NGM Market Model

Version 1.13.4 - 2025-09-03

Contents

1. Introduction

This document describes the trading functionalities at Nordic Growth Market (NGM).

While the Member Rules [RULES] are legally binding documents, this document serves to give additional and comprehensive information of the trading functionality that might not be covered in other documents. Furthermore, where the NGM FIX Protocol [FIX] contains technical details e.g. the fields of an order at a technical level, this document describes similar information in a non-technical way.

Section 2, “Market Overview” gives an overview of the market, the market segments and the clearing and settlement. Section 3, “Trading Phases” and Section 4, “Trading Sub-States” describes the trading phases and sub-states throughout the day. Order types and quote functionality is described in Section 5, “Orders” and Section 6, “Quotes”, respectively. Section 7, “Matching” describes the matching rules. The process of manual trade reporting is detailed in Section 8.1, “Manual Trades”.

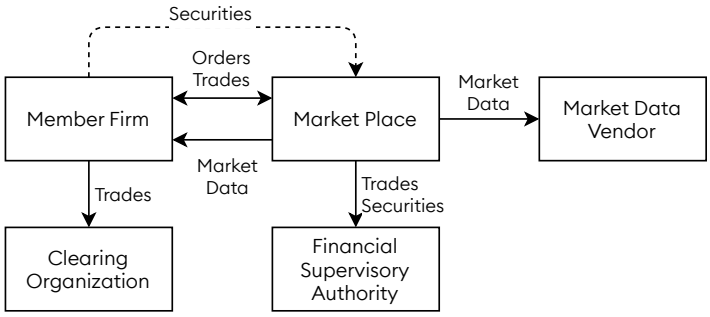
Documents referenced in this document can be found at NGM’s official web or NGM’s Elasticia web.

2. Market Overview

Trading at NGM is conducted in the Elasticia ® exchange trading system.

Trading in the Elasticia system is fully electronic and automatic. Participation in trading is allowed for members of NGM. The figure below shows an overview of the market participants. Member firms may send orders, quotes and manual trades to the exchange. The exchange will publish relevant changes in the market data feed, which is disseminated to member firms and market data vendors. It is the responsibility of each member firm to forward trade details to the relevant clearing organization for clearing and settlement.

For information about network connectivity, see Network Connectivity in Elasticia [NETWORK].



Members are identified by their member code of 3-5 upper case alphanumeric characters.

2.1. Securities

In this document the terms *security*, *order book*, and *instrument* are used interchangeably, meaning that a security corresponds to exactly one order book. For example if a financial instrument is traded in multiple currencies then this would be represented as multiple securities in the NGM trading system. Each security can be uniquely identified by any of the following combinations. The Security ID is the primary identifier.

- Security ID (a.k.a. Order book ID)
- ISIN + Market Segment + Currency + active period
- Symbol + Market Segment + Currency + active period

Active period means that an instrument can be listed, delisted and then listed again and have the same identification as in the previous listing, although SecurityID may be different.

2.2. Market Structure

Securities are grouped into a hierarchical structure of market segments. Each market segment is identified by the Market ID (ISO 10383 MIC) together with the Segment ID.

Note that the trading details, e.g. tick rules, round lot size, traded currency and instrument type, are specified on at the market segments level and then (optionally) overridden at the security level. See the NGM FIX Protocol [FIX] and the NGM Instrument Schema [SCHEMA] for more information.

Table 1. Market structure Nordic Growth Market.

