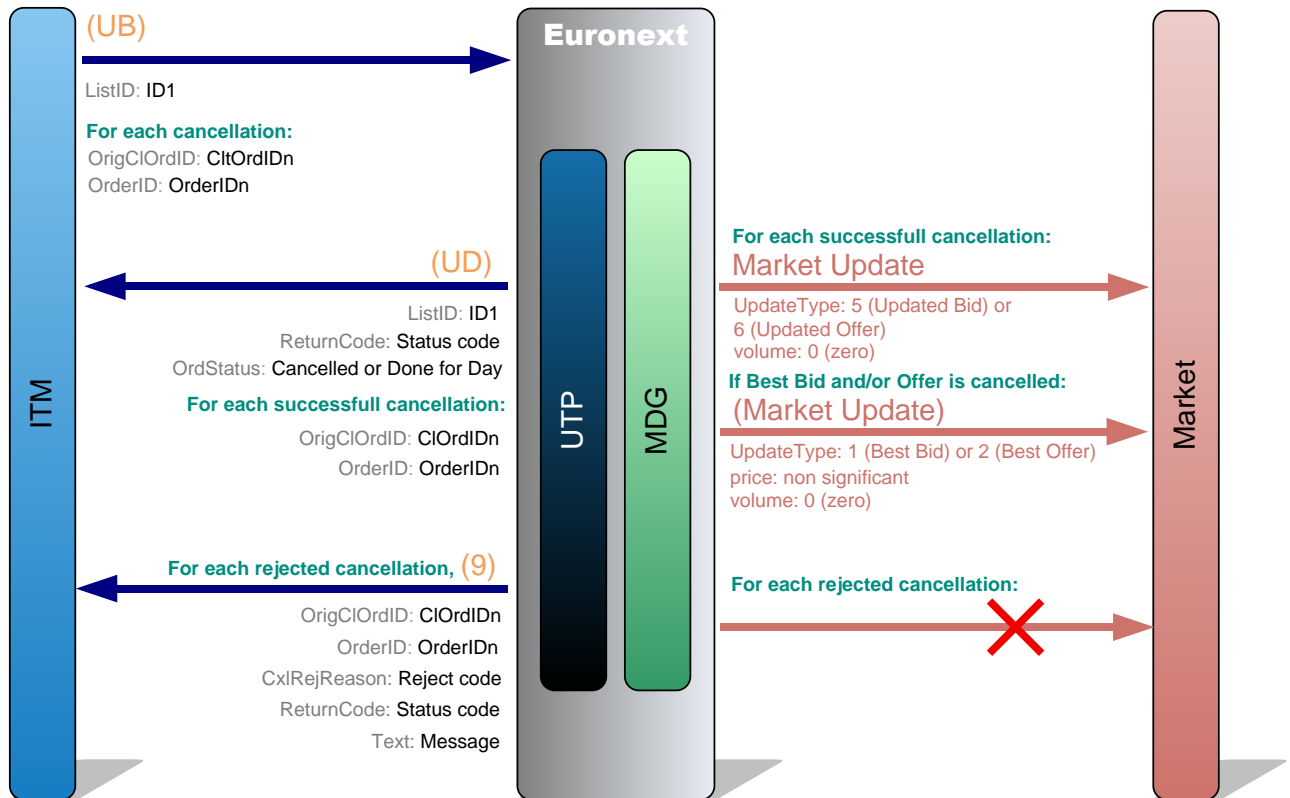
The MassCancelRejectReason contains a code for the rejection reason.

When necessary, an explanation will also be provided in the Text field.

No MDG Market Update message is sent to the Market.

5.3 ORDER CANCEL LIST (BINARY ONLY)

5.3.1 Order Cancel List Accepted



If a cancel request in the list is accepted, then the Exchange responds with an Cancel Notification List (UD)

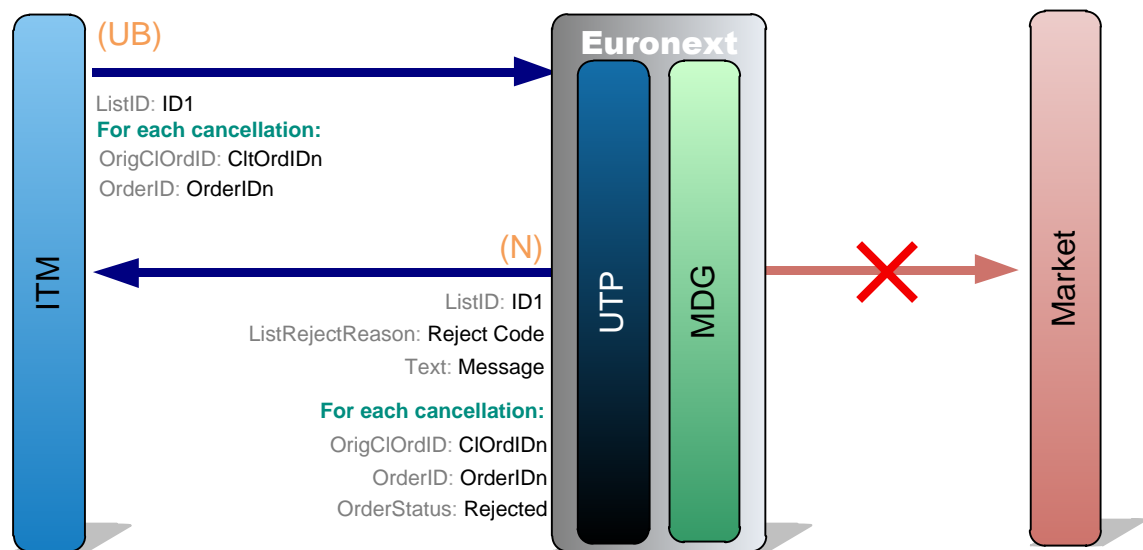
The ListID contains the unique client's identifier for the request.

For each successfully cancelled order, a public MDG Market Update message is sent to the market to remove the cancelled order. If the cancellation impacts the best limit, then another MDG Market Update message is sent to inform the market of the new Best Bid or Best Offer.

For each order cancellation rejected within the list, the Exchange responds with an Order Cancel Reject (9) message: The OrderID contains either the Order ID allocated by the Exchange or the value 0 (zero).

- The CxlRejReason contains a code for the rejection reason. If the CxlRejReason is set to 'Other', the status code is given in the ReturnCode.
- When necessary, an explanation will also be provided in the Text field.

5.3.2 Order Cancel List Rejected



If all the orders in the list are rejected then the Exchange responds with a **ListStatus (N)** message. The ListRejectReason contains a code for the rejection reason.

When necessary, an explanation will also be provided in the Text field.

For each order cancellation that was requested, this message contains the OrigClOrdID, OrderID and the OrdStatus = Rejected.

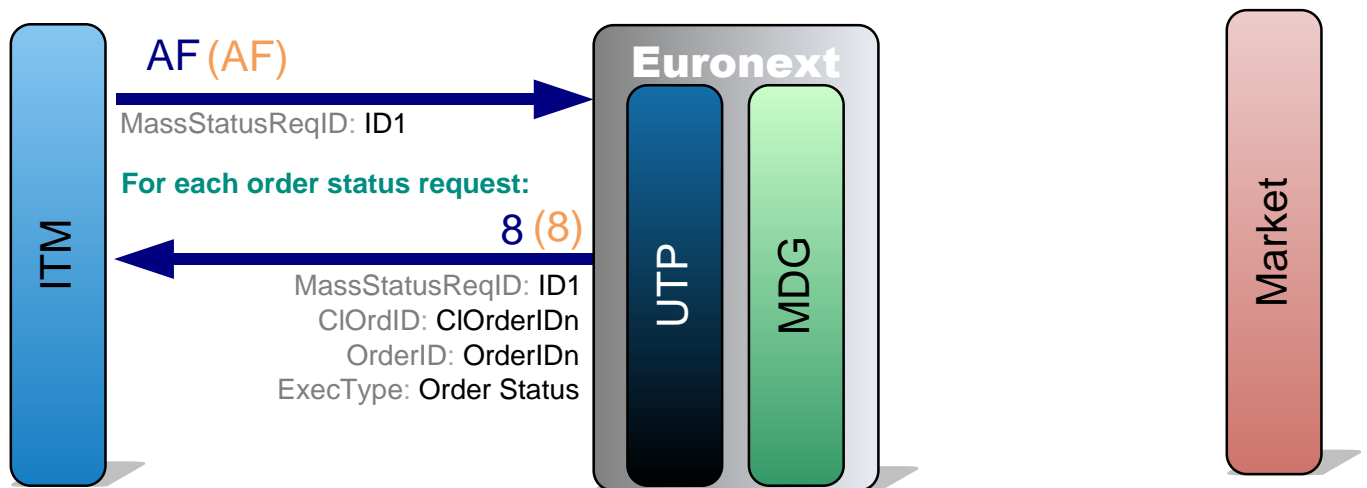
The OrderID contains either the Order ID allocated by the Exchange or the value 0 (zero).

No MDG Market Update message is sent to the Market.

6. SENDING A REQUEST

6.1 ORDER MASS STATUS REQUEST

6.1.1 Order Mass Status Request Accepted



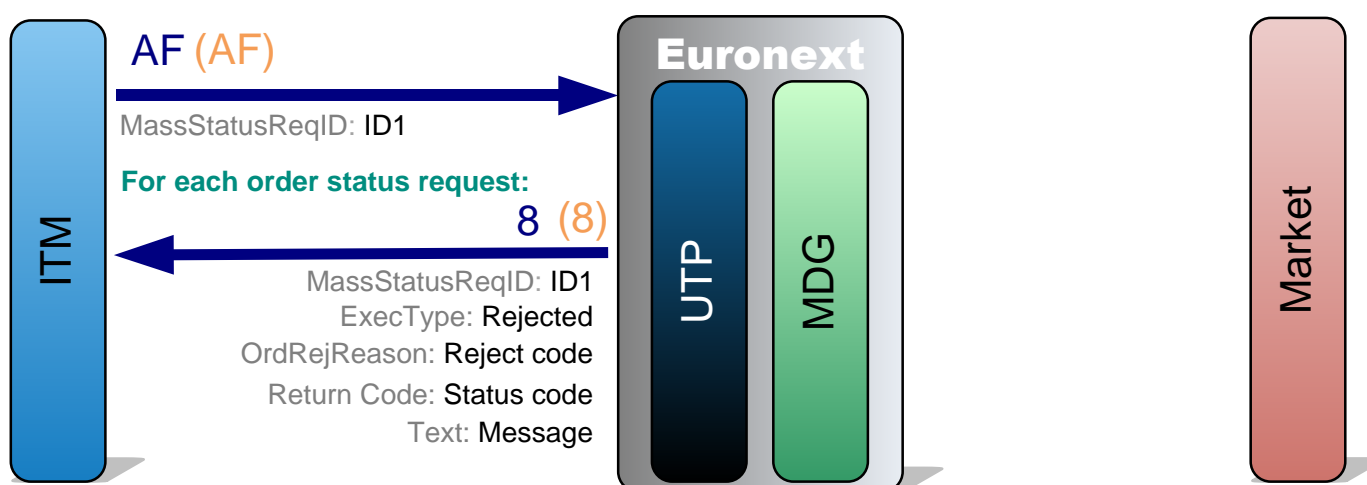
If the Mass-Status request is accepted then the Exchange responds with an **Execution Report (8)** with an ExecType = Order Status for each resting order.

The CLOrdID or OrderID returned in the Execution Report identifies each order.

The MassStatusReqID contains the client order mass status request ID.

No MDG Market Update message is sent to the Market.

6.1.2 Order Mass Status Request Rejected



If the Mass-Status request is rejected, then the Exchange responds with an **Execution Report (8)** with the ExecType = Rejected.

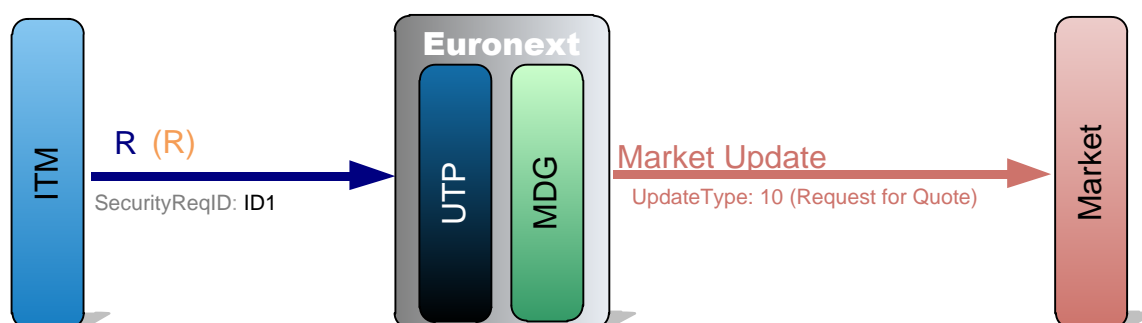
The OrdRejReason contains a code for the rejection reason. If the OrdRejReason is set to 'Other', the status code is given in the ReturnCode.

When necessary, an explanation will also be provided in the Text field.

No MDG Market Update message is sent to the Market.

6.2 QUOTE REQUEST

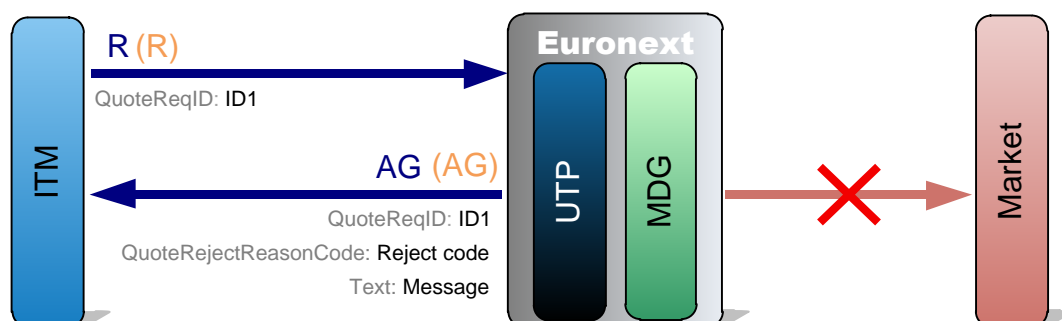
6.2.1 Quote Request Accepted



If the quote request is accepted, then the Exchange will not reply with an acknowledgement message to the ITM.

Market Makers are notified of the quote request via the MDG Market Update message with UpdateType = '10' (Request for Quote). The new series are only available on subsequent Market Update messages when Market Makers have provided quotes or orders have been placed.

6.2.2 Quote Request Rejected



If the quote request is rejected, then the Exchange responds with a **Quote Request Reject (AG)** message.

The QuoteReqID is used to identify the rejected Quote Request.

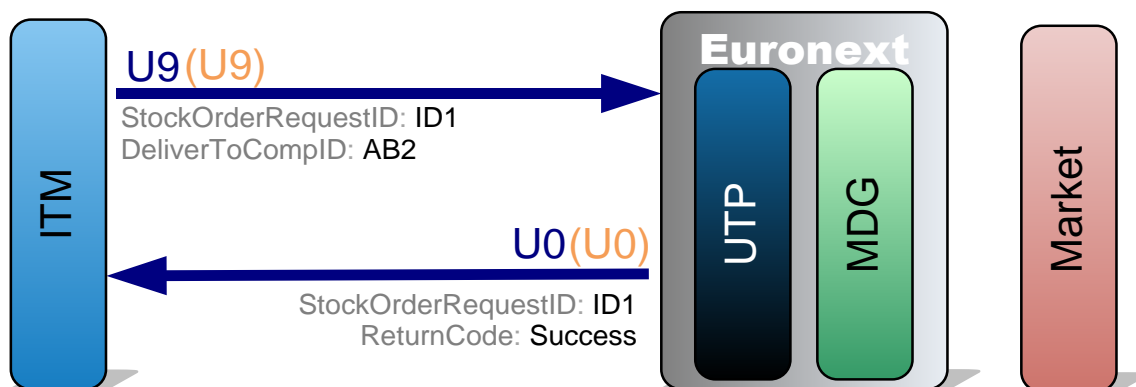
The QuoteRequestRejectReason contains a code for the rejection reason.

When necessary, an explanation will also be provided in the Text field.

No MDG Market Update message is sent to the Market.

6.3 STOCK ORDER ROUTING REQUEST

6.3.1 Stock Order Routing Request Accepted

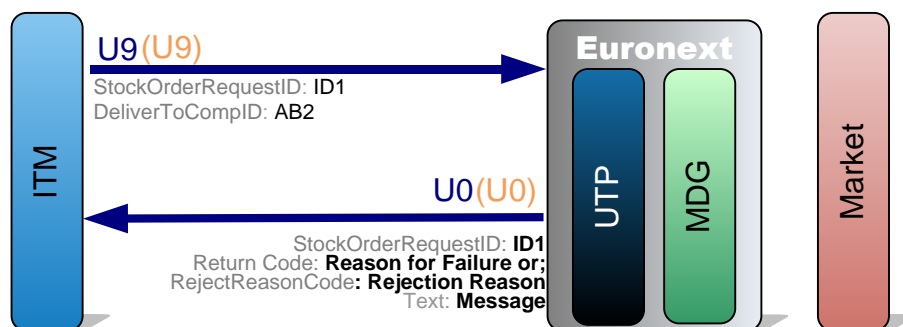


If a stock order routing request is successfully sent to the recipient (identified by DeliverToCompID) then the Exchange responds with a **Stock Order Routing Response (U0)** with Return Code = Success.

The StockOrderRequestID is allocated by the Client to identify the Stock Order Routing Request.

No MDG Market Update message is sent to the Market.

6.3.2 Stock Order Routing Request Rejected



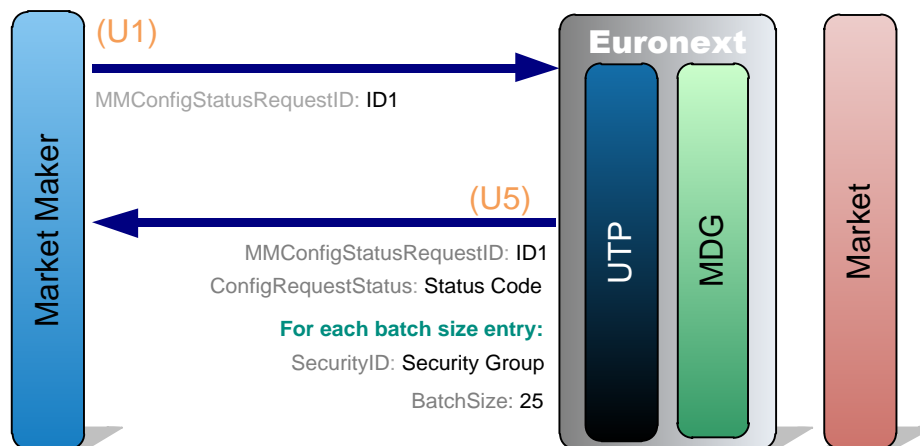
If a stock order routing request is not successfully sent to the recipient then the Exchange responds with a **Stock Order Routing Response (U0)** with either the Return Code or RejectReasonCode showing the reason for the failure.

When necessary, an explanation will also be provided in the Text field.

No MDG Market Update message is sent to the Market.

6.4 MM CONFIGURATION STATUS REQUEST (BINARY ONLY)

6.4.1 MM Configuration Status Request Accepted



The Exchange responds to a market maker configuration status request with a **MM Configuration Status Request Ack (U5)**.

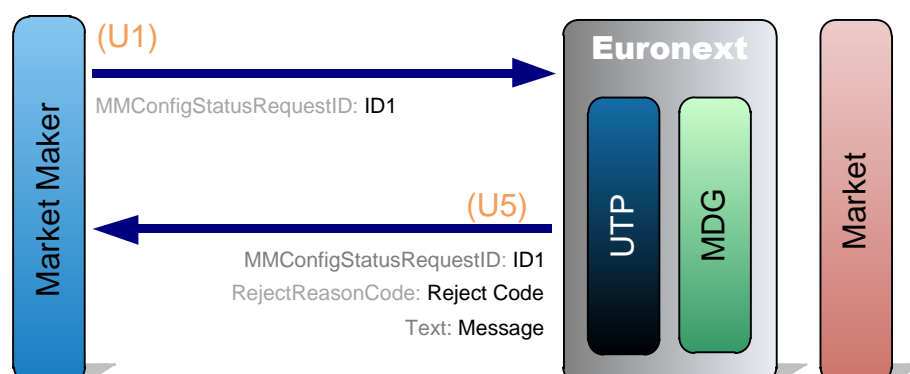
The MMConfigStatusRequestID identifies the request.

The ConfigRequestStatus provides the Market Maker with his trading rights associated to his ITM.

For each batch size entry, the message reports the quote batch size that the Market Maker may submit per message per Security Group.

No MDG Market Update message is sent to the Market.

6.4.2 MM Configuration Status Request Rejected



If the entire MM Configuration Status Request (U1) is rejected then the Exchange also responds with a MM Configuration Status Request Ack (U5).

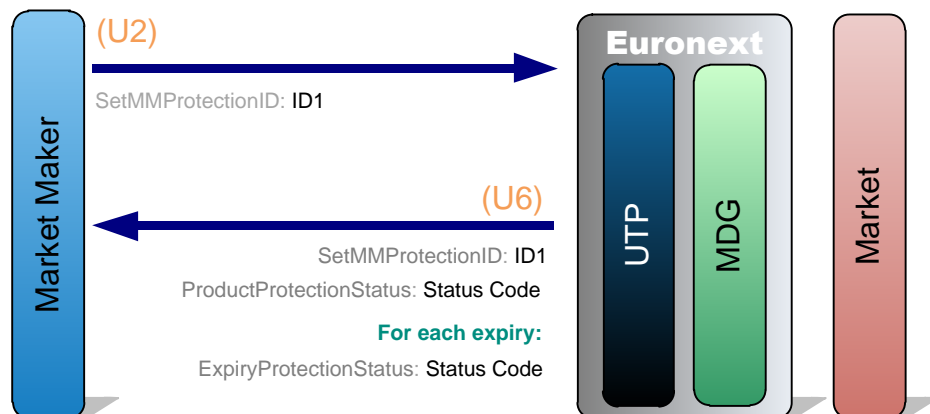
The RejectReasonCode contains a code for the rejection reason.

When necessary, an explanation will also be provided in the Text field.

No MDG Market Update message is sent to the Market.

6.5 SET MM PROTECTION (BINARY ONLY)

6.5.1 Set MM Protection Accepted



The Exchange responds to a Set MM Protection request with a **Set MM Protection Ack (U6)**.

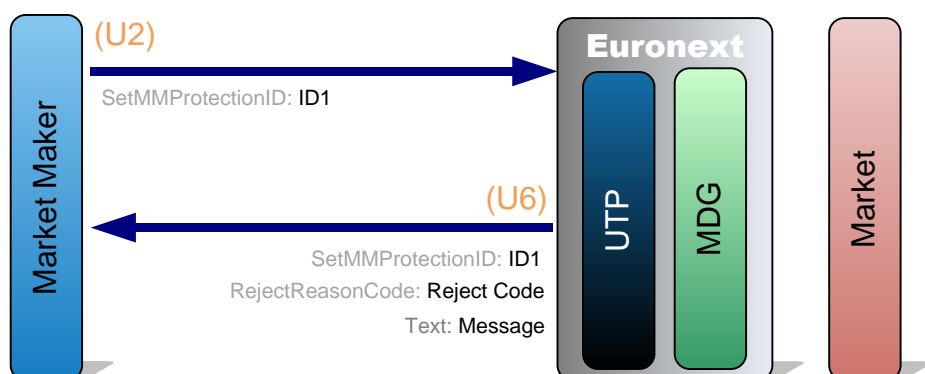
The SetMMProtectionID identifies the request.

The success or failure of the request is reported in the ProductProtectionStatus and ExpiryProtectionStatus for each expiry.

The repeating ExpiryProtectionStatus is in the same order as the repeating expiry limit request on the Set MM Protection (U2) message.

No MDG Market Update message is sent to the Market.

6.5.2 Set MM Protection Rejected



If the entire **Set MM Protection (U2)** message is rejected then the Exchange also responds with a **Set MM Protection Ack (U6)**.

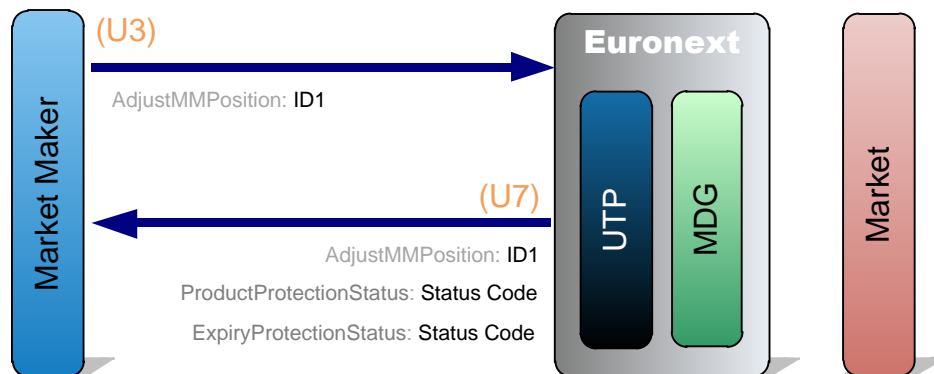
The RejectReasonCode contains a code for the rejection reason.

When necessary, an explanation will also be provided in the Text field.

No MDG Market Update message is sent to the Market.

6.6 ADJUST MM POSITION (BINARY ONLY)

6.6.1 Adjust MM Position Accepted



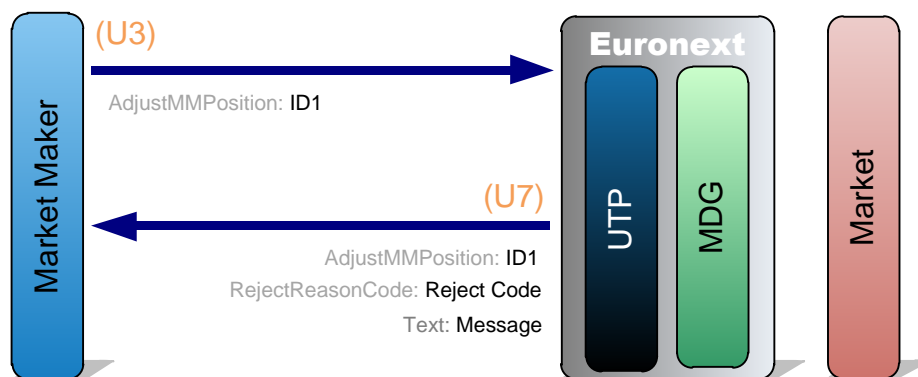
The Exchange responds to an Adjust MM Position with an **Adjust MM Position Ack (U7)**.

The AdjustMMPositionID identifies the request.

The success or failure of the request is reported in the ProductProtectionStatus and ExpiryProtectionStatus.

No MDG Market Update message is sent to the Market.

6.6.2 Adjust MM Position Rejected



If the entire **Adjust MM Position (U3)** message is rejected then the Exchange also responds with **Adjust MM Position Ack (U7)**.

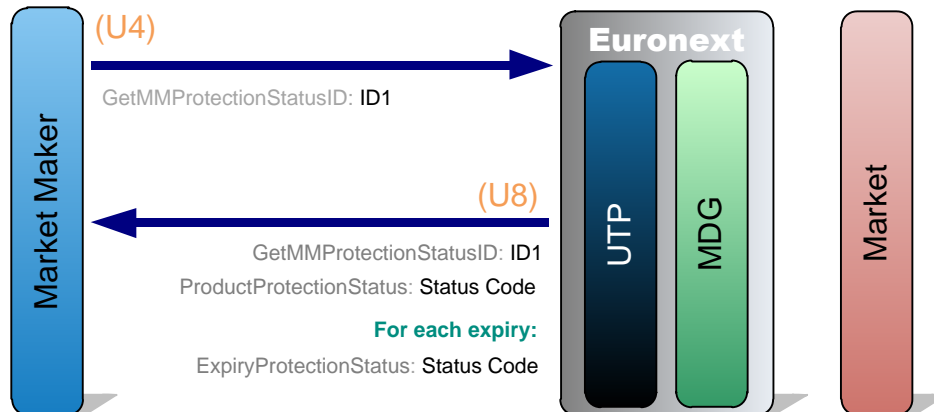
The RejectReasonCode contains a code for the rejection reason.

When necessary, an explanation will also be provided in the Text field.

No MDG Market Update message is sent to the Market.

6.7 GET MM PROTECTION STATUS (BINARY ONLY)

6.7.1 Get MM Protection Status Accepted



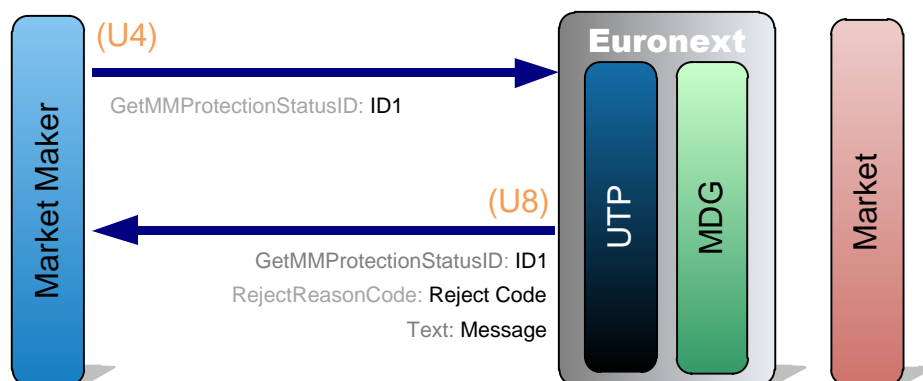
The Exchange responds to a Get MM Protection Status request with a **Get MM Protection Status Ack (U8)**.

The GetMMProtectionStatusID identifies the request.

The success or failure of the request is reported in the ProductProtectionStatus and ExpiryProtectionStatus for each expiry.

No MDG Market Update message is sent to the Market.

6.7.2 Get MM Protection Status Rejected



If the entire **Get MM Protection Status (U4)** message is rejected then the Exchange also responds with **Get MM Protection Status Ack (U8)**.

The RejectReasonCode contains a code for the rejection reason.

When necessary, an explanation will also be provided in the Text field.

No MDG Market Update message is sent to the Market.

7. TRADING KINEMATICS

7.1 GENERAL PRINCIPLES

As a general principle, for each instrument that trades, UTP-D sends the following public information to the Market in the following sequence:

- Changes in the order book (new depth of book price and/or volume).
- Changes in the Best Bid and/or Offer price(s).
- Trade information, by price level.
- Some value-added parameters (e.g. cumulative volume, high and low prices...)

In the case of an outright trade (explicit versus explicit, implied-out versus explicit, or implied-out versus implied-out), for each level of traded price, the following data are sent:

- The Trade information for conventional trade (update type '24' in Market Update message) or wholesale trade (Update Type '27' to '34') with total traded volume (Update Type '7').
- The Value-added parameters of the outright:
 - Prices (Daily High/Low, Yearly High/Low, Open Price, LTP, Percentage Change)
 - Cumulative volume.

In the case of a strategy trade, for each level of traded price, the following data are sent:

- The Strategy Trade information for conventional trade (Update Type '24' in Market Update message) or wholesale trade (Update Type '27' to '34' in Market Update message) with total traded volume (Update Type '7').
- For each constituent leg of the strategy:
 - The strategy leg conventional trade (Update Type '37' in Market Update Message) or strategy leg wholesale trade (Update Type '37' to '45') with total traded volume (Update Type '7').

They are described as follows:

Market Update SymbolIndex: M1
 UpdateType: 1 (Best Bid) 100 @ 100



In the example above, M1 denotes the instrument, and '100 @ 100' means a limit set at a price of 100 (the currency being implied, no spot conversion done) for a volume of 100.

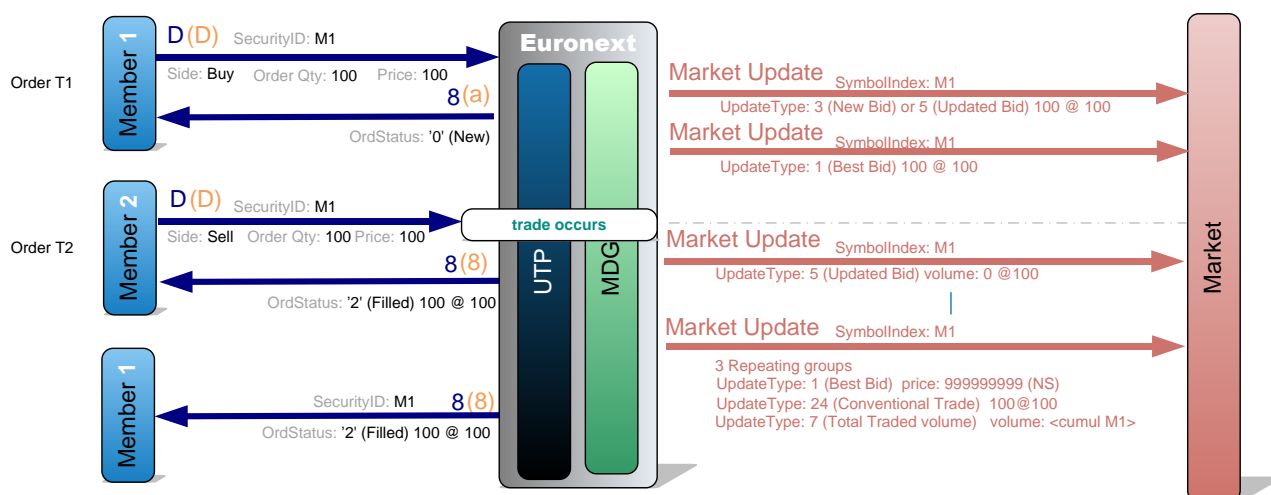
Important Note: Given the complexity of transactions and market events on derivatives markets, it is not technically possible to guarantee message sequencing.

7.2 EXPLICIT VERSUS EXPLICIT IN OUTRIGHT

The example below illustrates the matching of an explicit order with another explicit order in an outright instrument's order book:

M1					
Bid			Offer		
Time	Qty	Price	Price	Qty	Time
T1	100	100	100	100	T2

In this case the following messages are sent:



UTP-D disseminates the following information for the outright instrument in the Market Update messages

- New incoming limits,
- Best limit(s) (if any),
- Conventional Trade information,
- Total Traded Volume on the instrument.
- Update of resting order book limits and best limit(s) (if impacted) after the trade.