Name	Market ID	Segment ID
NGM Main Market	XNGM	MR
→ Main Market Equity	XNGM	NEST
→→ Equity Stockholm	XNGM	EQST
→ Nordic AIF	XNGM	MRAIF
→→ Nordic AIF Sweden	XNGM	AIFS
→→ Miscellaneous Nordic AIF Sweden	XNGM	AIFSM
→ Debt Securities Sweden	XNGM	DEBS
→→ Corporate Bonds SE	XNGM	CBOS
→→ Miscellaneous Debt Securities SE	XNGM	MDSS
→ NDX Denmark	XNGM	NDXD
→→ Structured Products DK	XNGM	DDSP
→→ Miscellaneous Investment Products DK	XNGM	DDMP
→ NDX Finland	XNGM	NDXF
→→ Structured Products FI	XNGM	DFSP
→→ Miscellaneous Investment Products FI	XNGM	DFMP
→ NDX Norway	XNGM	NDXN
→→ Structured Products NO	XNGM	DNSP
→→ Miscellaneous Investment Products NO	XNGM	DNMP
→ NDX Sweden	XNGM	NDXS
→→ Structured Products SE	XNGM	DSSP
→→ Miscellaneous Investment Products SE	XNGM	DSMP
Nordic SME	NSME	NSME
→ Nordic SME Norway	NSME	NSNO
→ Nordic SME Sweden	NSME	NSSE
→ Nordic SME Finland	NSME	NSFI
→ NGM PepMarket	NSME	NSPSE
ETP	NMTF	ETP
→ ETP Denmark	NMTF	ETPD
→→ Certificates DK	NMTF	EDCE
→→ Exotics DK	NMTF	EDEX
→→ Knock-Outs DK	NMTF	EDKO
→→ Plain Vanillas DK	NMTF	EDPV
→ ETP Finland	NMTF	ETPF
→→ Certificates FI	NMTF	EFCE
→→ Exotics FI	NMTF	EFEX
→→ Knock-Outs FI	NMTF	EFKO
→→ Plain Vanillas FI	NMTF	EFPV
→ ETP Norway	NMTF	ETPN
→→ Certificates NO	NMTF	ENCE
→→ Exotics NO	NMTF	ENEX
→→ Knock-Outs NO	NMTF	ENKO
→→ Plain Vanillas NO	NMTF	ENPV
→ ETP Sweden	NMTF	ETPS
→→ Certificates SE	NMTF	ESCE
→→ Exotics SE	NMTF	ESEX
→→ Knock-Outs SE	NMTF	ESKO
→→ Plain Vanillas SE	NMTF	ESPV
Debt Securities Sweden MTF	NMTF	DSSM
→ Corporate Bonds SE MTF	NMTF	CBSM
→ Miscellaneous Debt Securities SE MTF	NMTF	MDSM
Investment Products MTF	NMTF	IPM
→ Investment Products MTF Sweden	NMTF	IPMS
→→ Structured Products MTF SE	NMTF	IPMSSP
→→ Miscellaneous Investment Products MTF SE	NMTF	IPMSMP

Name	Market ID	Segment ID
→ Investment Products MTF Finland	NMTF	IPMF
→→ Structured Products MTF FI	NMTF	IPMFSP
→→ Miscellaneous Investment Products MTF FI	NMTF	IPMFMP
→ Investment Products MTF Denmark	NMTF	IPMD
→→ Structured Products MTF DK	NMTF	IPMDSP
→→ Miscellaneous Investment Products MTF DK	NMTF	IPMDMP
→ Investment Products MTF Norway	NMTF	IPMN
→→ Structured Products MTF NO	NMTF	IPMNSP
→→ Miscellaneous Investment Products MTF NO	NMTF	IPMNMP

Throughout this document, the market segment categories *Equity*, *ETP* and *Other* are used. The *ETP* category applies to the ETP segment, including all sub-segments. The following segments (including sub-segments) are categorized as *Equity* segments:

- Main Market Equity
- Nordic AIF
- Nordic SME

2.3. Clearing and Settlement

Membership at NGM requires participation directly or indirectly in clearing and settlement systems where the securities traded by the member are cleared and settled. The following table shows the currently applicable clearing organizations.

Table 2. Clearing organizations.

Clearing Organization	BIC
Euroclear Sweden AB	VPCSSESSXXX
Euroclear Finland Oy	APKEFIHHXXX
Verdipapirsentralen ASA	VPSNNOKKXXX
Euroclear Bank S.A/N.V	MGTCBEBEECL
VP Securities AS	VPDKDKKKXXX

The table does not prevent members from choosing a system for the settlement of transactions undertaken on a regulated market on condition that:

1. the links between, and agreements concerning, the designated settlement system and any other system assure an efficient and economical settlement of the transaction; and

2. the Swedish Financial Supervisory Authority has not decided that the chosen settlement system may not be used for settlement of transactions on the regulated market.

The following table shows which clearing organizations that are used for each of the market segments. Note that information about which clearing organization that is used is present at the security level in the Central Securities Depository (CSD) field.

Table 3. Clearing organizations for each market segment.