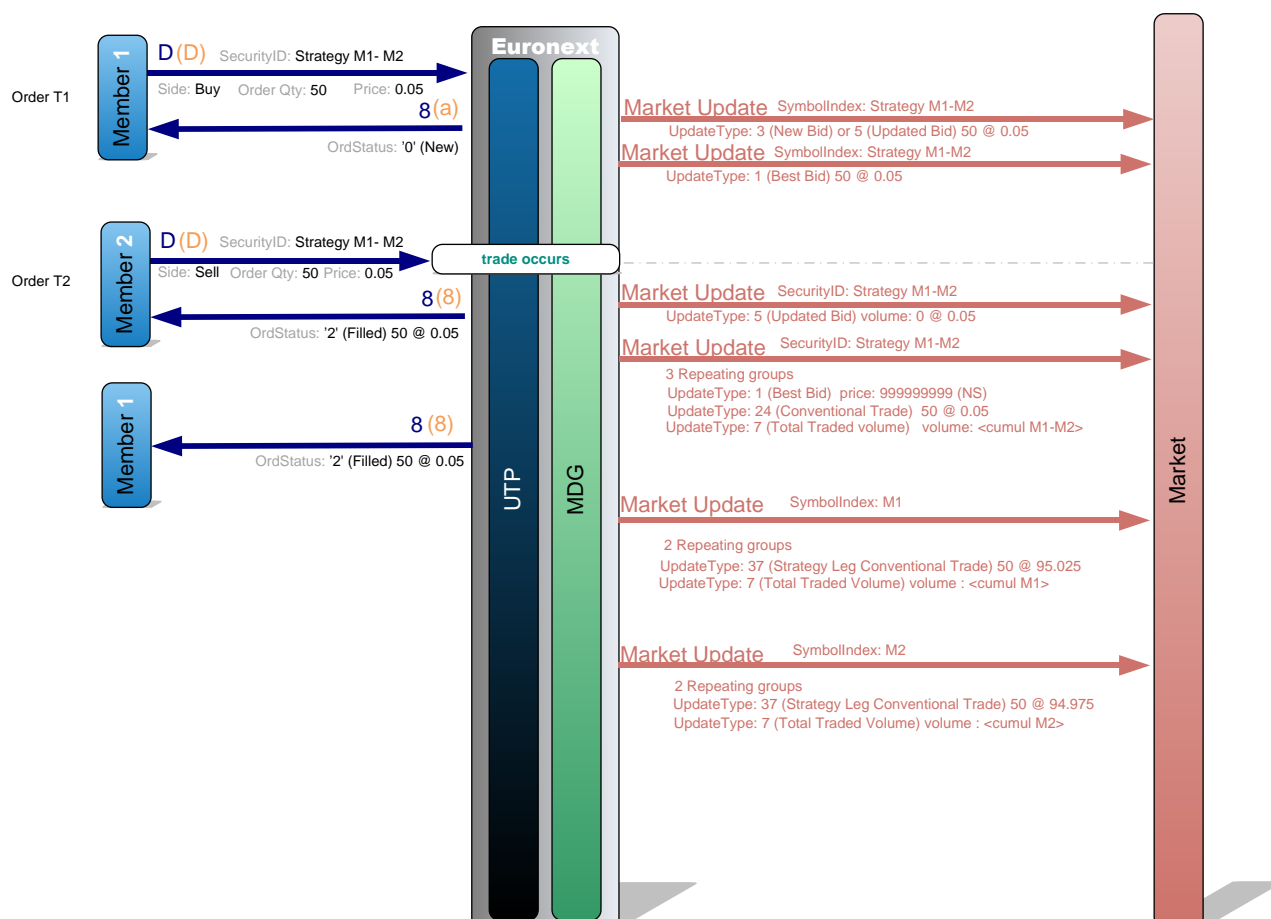
7.3 EXPLICIT VERSUS EXPLICIT IN STRATEGY

The example below illustrates the matching of an explicit order trading with an explicit order in a strategy instrument's order book:

M1						M2					
Bid			Offer			Bid			Offer		
Time	Qty	Price	Price	Qty	Time	Time	Qty	Price	Price	Qty	Time

M1-M2						
Calendar Spread						
		Bid		Offer		
Time	Qty	Price	Price	Qty	Time	
T1	50	0.05	0.05	50	T2	

In this case the following messages are returned:



UTP-D disseminates the following information in the Market Update message

- For each outright instrument being constituent of the strategy :
 - Strategy Leg Conventional Trade information,
 - Total Traded Volume on the instrument.

➤ for the strategy instrument:

- New incoming limits,
- Best Limit (if any),
- Conventional Trade information,
- Update of limits and best limit(s) (if impacted) after the trade.

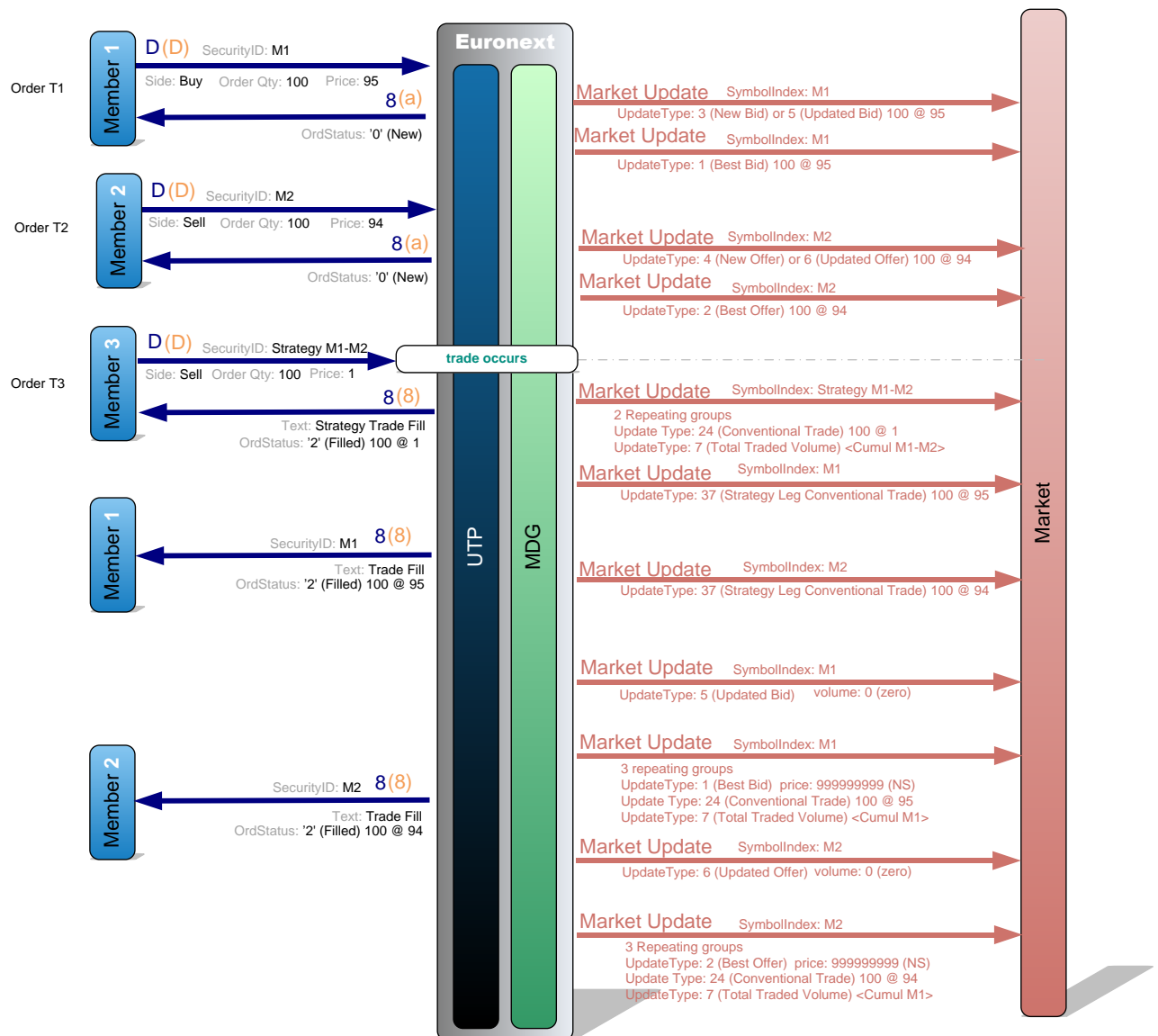
7.4 IMPLIED-IN VERSUS EXPLICIT IN STRATEGY

The example below illustrates the matching of an implied-in order trading with an explicit order in a strategy instrument's order book:

M1						M2					
Bid			Offer			Bid			Offer		
Time	Qty	Price	Price	Qty	Time	Time	Qty	Price	Price	Qty	Time
T1	100	95							94	100	T2

M1-M2 Calendar Spread					
Bid			Offer		
Time	Qty	Price	Price	Qty	Time
	<u>100</u>	<u>1</u>	1	100	T3

In this case the following messages are sent:



UTP-D disseminates the following information in the Market Update message:

- For each outright instrument leg of the strategy :
 - Strategy Leg Conventional Trade information,
 - Total Traded Volume on the leg.
 - Update of limits and best limit(s) after the trade.
- for the strategy instrument:
 - New incoming limits,
 - Best limit(s) if any,
 - Conventional Trade information,

- *Total Traded Volume on the instrument*
- *Update of limits and best limit(s) after the trade.*

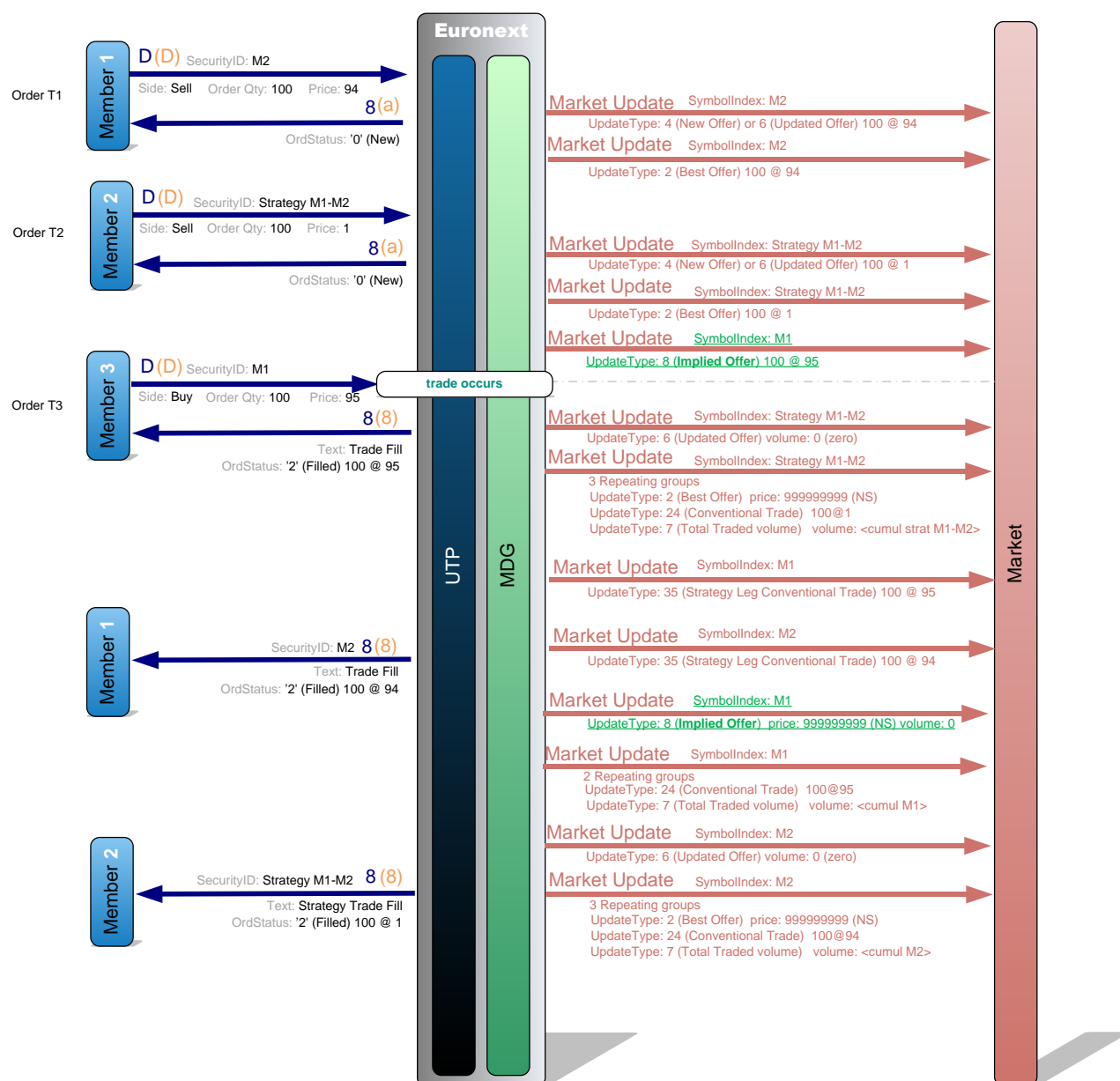
7.5 IMPLIED-OUT VERSUS EXPLICIT IN OUTRIGHT

The example below illustrates the matching of an implied-out order trading with an explicit order in an outright instrument's order book:

M1						M2					
Bid			Offer			Bid			Offer		
Time	Qty	Price	Price	Qty	Time	Time	Qty	Price	Price	Qty	Time
T3	100	95	95	100	I _{OUT}				94	100	T1

M1-M2 Calendar Spread					
Bid			Offer		
Time	Qty	Price	Price	Qty	Time
			1	100	T2

In this case the following messages are sent:



Note: Only the first level of **Implied-out** (the best priced implied) is generated in an outright instrument.

UTP-D disseminates the following information in the Market Update message:

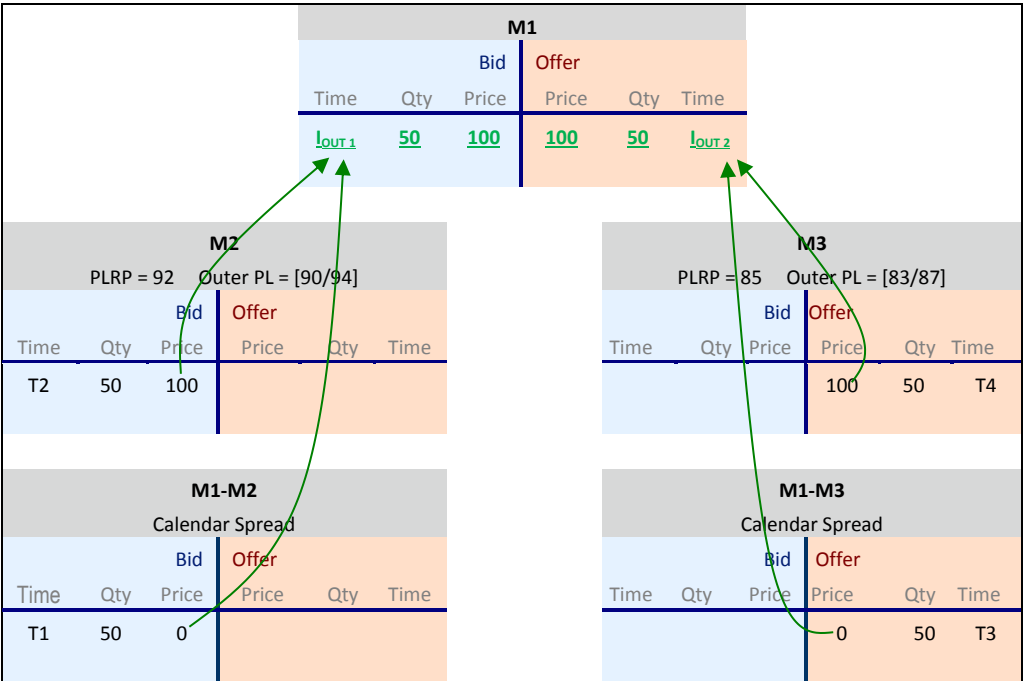
- For the outright instrument where a trade between an implied-out order and an explicit order occurs:
 - New incoming limits,
 - First level of the implied-out order,
 - Conventional trade information,
 - Total Traded Volume on the instrument
 - Updates of limits and best limit(s) after the trade.

- For each instrument (outright and strategy) involved in the Implied-Out route:

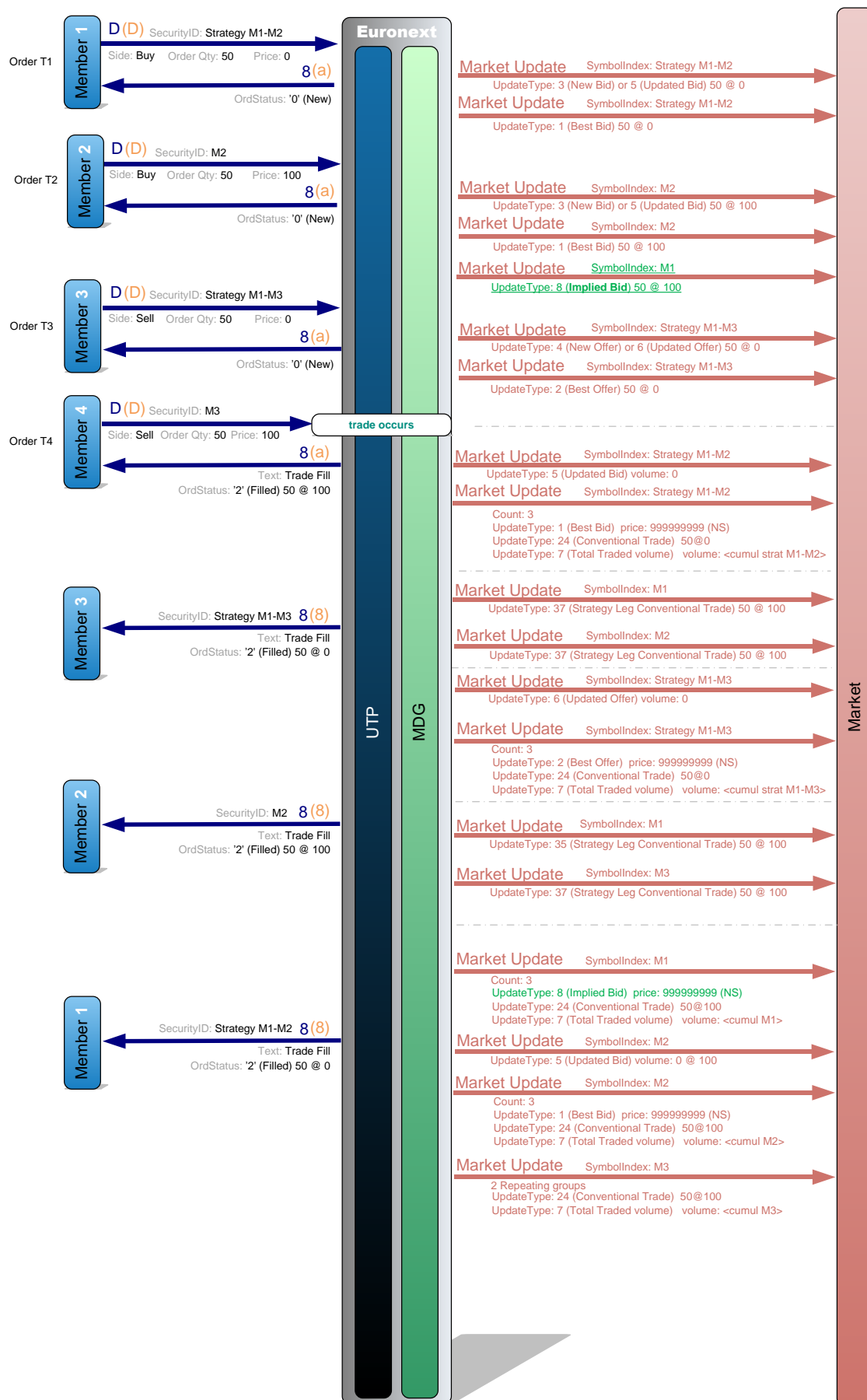
- New incoming limits,
- Strategy Leg Conventional Trade information,
- Conventional Trade information,
- Total Traded Volume on the instrument
- Updates of limits and best limit(s) after the trade.

7.6 IMPLIED-OUT VERSUS IMPLIED-OUT IN OUTRIGHT

The example below illustrates the matching of an implied-out order trading with another implied-out order in an outright instrument's order book:



In this case the following messages are sent :



UTP-D disseminates the following information in the Market Update message:

- For the outright instrument where a trade between an implied-out order and another implied-out order occurs:
 - New incoming limits,
 - First price level of the implied-out order,
 - Conventional Trade information,
 - Total Traded Volume on the instrument
 - Updates of limits and best limit(s) after the trade.

- For each outright instrument involved in the Implied-Out route:
 - New incoming limits,
 - Strategy Leg Conventional Trade information,
 - Conventional Trade information,
 - Total Traded Volume on the instrument
 - Updates of limits and best limit(s) after the trade.

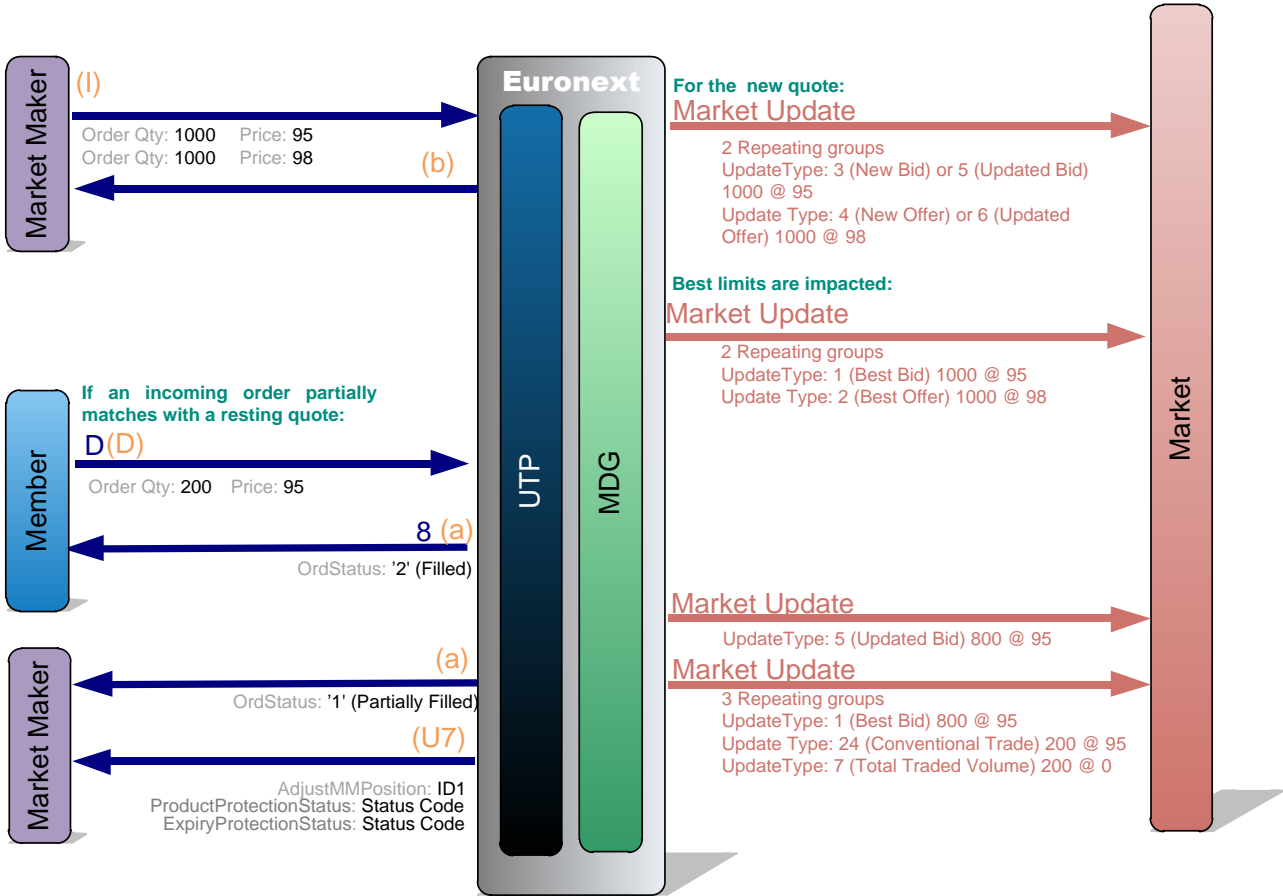
- For each strategy instrument involved in the Implied-Out route:
 - New incoming limits and best limit(s) if impacted,
 - Conventional Trade information,
 - Total Traded Volume on the instrument
 - Updates limits and best limits after the trade.

7.7 QUOTE VERSUS EXPLICIT (MM PROTECTION)

The example below illustrates the matching of a quote with an explicit order in an outright instrument's order book:

Outright Instrument					
Bid			Offer		
Time	Qty	Price	Price	Qty	Time
Quote T1	1000	95	95	200	T2
			98	1000	Quote T1

In this case the following messages are sent:



When an outright or strategy trade occurs with a quote where Market Maker Protection is in place, then the **Execution Report (8)** would be followed by an **Adjust MM Position Ack (U7)** message.

Whether the market maker protection is successfully or unsuccessfully adjusted, it is reported in the ProductProtectionStatus and ExpiryProtectionStatus.

UTP-D disseminates the following information in the Market Update message:

- New incoming limits,
- Best limit(s) (if any),
- Conventional Trade information,
- Total Traded Volume on the instrument.
- Update of limits and best limit(s) (if impacted) after the trade.

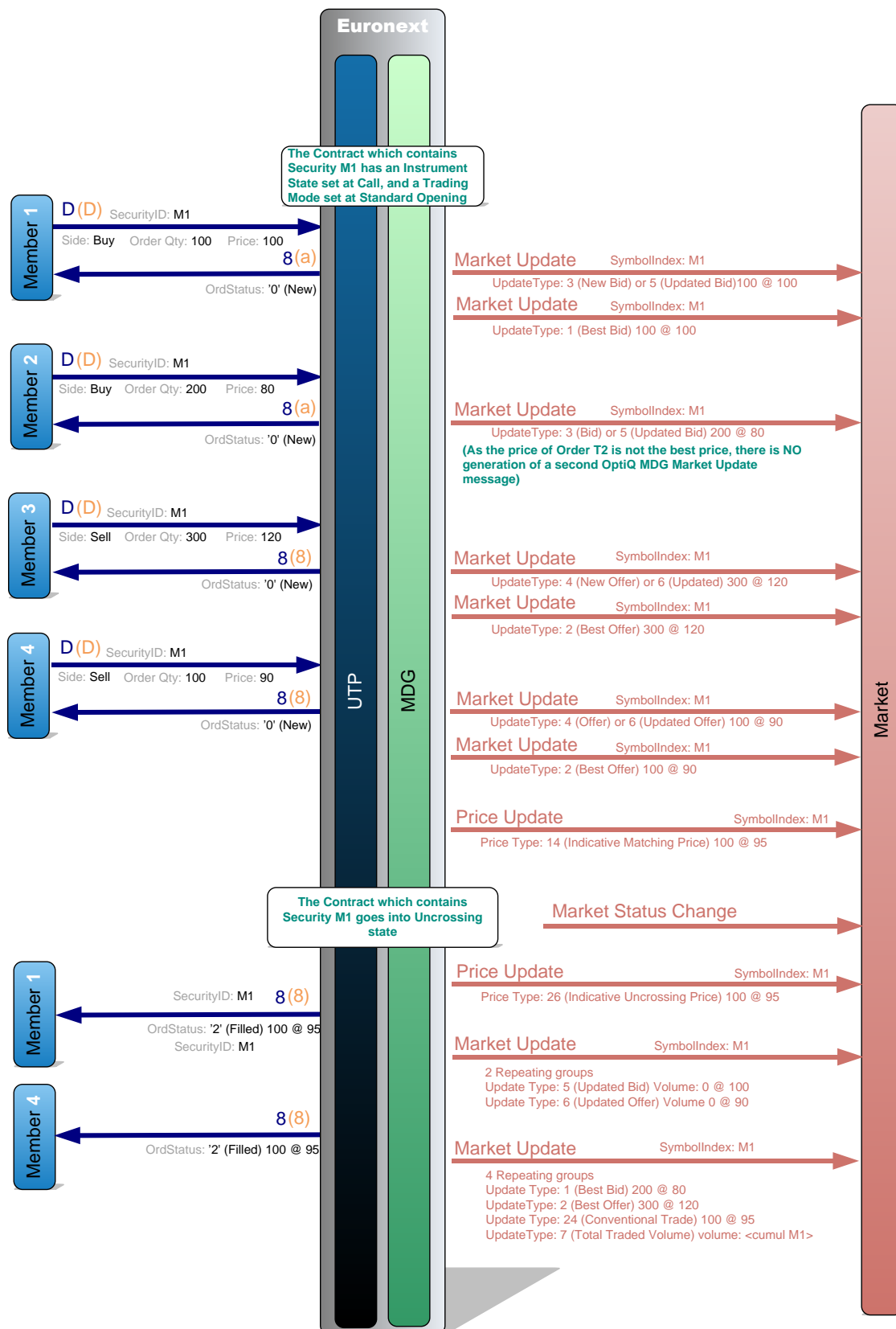
7.8 IOP

The example below illustrates the matching of an explicit order trading with an explicit order at the opening:

M1					
Bid			Offer		
Time	Qty	Price	Price	Qty	Time
T1	100	100	90	100	T4
T2	200	80	120	300	T3

The uncrossing price is 95.

When the market state of the contract which contains the outright instrument M1 changes from Pre-Open to Open state the following messages are sent:



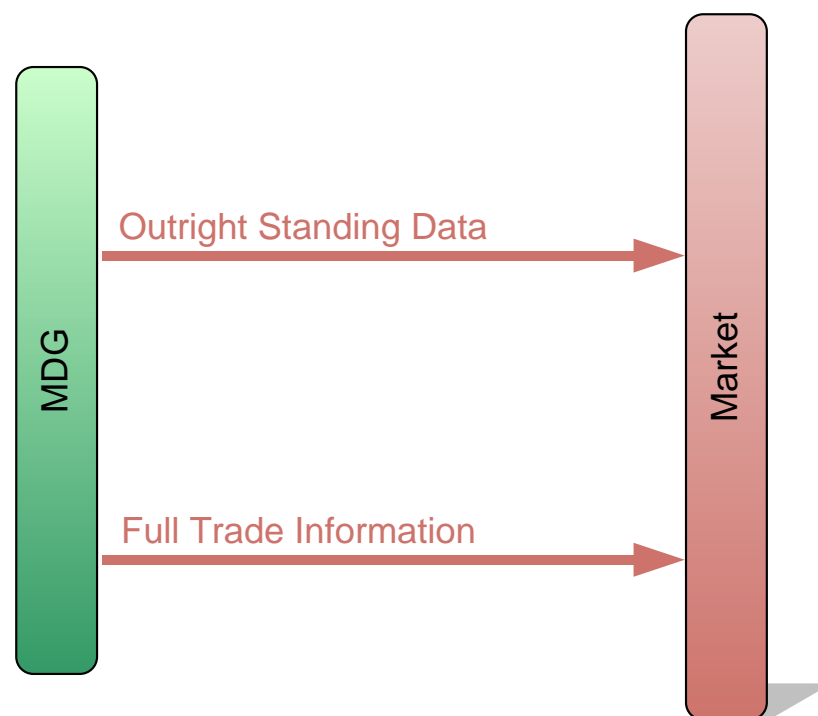
UTP-D disseminates the following information in the Market Update message:

- New incoming limits,
- Best limit(s) (if any),
- Indicative Opening Price and volume,
- Conventional Trade information,
- Total Traded Volume on the instrument.
- Update of limits and best limit(s) (if impacted) after the trade.

7.9 WHOLESALE TRADES – ATOMX FLEX TRADES

Market data is disseminated through MDG for wholesale trades, just as they are by XDP-D, however, the matching engine is not involved.

The sequence is described as follows:



For AtomX Flex trades:

- The Standing Data message provides all needed referential data on the instrument involved in the trade,
- The Market Update message, with an update type set at 'AtomX Trade', indicates associated price and volume,
- The Full Trade Information provides all details of the trade (as for a trade in the central order book).

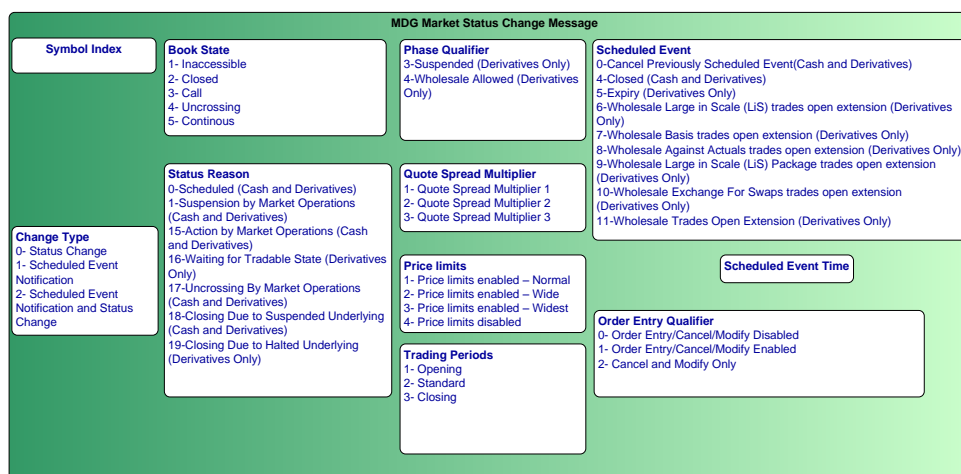
8. SCHEDULE KINEMATICS

This section is dedicated to all market publications that deal with changes of Market Status on Euronext Cash markets, which are communicated via the Market Status Change (1005) message.

The Optiq MDG Market Status Change (1005) is common across all Euronext Markets, including Cash, Warrants and off-book data publication. The Market Status of an instrument can be determined using the following fields:

- **Book State:** Market State of the Contract
- **Status Reason:** Book State origin
- **Phase Qualifier:** Specifics during a trading phase that do not impact the Book State
- **Scheduled Event:** Market Event notification
- **Scheduled Event Time:** Scheduled Event associated time if required
- **Quote Spread Multiplier :** Multiplier rules applied on quote spreads
- **Price Limits :** Price limits rules applied. If enabled, normal, wide and widest mode precised
- **Trading Period :** Defines the different periods within a trading day
- **Order Entry Qualifier:** Describes whether order entry is allowed for the instrument, and depends on Book State, Trading Mode and global availability
- **Trading Side : Not Applicable** (Specific field for Cash Warrants Markets)

The possible Market Status values on Euronext Derivatives are as follows:

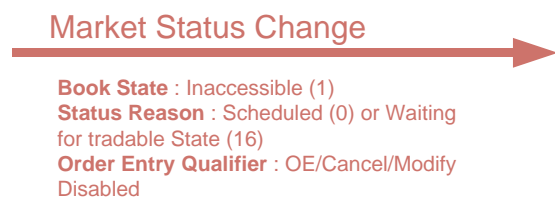


One of the main improvements of this message is that it provides the full state of the instrument or contract. The updated values will appear accordingly in the updated fields, with the unchanged values from the previous state persisted. Using this method, no interpretation is needed as all required information is provided each time the message is sent.