Name	EC SE	EC FI	VPC NO	EC BE	VPS DK
NGM Main Market					
→ Main Market Equity					
→→ Equity Stockholm	x				
→ Nordic AIF					
→→ Nordic AIF Sweden	x				
→→ Miscellaneous Nordic AIF Sweden	x				
→ Debt Securities Sweden					
→→ Corporate Bonds SE	x				
→→ Miscellaneous Debt Securities SE	x				
→ NDX Denmark					
→→ Structured Products DK					x
→→ Miscellaneous Investment Products DK					x
→ NDX Finland					
→ Structured Products FI		x			
→ Miscellaneous Investment Products FI		x			
→ NDX Norway					
→→ Structured Products NO			x		
→→ Miscellaneous Investment Products NO			x		
→ NDX Sweden					
→→ Structured Products SE	x				
→→ Miscellaneous Investment Products SE	x			x	
Nordic SME					
→ Nordic SME Norway			x		
→ Nordic SME Sweden	x				
→ Nordic SME Finland		x			
→ NGM PepMarket	x				
ETP					
→ ETP Denmark					
→→ Certificates DK	x				x
→→ Exotics DK	x				x
→→ Knock-Outs DK	x				x
→→ Plain Vanillas DK	x				x
→ ETP Norway					
→→ Certificates NO			x		
→→ Exotics NO			x		
→→ Knock-Outs NO			x		
→→ Plain Vanillas NO			x		
→ ETP Finland					
→→ Certificates FI		x			
→→ Exotics FI		x			
→→ Knock-Outs FI		x			
→→ Plain Vanillas FI		x			

Name	EC SE	EC FI	VPC NO	EC BE	VPS DK
→ ETP Sweden					
→→ Certificates SE	x				
→→ Exotics SE	x				
→→ Knock-Outs SE	x				
→→ Plain Vanillas SE	x				
Debt Securities Sweden MTF					
→ Corporate Bonds SE MTF	x				
→ Miscellaneous Debt Securities SE MTF	x				
Investment Products MTF					
→ Investment Products MTF Denmark					
→→ Structured Products MTF DK					x
→→ Miscellaneous Investment Products MTF DK					x
→ Investment Products MTF Finland					
→→ Structured Products MTF FI		x			
→→ Miscellaneous Investment Products MTF FI		x			
→ Investment Products MTF Norway					
→→ Structured Products MTF NO			x		
→→ Miscellaneous Investment Products MTF NO			x		
→ Investment Products MTF Sweden					
→→ Structured Products MTF SE	x				
→→ Miscellaneous Investment Products MTF SE	x			x	

2.4. Trading Session Schedule

See www.ngm.se for information on the trading calendar.

3. Trading Phases

The trading session is divided into different phases; *Pre Trading*, *Opening Auction*, *Trading*, *Closing Auction*, *Post Trading* and *Closed*. During these phases different rules apply for e.g. order entry and manual trade reporting. Also, in the transitions between the phases certain actions often occur. The details of each phase are described in the following sections. In the examples the Equity Stockholm schedule is used.

The state changes occur between the phases, i.e. the wordings *in the transition from the previous phase* versus *in the transition to the next phase* have great significance for when certain actions are performed in relation to the state changes.

NGM uses one regular trading session per day. No after hours trading sessions are used.

3.1. Pre Trading

Pre Trading is the first phase of the session. At the beginning of this phase the market data statistics, such as turnover, last price, average price etc., is reset.

During pre trading, members can enter orders and quotes, but no automatic matching is done. Full market data transparency applies to the *Pre Trading* as well as to the *Opening Auction* and *Closing Auction* phases.

Manual trades can be reported during the pre trading phase. They will be disseminated in the market data directly when they are confirmed.

Before the transition to *Opening Auction*, the equilibrium price is calculated and disseminated for each security.

3.2. Opening Auction

During the *Opening Auction* the same rules apply as in *Pre Trading*, in addition with continuous equilibrium price dissemination. The equilibrium price is recalculated and published every time an order book changes but no more than once per second per order book. If *Order Protection Mode* is activated, the equilibrium price is only present if the market maker provides a double-sided quote and furthermore the equilibrium price will always be within bid and ask price of the quote.

In the transition to the next phase, *Trading*, the call auction procedure is performed. During the call auction, the equilibrium price is calculated and the orders (and quotes) are uncrossed. Any remaining AtCrossing orders are canceled, unless the *Opening Auction* is extended into a *Market Maker Missing Auction*. Finally, all order changes are disseminated to the market data including the opening price and any trades that were made.

3.3. Trading

Trading (a.k.a. continuous trading) is the main phase, and the only phase when orders (and quotes) are automatically matched against any orders in the order book.

During continuous trading new orders are automatically matched against any orders on the opposite side in the order book. If the submitted order have any remaining volume it is placed into the order book and the order is disseminated on the market data. Full order depth is available in the market data.

Orders are matched according to the priority; price, internal, time.

Manual trades can be reported during the trading phase. They will be disseminated in the market data directly when they are confirmed.

3.4. Scheduled Auction

Auctions can be scheduled to take place at given times when the orderbook is otherwise in the *Trading* phase. These auctions will enter the phase *Scheduled Auction*. The *Scheduled Auction* phase can occur directly after *Pre Trading* or *Opening Auction* and can also be the last phase before *Closing Auction* or *Post Trading*.

During this phase, no automatic matching is done but members can submit new or change existing order or quotes with full market data transparency. The equilibrium price is recalculated and published every time an orderbook changes but no more than once per second per orderbook. If *Order Protection Mode* is activated, the equilibrium price is only present if the market maker provides a double-sided quote and furthermore the equilibrium price will always be within bid and ask price of the quote.

In the transition to the next phase, *Trading*, *Closing Auction*, or *Post Trading*, the call auction procedure is performed. During the call auction, the equilibrium price is calculated and the orders (and quotes) are uncrossed. Any remaining AtCrossing orders are canceled, unless the *Scheduled Auction* is extended into a *Market Maker Missing Auction*. Finally, all order changes are disseminated to the market data including the reference price and any trades that were made.

3.5. Closing Auction

Note that this phase only apply to the Equity segment category, instruments on other market segments will enter *Post Trading* when exiting *Trading*.

During this phase, no automatic matching is done but members can submit new or change existing orders or quotes with full market data transparency. The phase ends with a call auction where the same rules apply as for the opening call auction. An equilibrium price will be continuously disseminated for each security during this phase.

3.6. Post Trading

In *Post Trading* no automatic order matching is performed and no order market data is disseminated.

In the transition from the previous phase any ongoing quote validation request is timed out, all pending one-party manual trades for pass-thru are canceled and the order expire procedure is performed.

In the order expire procedure, all session orders (*time in force* = Session) and all quotes are canceled. These order changes are disseminated in the market data.

The preliminary closing price is disseminated at the beginning of this phase. Trade cancelations that affect the closing price can be done during the entire *Post Trading* phase, and the adjusted closing price is sent directly in that case. After this phase the closing price will not change due to trade cancelations, but may change for other reasons.

For ETP and Other segment instruments, the day closing price can be set to the theoretical price of the instrument during the entire *Post Trading* phase. A closing price with the MarketMakerQuote field set to 'Y' indicates that the closing price is theoretical and based on the quotation of the market maker.

For Equity segment instruments, the last trade price is the day closing price.

If no events resulting in a new closing price for the trading day has occurred, the closing price is inherited from the previous trading day.

During the post trading phase, manual trade reporting is not permitted. Session orders and quotes are not permitted during this phase, in order to avoid confusion about when they will expire. Other orders can be submitted, modified and canceled as if the operation was performed in the next *Pre Trading* phase, and they will receive the same time priority.

3.7. Closed

When the session is *Closed* almost no operations are permitted. It is possible to query the current state (snapshots) and to cancel orders and quotes. This phase normally lasts until *Pre Trading* the next trading day.

In the transition from previous phase *Post Trading*, the day statistics is generated and published.

During this phase corporate actions may be executed, possibly resulting in an adjusted closing price (disseminated directly) in case of e.g. a split. If a corporate action is executed, any orders or quotes in the order book will be canceled and this action is conveyed in the market data directly (as opposed to if the user canceled the order/quote).

The closing price may be adjusted, either as an effect of a corporate action, manually by the market operator or (for ETP and "Other" instruments) as an effect of theoretical closing price adjustment by the market maker (see below). A closing price may be adjusted more than one time.

For instruments of segment type ETP and Other, the day closing price can be set to the theoretical price of the instrument during the entire *Closed* phase, and will be disseminated immediately. A closing price with the MarketMakerQuote field set to 'Y' indicates that the closing price is theoretical and based on the quotation of the market maker.

3.8. Trade Halt

Trading may be suspended for regulatory reasons or other (e.g. technical) reasons. The stop reason is published in the market data.