The **Trading Mode** is a byte-field (little endian) combinatory field.

Note that all fields are always populated, except the Scheduled Event and Scheduled Event Time, as they are notifications.

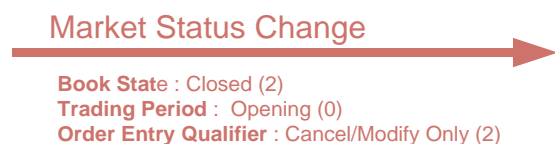
In the following kinematics charts, as an example a change of market status is described as follows:



If a message is sent to notify the removal of an active **Trading Mode**, it will be presented as follows:



As this field is a byte-field, the corresponding byte is set to 0. For the purpose of this document, this value will always be set to '1' (ie, Wholesale is allowed)

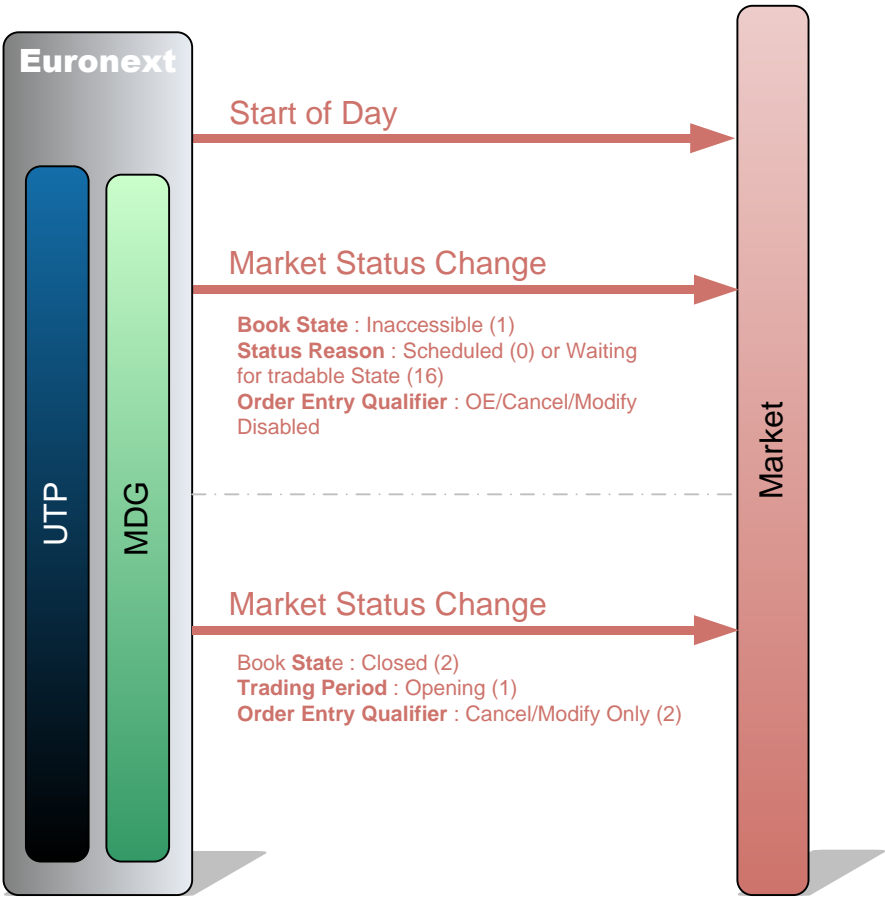


That means that the first byte is set to 1, other bytes of subset 1 are set to 0, and other subset values are not impacted.

8.1 START OF A TRADING DAY

Following the start of day message, a first Market Status Change message is sent to initiate the contract status. Its availability is denoted by the **Status Reason** of this first message. If it is set to Waiting for Tradable State, it means that the contract is not available.

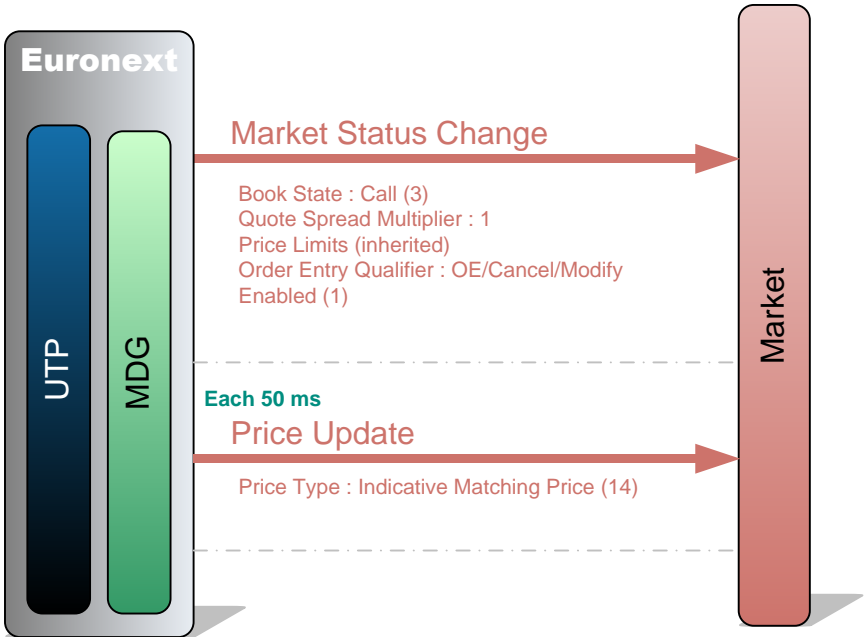
A second message is sent at the end of initialization phase for all available contracts, after which connections are allowed to the market. The Contract switches to a Closed State, in which GTC orders can be Cancelled/Modified. In this case, the Status Reason is not changed, so the Change Type does not mention it. However, the previous value is persisted in the message.



8.2 PRE-OPENING – CALL PHASE

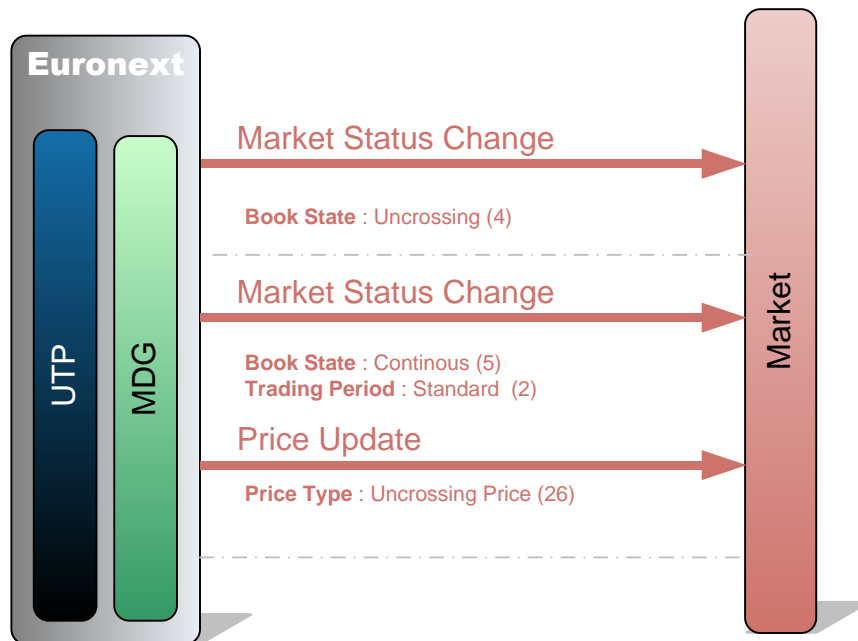
The following chart describes the data publication during a pre-opening phase. It includes Indicative Matching Price publication through the MDG Price Update message.

At the beginning of the trading day, the Quote Spread Multiplier mode is set at 1 by default, while Price limits setting is inherited from the previous trading day.



8.3 OPENING – UNCROSSING PHASE

The uncrossing message sequence is described by the following chart:

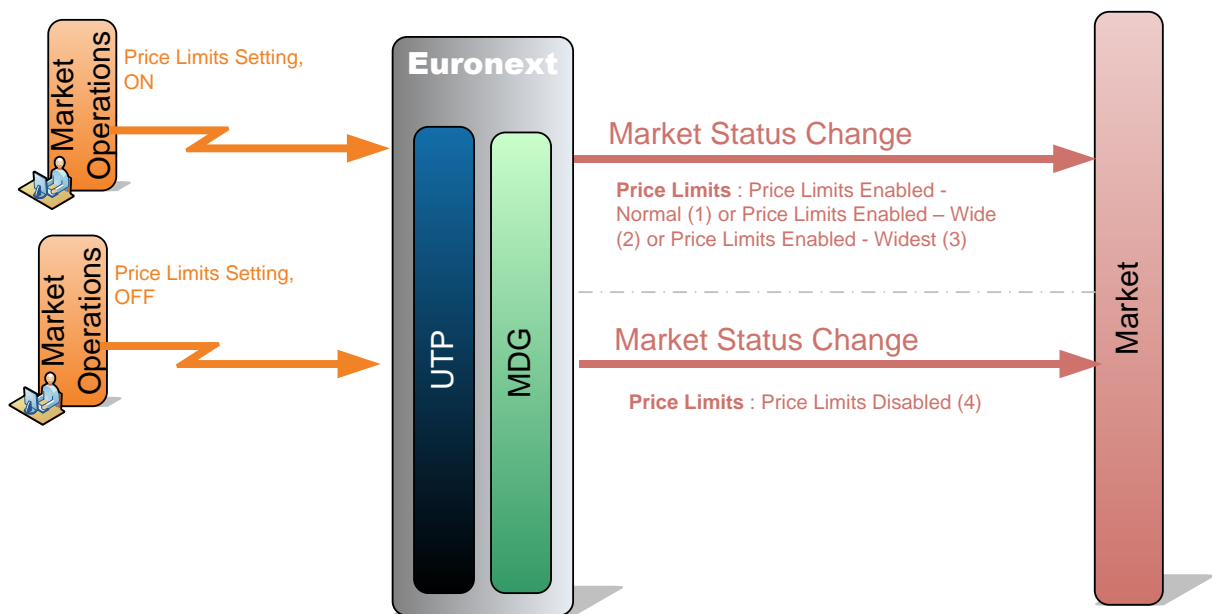


8.4 COMMON - CONTINUOUS PHASE

For both the Call (currently named pre-Open) or the continuous (currently Open) phases, the market status of a contract may change due to market operations, when it comes to Price Limits enabling / Quote Spread Multiplier Setting.

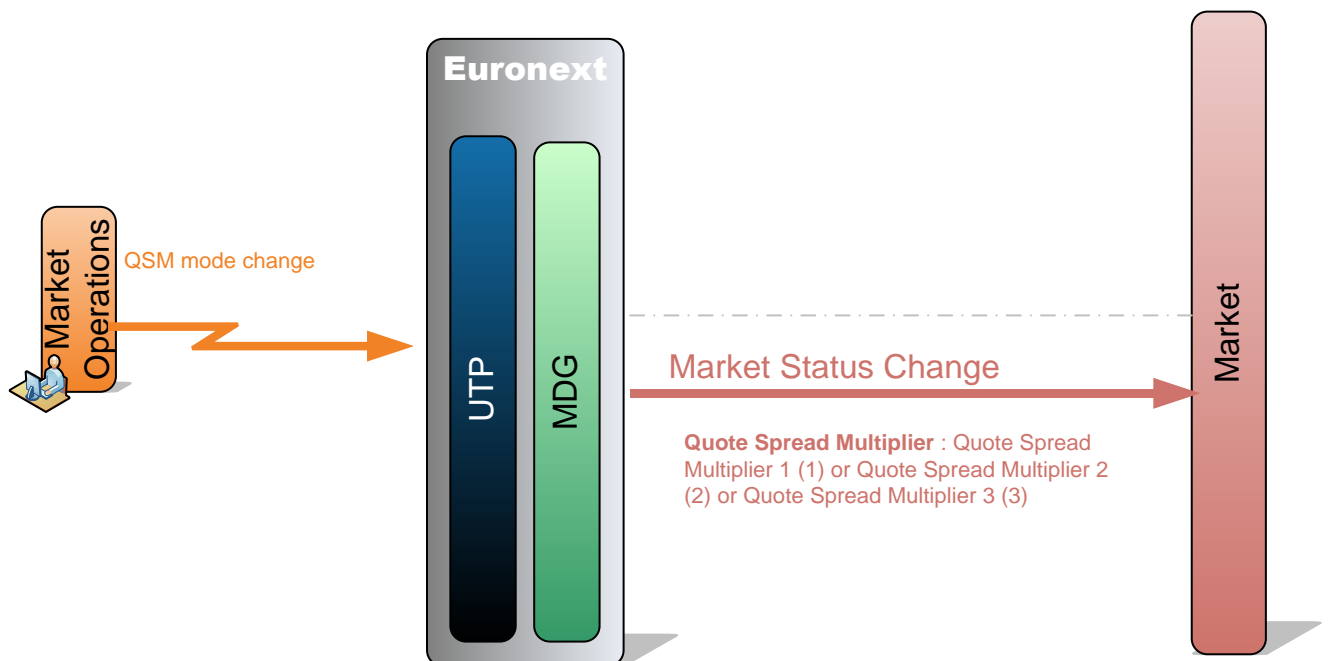
8.4.1 Price limits Management

During a call or a continuous phase, when Market Operations enables or disables the Price Limits, it impacts the contract's Market Status .



8.4.2 Quote spread multiplier management

The following chart describes the market data published each time Market Operations changes the Quote Spread Multiplier mode:



8.5 INSTRUMENT SUSPENSION & REACTIVATION (UNSUSPEND)

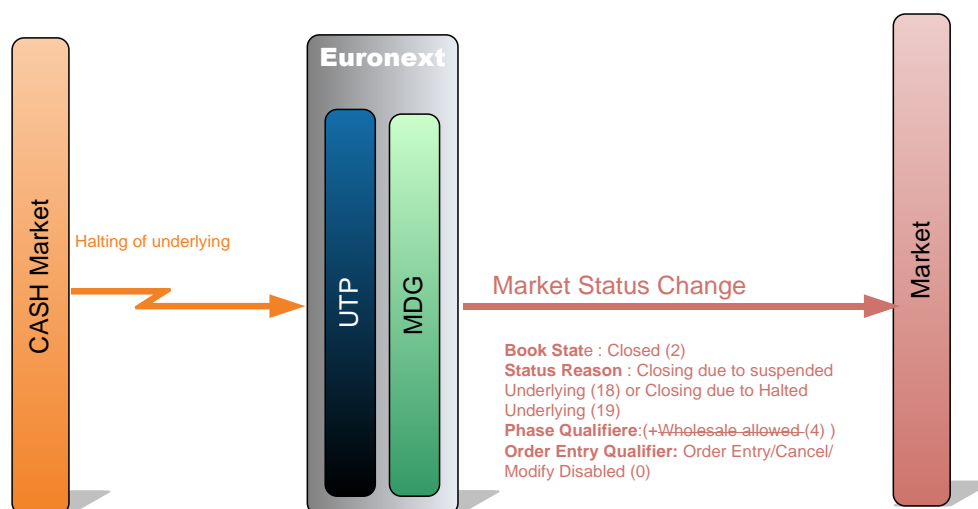
The suspension of an instrument may be due to:

- Suspension of the underlying
- Halting of the underlying (collars breached)
- Manual suspension of the contract (market operations)

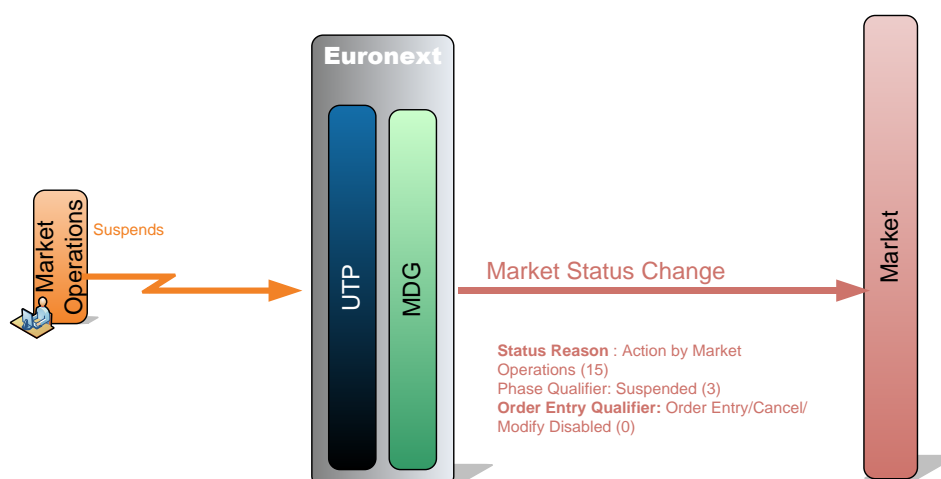
The message sequence generated is as follows:

8.5.1 Closing/Suspension of an instrument

In case of a suspension, trading is not allowed on the instrument, and all active day orders are pulled. The two charts below describe the messages sent in case of a suspension, when it is due to an event on the underlying or an action by Euronext Market Operations:



If the closing is due to a suspension of the underlying, and if wholesales were allowed at the time of the suspension on the contract in question, then they are no longer allowed *after* the suspension. All day orders are pulled.



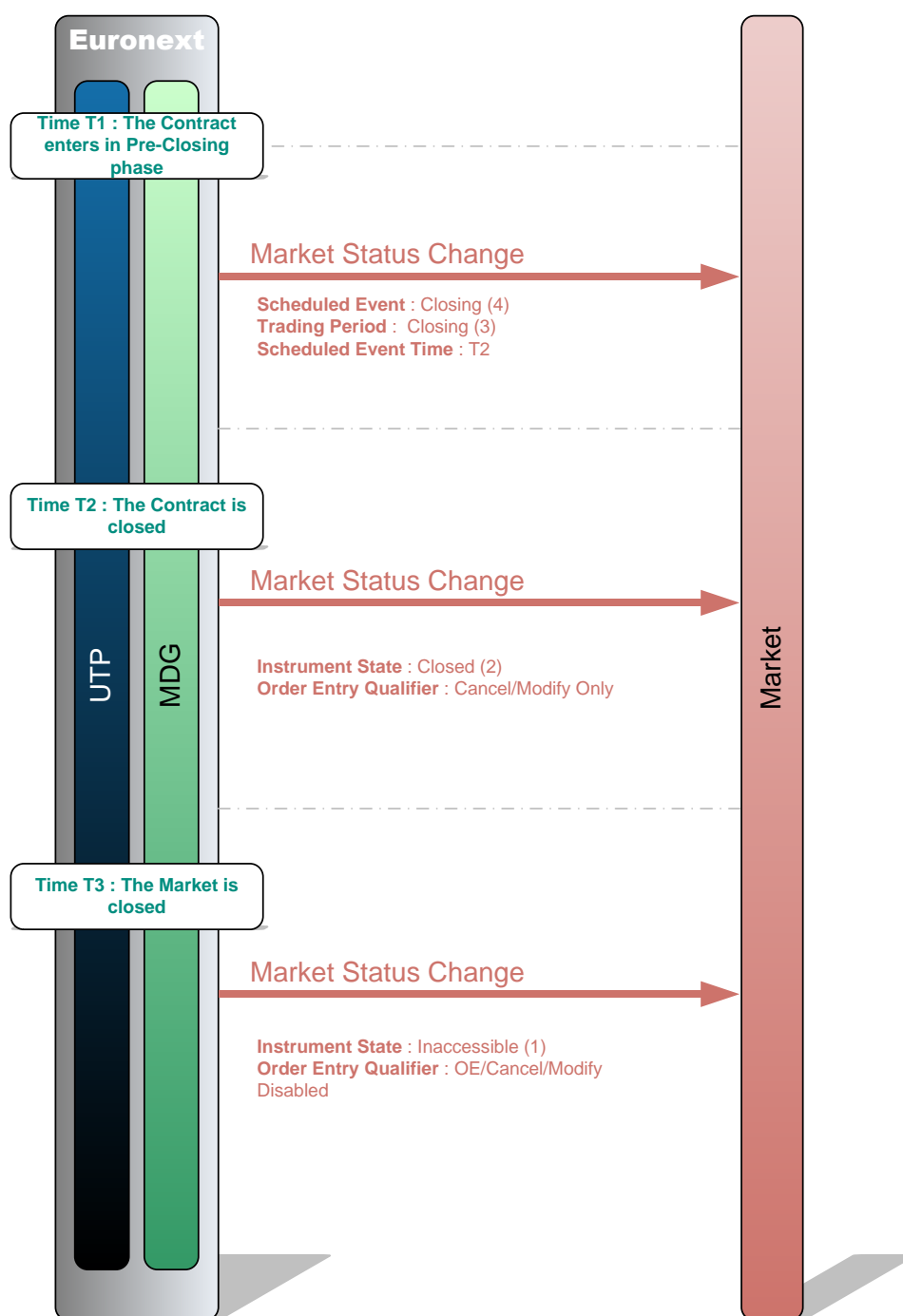
In the case of a suspension by Market Operations, all day orders are pulled, not only active day orders.

8.5.2 Reactivation (unsuspend) of an instrument

- When a closed instrument's reopening is triggered by a Market Operations Action, the contract or instrument goes through the same Pre-Opening phase as in the morning (see §8.2 and 8.3). The only difference is the Status Reason published in the first message: in this case it is set to 'Action by Market Operations'. This value remains until the schedule has reached its contract's scheduled pattern, and then switches to the 'Scheduled' value.
- When a suspended instrument is reactivated, following a suspension, the instrument returns to its predefined scheduled pattern.

8.6 PRE-CLOSING, CLOSING AND END OF A TRADING DAY

During the pre-close phase, a contract's market status is not impacted since trading still follows the same rules as described in the previous market status publication. Nevertheless, when entering into the pre-close phase, a notification is sent to the market through a Scheduled Event, with a Scheduled Time set to the Central Order Book closing time.



8.7 WHOLESALE TRADING SPECIFICS

This section describes the specific features applicable to wholesale trades.

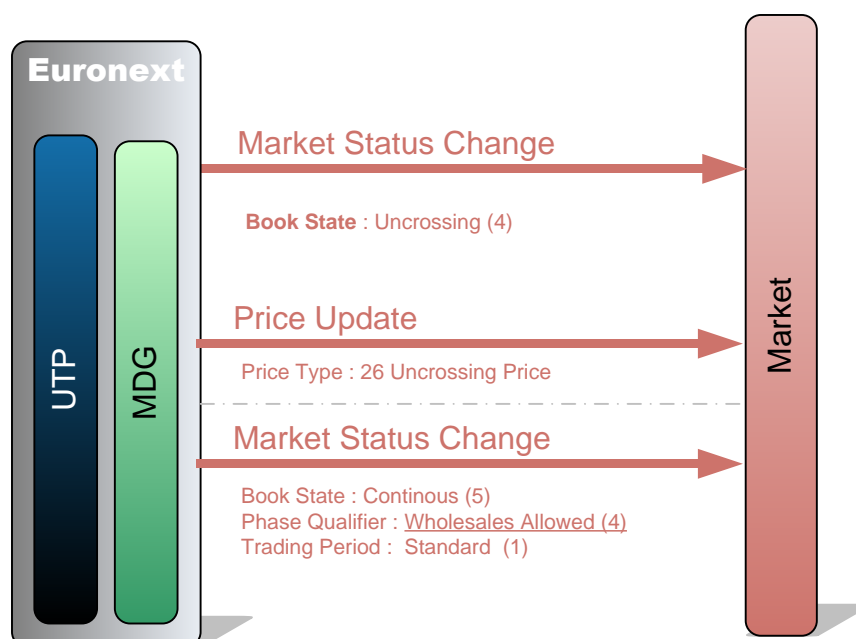
The following sections describe:

- Wholesale availability as a general feature
- Wholesale extended hours that start before the COB opening
- Wholesale extended hours that end during COB open hours
- Wholesale extended hours that end after the COB closing

8.7.1 Wholesale trading availability

During a trading day, the wholesale availability is always notified to the market through the appropriate value in the Trading Mode field

For instance, if wholesales are enabled as soon as the COB opens, then it will be reflected as follows in the opening phase (same chart as in 8.3 paragraph):



8.7.2 Wholesale extended hours out of COB opening

If the start of the Wholesale extended hours is scheduled before the COB opening time or its end is scheduled after the COB closing time, the Wholesales extended hours notification are sent:

- After the contract Closing time: the end time is provided alongside the closing notification, specifying the Wholesale Type.
- Before contract Opening time: the start time is provided alongside the switch from Inaccessible phase to Close phase at the beginning of the trading day.

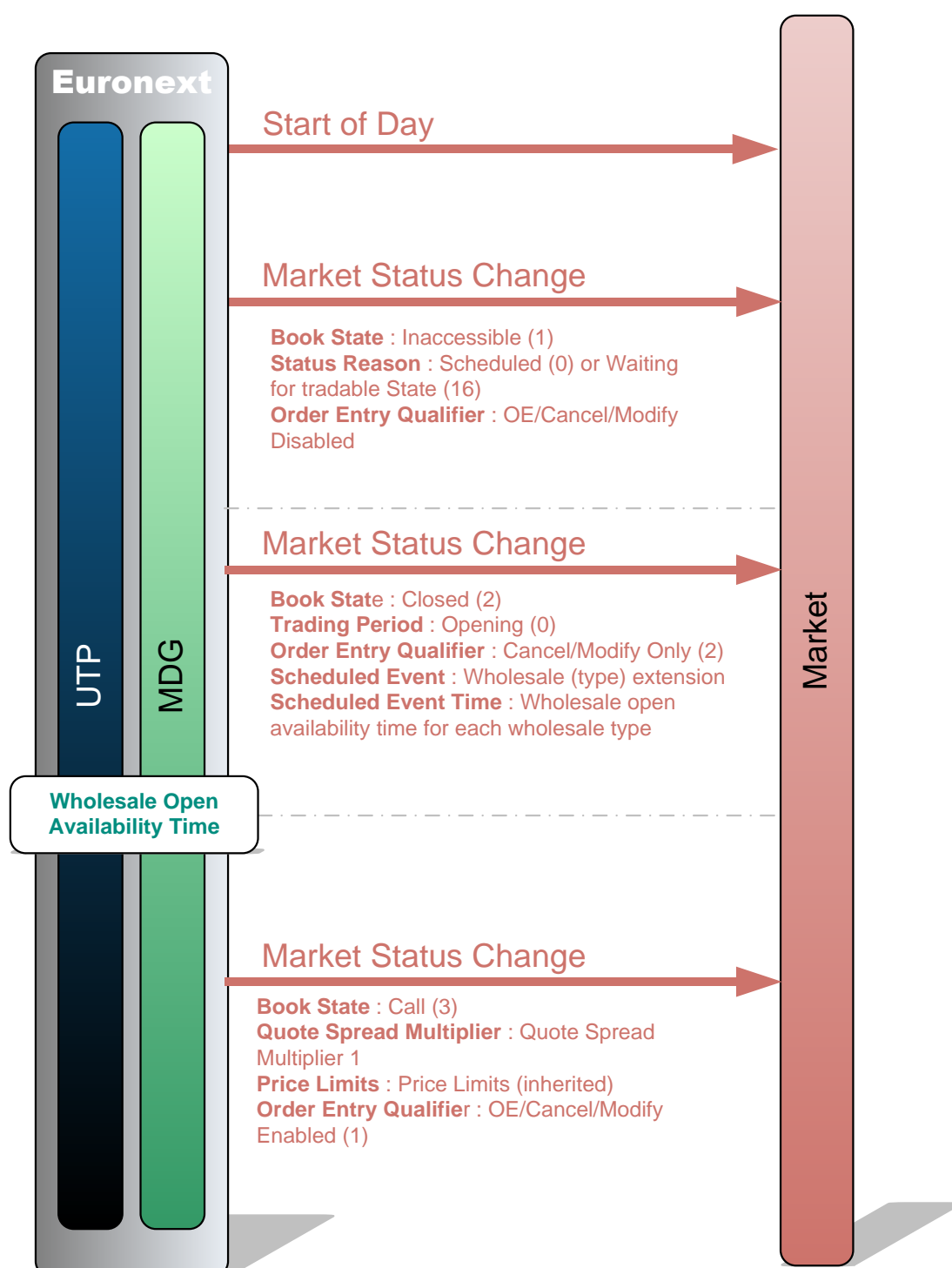
As a global principle, readers should note the following:

- Wholesale extended hours are communicated to the market through Scheduled Events and associated Scheduled Event Times
- Scheduled Events corresponding to extended hours are set according to the Wholesale type (below). However, there is a generic Scheduled event type to send a notification impacting all Wholesale types. If a scheduled event is sent with the generic Scheduled event value, and another event value is sent after with a *specific* type, then it means that all extensions apply, except for the

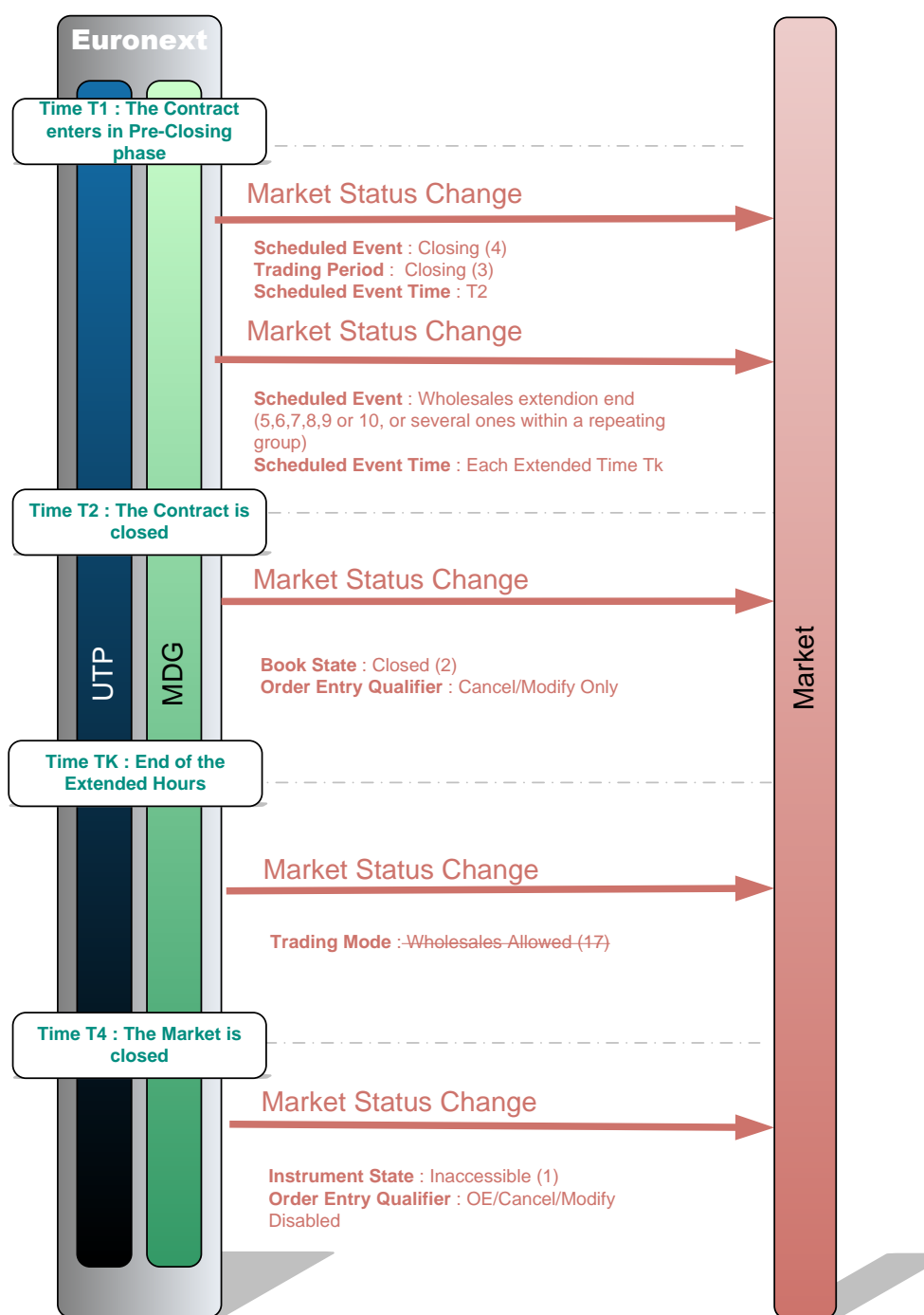
specific type communicated, in which case the specific type follows its own extended hours. The Wholesale Extension types are the following:

- Wholesale Large in Scale (LiS) trades open extension
- Wholesale Basis trades open extension
- Wholesale Guaranteed Cross
- Wholesale Against Actuals trades open extension
- Wholesale Large in Scale (LiS) Package trades open extension
- Wholesale Exchange For Swaps trades open extension
- Wholesale trades open extension

The following chart describes the message sequence sent if Wholesales are enabled before the opening or after the closing of the Central Order Book.