When a security is halted any pending one-party manual trades for pass-through are canceled. All orders and quotes are also canceled and this is also conveyed directly in the market data.

During trade halt only query operations (snapshots) may be performed. After a trade halt the trading is normally resumed with a *Pre Trading* phase.

If the trade halt spans over multiple trading sessions or days, then closing prices may be disseminated and market data statistics cleared during the trade halt.

4. Trading Sub-States

The trading sub-state is used to indicate that an order book is no longer traded regularly. In the FIX Protocol, they are conveyed through the Financial Status field. These status flags exist in parallel with the trading phase, e.g. a security may be in *Pre Trading* and *Knock-Out Buyback* simultaneously. Some sub-states can coexist, e.g. *Buyback* and *Market Maker Missing Auction*.

A market maker can request that an order book enters a sub-state automatically (valid for certain sub-state transitions) by sending a request to update the security status via the NGM FIX protocol to the Exchange or manually by contacting NGM's market surveillance. The following sub-states may be activated or deactivated via the FIX protocol. A market maker shall contact NGM's Technical Support with request to enable this functionality.

- **Knock-Out**: Knock-Out Buyback is selected automatically if the security has Knock-Out Buyback option, otherwise regular Knock-Out is selected.
- **Buyback**

- **Distribution**
- **Recalculated**

4.1. Knock-Out

Securities that have a knock-out component can enter one of the following sub-states:

- **Knock-Out:** All trading is prohibited. Will be delisted after market closing.
- **Knock-Out Buyback:** Restricted trading. May remain in the market after closing.

Upon entering any of the knock-out sub-states, the order book is cleared. All the knock-out sub-states may be reversed.

4.2. Buyback and Distribution

Buyback and distribution are symmetrical sub-states that restrict trading. During buyback, only the market maker is allowed to buy and others only sell, and vice versa for distribution. All orders will match at the market makers price, and trades will be marked with the corresponding trade condition for the sub-state.

The following variants of these sub-states exists:

- **Distribution**: The security is in a distribution state.
- **Buyback**: The market maker might have sold all of its inventory or do not want to sell more quantity of a specific security. To avoid trading at incorrect sell prices the security enters this sub-state. When the market maker decides to resume quoting on the sell side the Buyback sub-state is deactivated and the security returns to normal trading.
- **Knock-Out Buyback**: This sub-state allows the market maker to buy back the outstanding volume of a knocked security at the redemption value, if the redemption value is greater than zero and the instrument is eligible for Knock-Out Buyback. Clients can then immediately sell its volume back to the market maker instead of waiting out the redemption period to receive the payment.

For the sub-states *Distribution* and *Knock-Out Buyback*, all (non market maker) orders are considered momentary (immediate) regardless of the time validity specified in the order.

Upon entering any of these sub-states, any illegal orders and quote sides are cancelled.

In the *Knock-Out Buyback* sub-state, no manual trades are allowed. When leaving this sub-state, the order book is cleared.

4.3. Auctions

During continuous trading one of the following auctions may be activated for various reasons. At most one auction is active at a time.

- **Dynamic Volatility Guard Auction**: Dynamic volatility guard was triggered, see Section 11, “Volatility Guards”.
- **Static Volatility Guard Auction**: Static volatility guard was triggered, see Section 11, “Volatility Guards”.
- **Market Maker Missing Auction**: Market maker is not present with a full quote, see Section 10, “Order Protection Mode”.
- **Missing Reference Price Auction**: Market orders cannot match, due to missing reference price. Not applicable here.
- **Unscheduled Auction**: General purpose unscheduled auction.

Equilibrium price is disseminated and as usual during these auctions.

5. Orders

5.1. Order Types and Validity

> **Note**
>
> Throughout this document:
> **a buy order** is also referred to as bid; and
> **a sell order** is also referred to as ask, or offer.

NGM exchange supports limit orders and market orders.

- **Limit:** A limit order stipulates a maximum purchase price (buy order) or a minimum selling price (sell order).
- **Market:** A market order buys or sells at the best available limit on opposite side. The only *time in force* that is allowed for a market order is IOC (see below). During the *Trading* phase, the market order matches against the best price level, any remaining quantity will be cancelled.

Market orders have priority over limit orders in auctions.

Protected instruments alters the way a market order works, by only matching market orders against prices equal to or better than the market maker’s price.

Each security defines whether it supports market orders and whether the market orders are protected or not. This information is communicated through the NGM FIX Protocol [FIX].

An order can have one of the following *time in force* instructions:

- **Session:** A session order is automatically canceled at the beginning of the next *Post Trading* phase. The order can rest in the order book, unless filled. Session orders are only permitted in the pre trading and trading phases.
- **Good Til Date/Time (GTD):** The order expires at the specified date and time. A time of up to 360 days (= 360 * 24 * 3600 seconds) into the future is permitted. The order can rest in the book, unless filled.
- **Good Til Canceled (GTC):** The order will remain in the order book until it is canceled or filled.
- **Fill or Kill (FoK):** Either the order is filled (entire volume) directly or it is canceled. The order cannot rest in the order book. FoK orders are only permitted during continuous trading (i.e. when no auction is active).
- **Immediate or Cancel (IOC):** Also known as Fill and Kill (FaK). As much of the volume as possible is filled, then the order is canceled. The order cannot rest in the order book. IOC orders are only permitted during continuous trading (i.e. when no auction is active).
- **AtCrossing:** An order that can only execute during auctions. The order may be submitted during the pre trading phase,

but remains inactive until the auction begins. During the auction, it participates in the price discovery process. Any unfilled portions are automatically canceled when the auction concludes.

Reserve orders (a.k.a. iceberg orders) are supported when time in force is GTC, GTD or Session, i.e. for orders that can rest in the order book. When a reserve order is placed into the order book only a portion of the total order volume is displayed in the market data, i.e. the order has a display volume which is less than the total volume. When the display volume is filled (matched) it is refreshed (refilled) as long as the order has any remaining volume. Each time the display volume is increased the order loses its time priority. The order can be refreshed either when the display volume is exhausted (empty) or immediate on a partial fill. The amount of volume to refresh is determined by the refresh method that is specified:

- **Initial:** The initial display volume will be used each time the order is refreshed.
- **New:** The refresh volume is explicitly specified in addition to the initial display volume. Each time the order is refreshed, the refresh volume will be used to set the display volume.

Reserve orders are only allowed in the round lot, and display/refresh volume must be a multiple of the round lot size. Also, the ratio between the refresh volume and the total order volume must not exceed a factor of 100.

Orders with volume greater than, but not an even multiple of, the round lot size are modeled as reserve orders. The round lot part is displayed while the odd lot is hidden and displayed once the entire round lot part is filled (matched). Once the order is moved to the odd lot it is automatically converted from a reserve order to a normal order.

A reserve order's total value (price multiplied by volume) in euro must be greater than or equal to the security's *MinReserveOrderValue* when the order is entered or modified by a client, otherwise the request will be rejected.

Each security holds a property, *MinTradeVol*, which is the smallest tradable unit on the NGM exchange for a given security. The order volume has to be equal or a multiple of *MinTradeVol* of the security.

If the reserve order's price intersects with the equilibrium-price during an auction in an instrument for which equilibrium prices are disseminated in the market data, the hidden volume of a reserve order will be included in the equilibrium volume published.

5.2. Action on Connection Loss

When all traders in a trader group are disconnected for any reason other than a normal logout the action on connection loss is triggered. For orders, this applies to securities in all trading phases except *Post Trading* and *Closed*. The action can be set to delete or no action. The default is no action.

5.3. Order Origin Attributes

Orders contain information on its origination. Certain attributes must for regulatory reasons be provided in orders, whereas others are either required as per the Member Rules [RULES] or free to decide upon by the member itself.

5.3.1. Regulatory Required Origin Attributes

5.3.1.1. Identifications

The following identification information must be specified to orders:

- Client identification code
- Investment decision within firm
- Execution within firm

In the NGM FIX Protocol [FIX] the information is provided as short codes. See Section 19, "Order Record Keeping" for more information about the use of short codes.

5.3.1.2. Order Attributes

The below listed order attributes may apply to orders. See the Member Rules [RULES] for more information on when they should be set.

- Liquidity Provision Activity Order
- Risk Reduction Order
- Systematic Internalizer Order
- Algorithmic Order

All attributes listed above, except for *Algorithmic* is set via the OrderAttributeGrp FIX group. An order is algorithmic if the FIX field PartyRoleQualifier for the investment decision within firm is set to Algorithm.