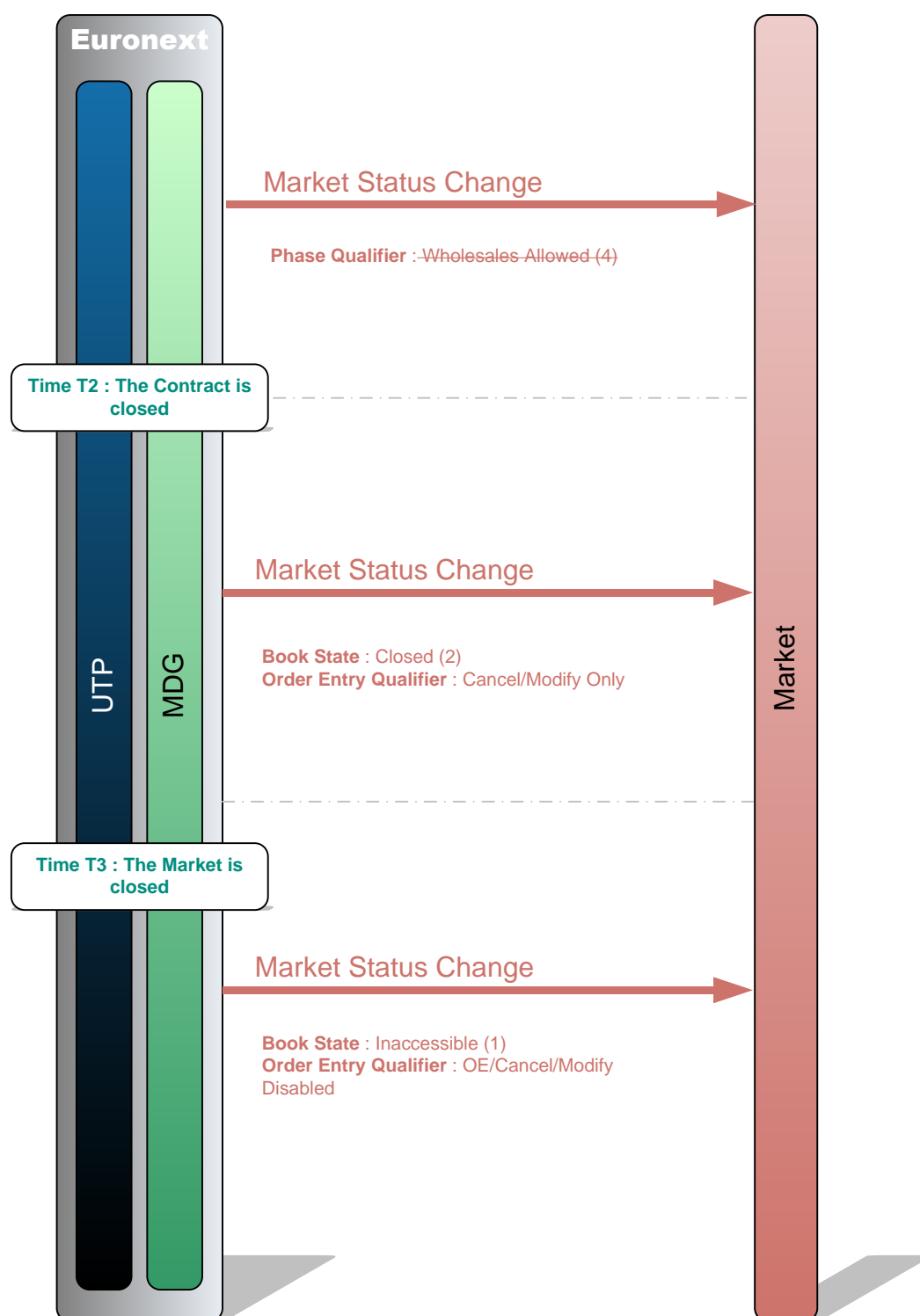


The following chart describes the Market Data messages sent in case of Wholesale extension after COB closing time.



8.7.3 Wholesale extended hours within COB open time window

If the end of the Wholesale extended hours is scheduled within the COB open time window, the market notification through Scheduled Event is sent at end time, without a relevant scheduled time, and the COB Trading Mode is set accordingly, which is described as follows:

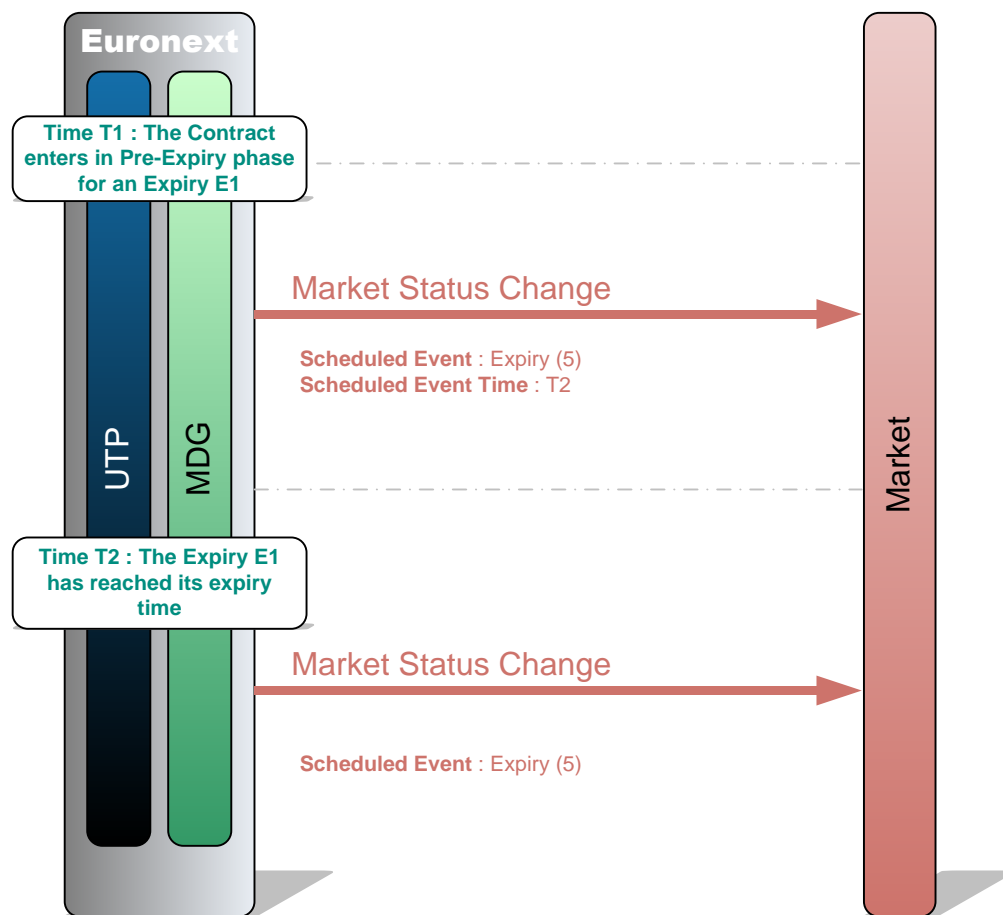


8.8 PRE-EXPIRY AND EXPIRY

This section describes the market notification of an expiry.

Whenever a contract enters in a pre-expiry phase, regardless of the maturity, a notification is sent to the market through a scheduled event. The contract's market status is not affected, since the whole contract is still available.. The identification of the impacted expiries may be done according to the instrument's

maturity dates and the current date. A second notification is sent to the market at contract level when reaching expiry time, as described in the following chart:



8.9 STRATEGIES: INTER-CONTRACT SPREADS

This section is dedicated to the ICS, which have special features as they involve different contracts.

As a general rule, all strategies follow the contract on which they are defined in terms of schedule parameters: Book State, Trading Mode, and Events. The only exception is the ICS.

There are two types of ICS:

- ICS attached to one of the involved contracts.
- ICS defined on a specific synthetic contract.

The strategy follows the contract rules below for :

- Quote Spread Multipliers
- Price Limits modes

As such, no specific message will be published at strategy level if one of those two values change.

ICS's are particular in that they are cross contract instruments, which have their own specific messages sent at the instrument level. It should be noted that an ICS cannot be opened unless all contracts on which its legs are defined are also open.

There is a similar behaviour when it comes to certain trading modes. For example, the expiry of an ICS instrument is triggered by the expiry of any of its legs. As such, additional messages are sent on ICS instruments for the following settings :

- Trading Mode : Suspended
- Trading Mode : Expired

Additionally, the rule followed by an ICS contract in terms of pattern is the following :

An ICS Strategy can only be opened if all related contracts are opened.

During the opening, as soon as the contracts are in the same phase, the strategy follows and a 1005 Market Status Change message is sent to notify the market at ICS contract level.

During the closing, as soon as one of the contract enters in a closing phase, the Strategy follows. The Scheduled Event for the closing is sent through a 1005 MDG message, and the associated hour will be the first closing hour of the related contracts' closing hours.

The Trading Periods *Standard Opening*, *Standard Core* and *Standard Closing* follow this synthetic pattern defined on each related contract pattern by this rule.

8.10 SESSION MANAGEMENT

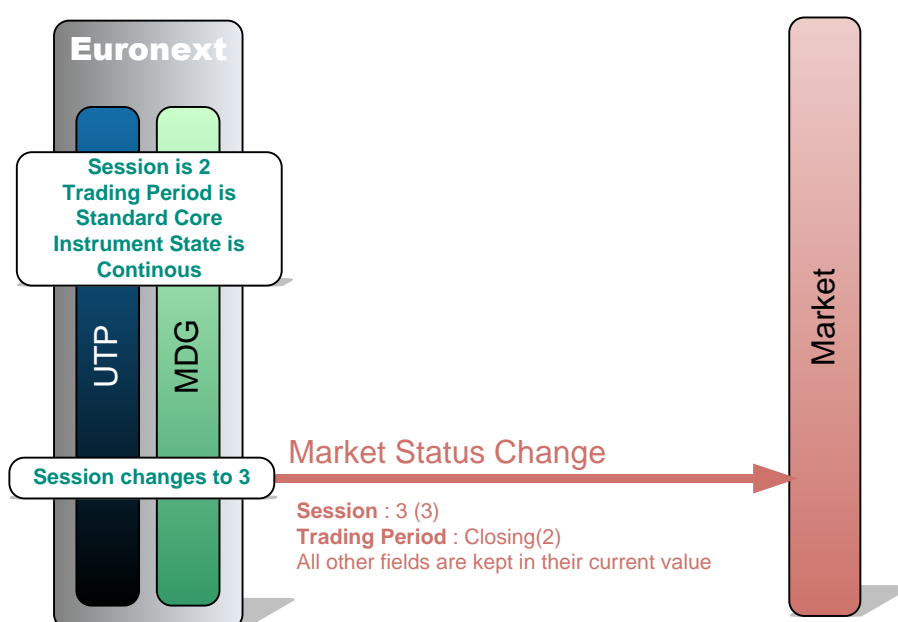
Three trading sessions are defined on the derivatives markets during a trading day.

During the first session (Session 0 – Null Value disseminated), the market is technically not accessible, which means that no trade can be cleared.

During the second session (Session 2), all trades recorded will be cleared during the trading day.

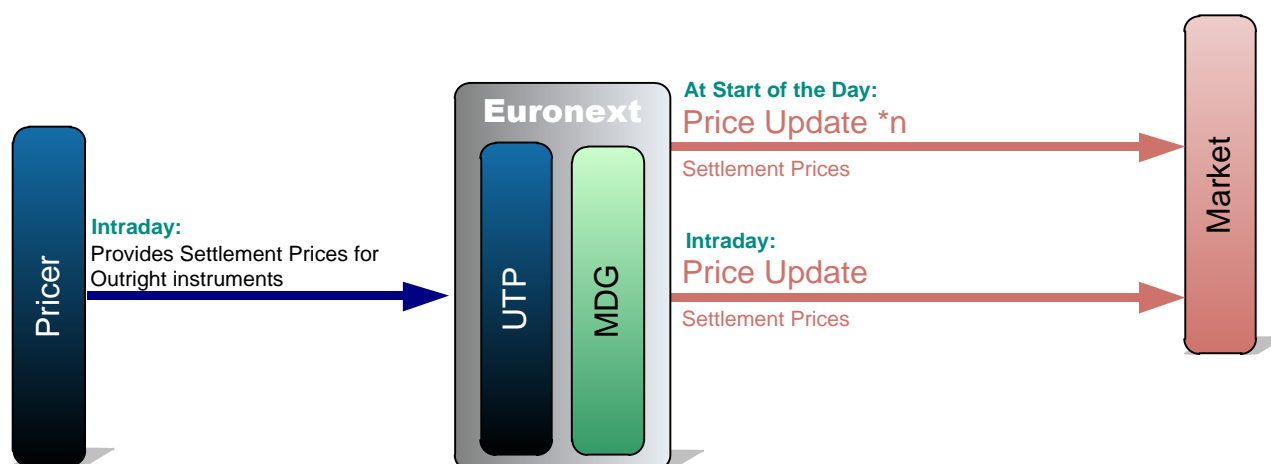
All trades occurring during the third session (Session 3) are to be cleared on the next trading day.

The switch between the first and the second occurs when entering the Standard Opening Trading Period. The switch between the second and the third session will be broadcasted intraday through a dedicated Market Status Change message. It also triggers a change of Trading Period (Late values). The following example describes a change of Session while the contract is open (Book State = Continuous) :



9. REFERENTIAL KINEMATICS

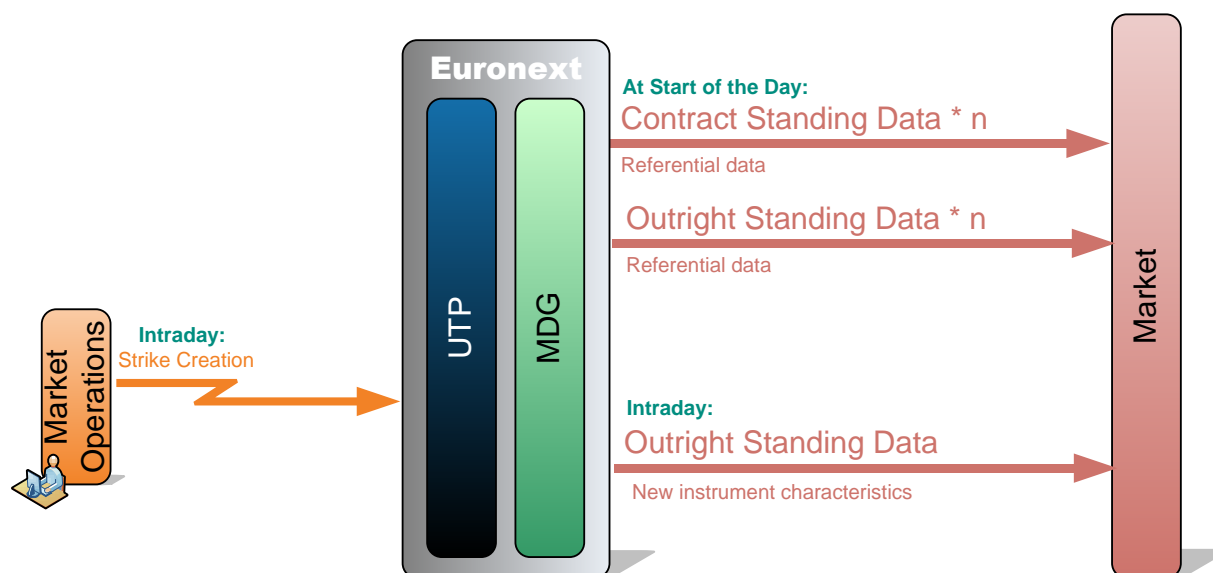
9.1 SETTLEMENT PRICES



The Price Update provides settlement prices for outright instruments.

This message can be transmitted any time during Market Trading or Session End. It gives the official settlement and closing prices for outright products, but also intraday updates as needed.

9.2 OUTRIGHT & STRATEGIES INSTRUMENTS



Outright Standing Data messages are sent to the Market:

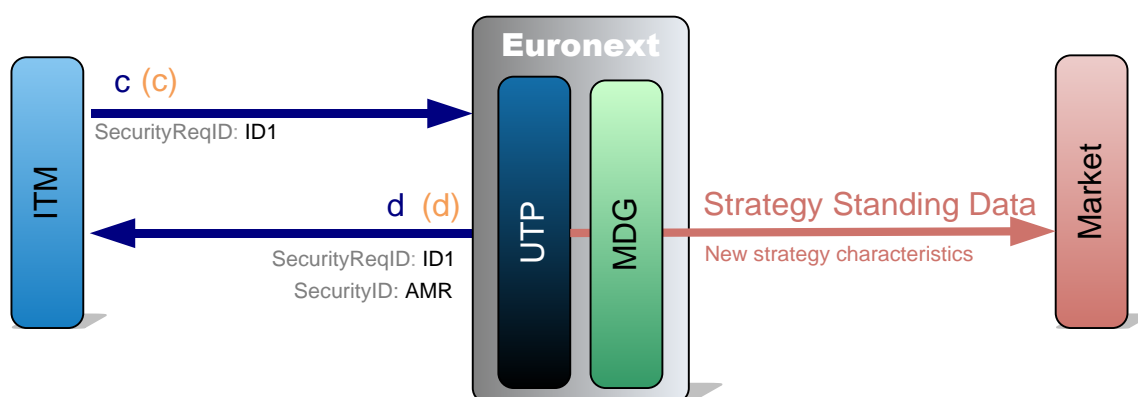
- at the start of the day
- when there is an intraday change (only for strike creation) to the list of outright instruments available for a specific contract

One Outright Standing Data is sent per created outright (option) instrument.

Note: Once created in UTP-D, the outright instrument becomes tradable the same trading day according to the market status of the contract.

9.3 STRATEGY CREATION

9.3.1 Security Definition Request Accepted



Traders can create a new strategy definition by sending a Security Definition Request.

If the security definition request is accepted then the Exchange responds with a **Security Definition (d)**

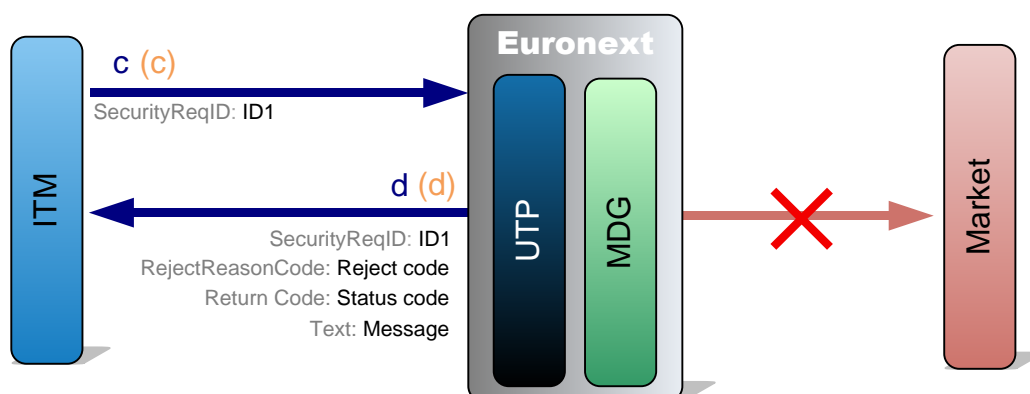
The SecurityReqID contains the client's security definition request ID.

The Security ID contains the Euronext Code of the new instrument.

Participants are notified of the newly-created strategy via a public MDG Strategy Standing Data message.

Note: Once the strategy has been created in UTP-D, it becomes tradable the same trading day according to the market status of the contract.

9.3.2 Security Definition Request Rejected



If the security definition request is rejected then the Exchange responds with a **Security Definition (d)**

The RejectReasonCode contains a code for the rejection reason. If the RejectReasonCode is set to 'Other', the status code is given in the ReturnCode.

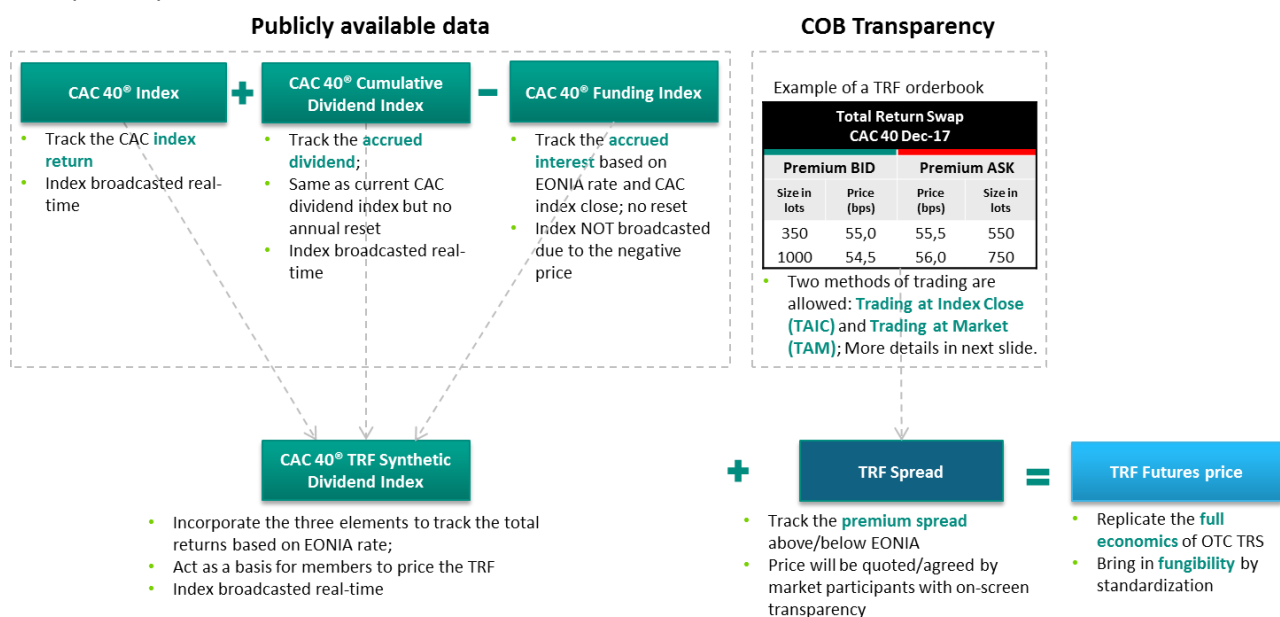
10. TOTAL RETURN FUTURES KINEMATICS

10.1 PRODUCT DETAILS

Euronext's **Total Return Future (TRF)** on the CAC 40® Index is a listed contract which replicates the economics of a total return swap and offers investors a listed solution to access implied equity repo. This new future offers multiple advantages to market participants:

- Positive impact on capital requirements: the Total Return Future on CAC 40 is an answer to the increased capital requirements when trading OTC transactions
- Strong margin offsets when trading Euronext futures: investors trading the Total Return Future on CAC 40 will benefit from margin efficiencies
- Transparency and accessibility: thanks to a centralised order book and central clearing, new investors will be able to access the implied repo market.

The basic economics of a TRF contract include 4 elements, where the Synthetic Dividend Index price is publicly available and the TRF Spread will be quoted/agreed by market participants with on-screen transparency.:



The following indices are made dedicated for CAC TRF trading:

Index name	Isincode	Mnemo	Bloomberg Code	Reuters code	Base date	Base value	Publication since
CAC 40® Synthetic Dividend	FR0013252418	C4SD	C4SD	.C4SD	19-12-16	4822,77	19-05-17
CAC 40® Funding		C4FU			01-10-18	0	Not broadcasted
CAC 40® Cumulative Dividend	FR0013252392	C4CD	C4CD	.C4CD	19-12-16	0	19-05-17

More information about these indices, please refer to the [“CAC 40 Synthetic Dividend Index Index Rule Book”](#) document.

10.2 TRADING MECHANISMS

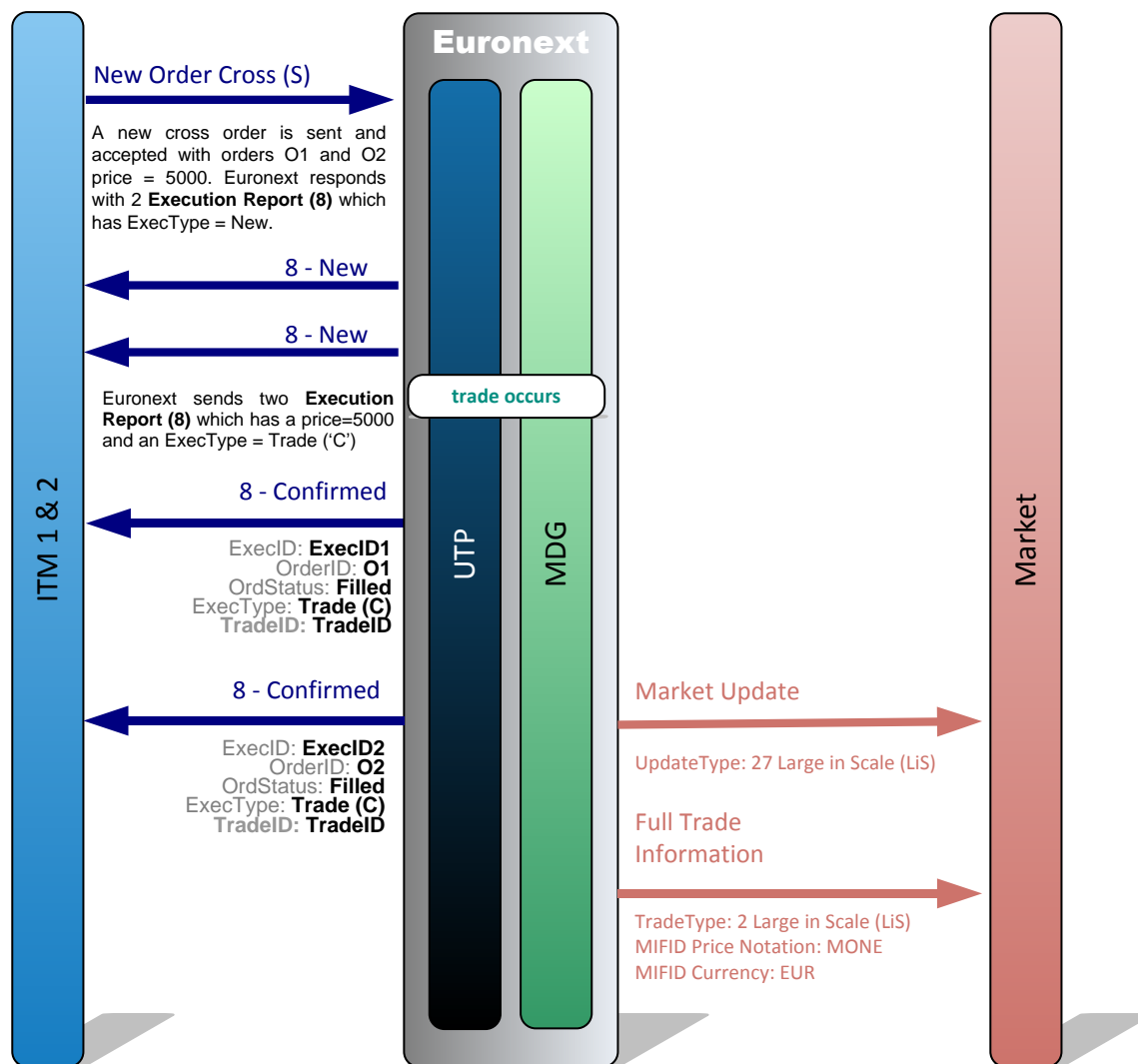
Total Return Futures contracts allow two kinds of trading mechanisms depending on the chosen trade type.

	A. Trading At Index Close (TAIC)	B. Trading At Market (TAM)
Trading facility	Via Central Order Book & Wholesale Facilities	Via Wholesale Facilities only
Order entry	TRF Spread in bps, e.g. 50 bps	TRF Futures price in index points, e.g. 4,900 points
Trade price	Final futures price is known at the end of the day (when the index close is known)	Final futures price is known at the time of trading

10.2.1 Trade At Market (TAM)

TAM is a type of quotation only usable with wholesale Large in Scale. The trade is entered directly with a final price in clearing notation (index points).

This command type allows members to submit the definitive price for a TRF. The price submitted in clearing notation must be checked against boundaries of central order book. Central order book is in trading notation (basis points), then the price of TAM must be converted in Traded TRF spread.



In Full Trade Information (1004) message the prices are sent in **Index Point**, while in Market Update (1001) message the prices are sent in **Basis Point**¹.

Full Trade Info

Trade Type = {'Large in Scale (LiS) Trade', 'Large in Scale (LiS) Package Trade', 'Strategy Leg Large in Scale (LiS) Trade'}

MIFID Price Notation = 'MONE'

MIFID Currency = 'EUR'

MMT Trading Mode = 'Trade Reporting (Off exchange)'

MMT Market Mechanism = 'Off Book (including Voice or Messaging Trading)'

Market Update

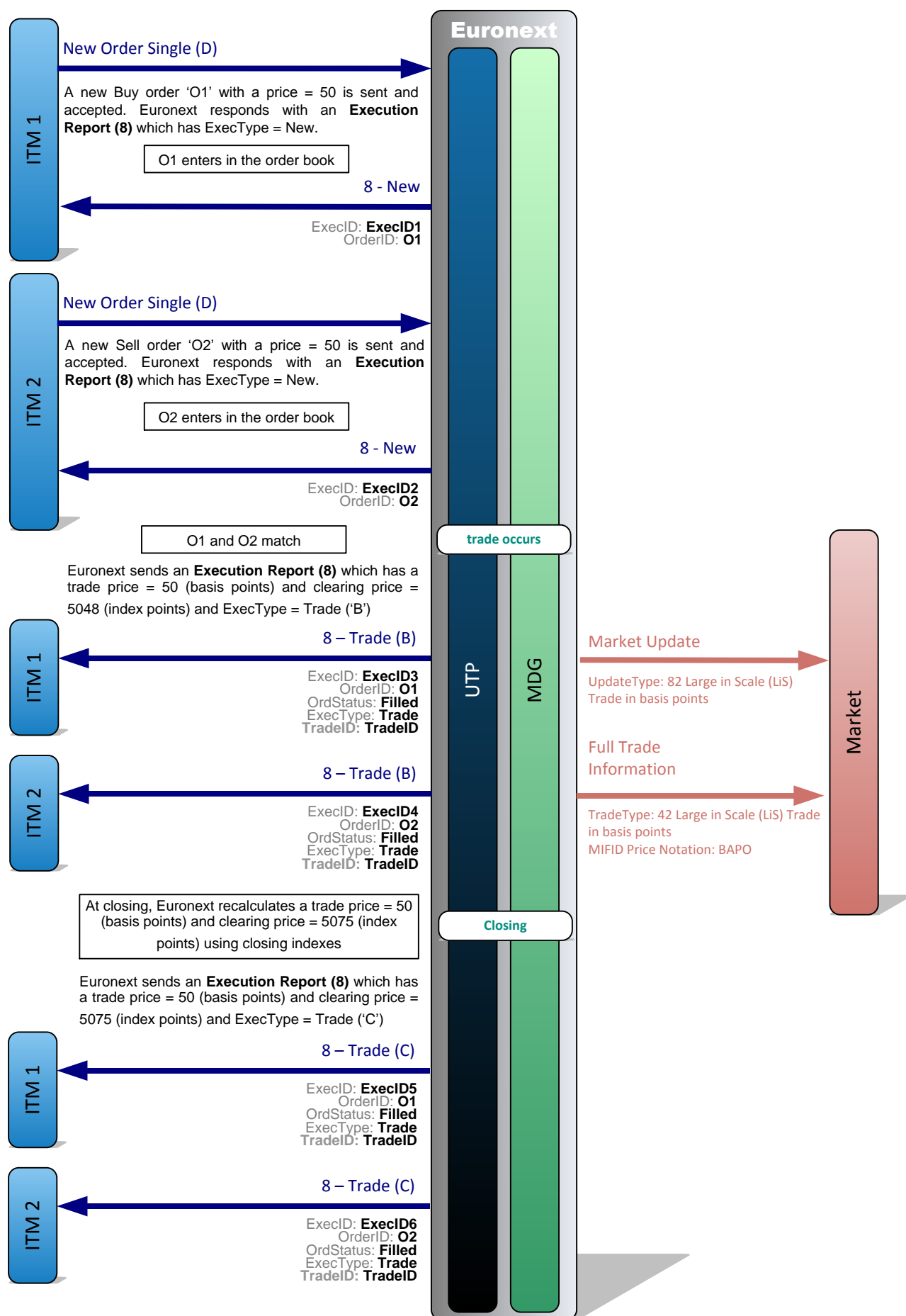
Market Update Data Type = {'Large in Scale (LiS) Trade', 'Large in Scale (LiS) Package Trade', 'Strategy Leg Large in Scale (LiS) Trade'}

¹ The price in Basis Point is calculated based on the executed TAM clearing price, spot CAC 40 Index at the time of the trading and accrued funding/distribution of the day.

10.2.2 Trade At Index Close (TAIC)

TAIC is the type of quotation used for the Central Order Book. The handling of Total Return Futures order entry, execution prices is based on the TRF Spread, expressed in trading notation as a relative (positive, negative or zero) annualized interest rate applied to the Funding Rate. A final price in clearing notation for the trades executed during intraday will be computed once the final Index Close is validated.

This type of quotation will be used also with wholesale.



In Full Trade Information (1004) and Market Update (1001) messages the prices are sent in **Basis Point**.

Large in scale trades have new dedicated types to differentiate with TAM trades.

Full Trade Info

Trade Type = {'Large in Scale (LiS) Trade in basis points', 'Large in Scale (LiS) Package Trade in basis points', 'Strategy Leg Large in Scale (LiS) Trade in basis points', 'Conventional Trade', 'Basis Trade', ...}

MIFID Price Notation = 'BAPO'

MIFID Currency = ''

MMT Trading Mode = 'Trade Reporting (Off exchange)'

MMT Market Mechanism = 'Off Book (including Voice or Messaging Trading)' for Wholesales

MMT Market Mechanism = 'Central Limit Order Book' for others

Market Update

Market Update Data Type = {'Large in Scale (LiS) Trade', 'Large in Scale (LiS) Package Trade', 'Strategy Leg Large in Scale (LiS) Trade', 'Conventional Trade', 'Basis Trade', ...}

10.2.3 Central Order Book

TRF Book is in basis points. The following Order Price Types are supported for TRF contracts:

- Immediate Or Cancel
- Good till Cancelled
- Good till Date
- Day
- Minimum Quantity
- Limit
- Market
- Market on Open
- Good in Session

TRF contract has the Quarterly expiry in the Mar, Jun, Sep, Dec cycle up to 5 years and 3 months (21 maturities).

For TAIC order in the Central Order , Market participants will bid/ask in basis points, with a tick size of 0.5 bps.

Similar to the index futures contract, a Daily Settlement Price will be calculated each day to incorporate the daily accrued dividend, daily accrued funding and daily settlement TRF spread.

10.2.4 Price Update message for TRF

For each maturity of the Total Return Futures, the Price Update (1003) message with Market Data Price Type = 7 - Provisional Intraday (Derivatives Only) Settlement Price messages are being sent out. These Provisional Intraday Settlement messages are sent out as part of MDG Set of Channels 26 = Equity and Index Futures France and sent out for Total Return Futures.

The price update can be triggered by either a trade on the TRF contract or by the underlying price change.

The messages are sent with a 15 second interval between 09:00 and 17:30 CET or whenever a trade occurs.

APPENDIX A: DOCUMENT HISTORY

DOCUMENT HISTORY

REVISION NO./ VERSION NO.	DATE	CHANGE DESCRIPTION
1.0.0	12/07/2016	First Official Release
1.0.1	29/07/2016	Standing Data Message replaced by both Contract Standing Data and Outright Standing Data messages Impacted sections : 1.4 1.5 9
1.1.0	06/09/2016	Modification of section 8 following the change on the Market Status Change message Addition of section 8.10 to clarify clearing session management
1.2.0	12/12/2016	Updates on sections 8.10 : details provided on Trading Period for late trading Updates on section 8.7.2 : scheduled events for wholesales availability before COB opening are sent when entering the first closed state of the trading day. Update on section 2.5 : clarification of the trade Notification and Cancellation with the explicit mention of the Market Update sent
1.4.2	13/07/2017	In Section: IOP, the kinematics has been corrected. For the Market Update with 2 repeated sections values of Market Data Update Type were not correct
1.5.0	31/07/2018	Adding section 10 to describe the specifics on Total Return Futures contracts.
1.5.1	15/03/2018	Modification on sections 10.2.1 Addition of section 10.2.4