5.3.1.3. Trading/Order Capacity

The OrderCapacity (a.k.a Trading Capacity in MiFID II technical specifications) must be set in New Order Single messages and is an indication of whether the order submission resulted from the member or participant of the trading venue carrying out matched principal trading under Article 4(38) of Directive 2014/65/EU or dealing on own account under Article 4(6) of Directive 2014/65/EU.

Where the order submission did not result from the member or participants of the trading venue carrying out matched principal trading or dealing on own account, the field shall indicate that the transaction was carried out under any other capacity.

5.3.1.4. Direct Electronic Access

In case the order was sent through Direct Electronic Access (DEA), the corresponding flag in the message must be set. See the NGM FIX protocol [FIX] for more information.

5.3.2. Member Rules Required Origin Attributes

5.3.2.1. Order Restrictions

An order has the following order restrictions that can apply (see the member rules [RULES] for more information):

- Issuer Holding
- Issue Price Stabilization

5.3.3. Non-Required Origin Attributes

Orders have account information in the form of free text (ASCII), i.e. client side or non-client side, which will be copied to the trade reports for any fills of the order.

6. Quotes

The quote is an efficient way of keeping a spread in the market. A quote can be seen as two limit orders, buy and sell. The volume must be a multiple of the round lot size and a hidden volume (reserve order) is not supported. A quote expires at the beginning of the next *Post Trading* phase, i.e. it is handled the same way as a session order.

Zero spread (same bid and offer prices) quotes are supported and will not result in a trade between the sides of the same quote. Crossing prices are however not supported.

> **Note**
>
> Throughout this document:
> **a buy side of a quote** is also referred to as bid; and
> **a sell side of a quote** is also referred to as ask, or offer.

6.1. Action on Connection Loss

When all traders in a trader group are disconnected for any reason other than a normal logout the action on connection loss is triggered. For quotes the action is always cancel and applies to securities in all trading phases.

6.2. Quote Origin Attributes

Quotes contain information on its origination. Certain attributes must for regulatory reasons be provided in quotes, whereas others are either required as per the Member Rules [RULES] or free to decide upon by the member itself.

6.2.1. Regulatory Required Origin Attributes

6.2.1.1. Identifications

The following identification information must be specified to quotes:

- Client identification code
- Investment decision within firm
- Execution within firm

In the NGM FIX Protocol [FIX] the information is provided as short codes. See Section 19, “Order Record Keeping” for more information about the use of short codes.

6.2.1.2. Quote Attributes

Order Capacity and *Order Attributes* cannot be set explicitly. For quotes, *Order Capacity* is always "DEAL" (dealing on own account) and *Order Attributes* is always "Liquidity provision activity order".

Apart from the above named fixed field values, the below listed attributes apply to quotes. See the Member Rules [RULES] for more information on when they should be set.

- Algorithmic Order

A quote is algorithmic if the FIX field PartyRoleQualifier for the investment decision within firm is set to Algorithm.

6.2.2. Non-Required Origin Attributes

Quotes have account information in the form of free text (ASCII), which will be copied to the trade reports for any fills of the quote.

6.3. Market Maker Quotes

A market maker quote is a quote that originates from the market maker organization of the security.

Market maker quotes behave just as normal quotes, with the following exceptions:

- The public orders (market data) representing the market maker quotes are flagged in the market data feed.
- Market maker quotes are always considered passive in order matching (regarding price, however the aggressor side in trades is not affected). An exception occurs in the rare situation when market maker quote match against a quote with quote validation mechanism enabled or another market maker quote, then the active side always determines the trade price.

6.4. Quote Validation

The market maker often has thousands of securitized derivatives to update, many with the same underlying. Because of the burstiness of quote updates and network bandwidth constraints market makers are particularly exposed to delays of their operations.

As an alternative of limiting the number of issued instruments or increasing the spreads, which are the traditional ways to counter this, the quote validation mechanism has been designed. When it is enabled the market maker must validate the price of the quotes in the market resulting in fewer mistrades and tighter spreads.

The quote validation mechanism can be enabled for one market maker at a time for each security. Only one quote with quote validation is allowed per security at any given time.

When the security is in (continuous) trading, and an order is entered for a security with the quote validation mechanism enabled, one of the following actions is taken (see Section 16, “Quote Validation Examples” for examples):

1. If the order would result in a match (trade) with a quote from the market maker. → Put the order in a queue.
2. If there already are other orders in the queue. → Put the order in a queue (regardless if it would match the quote with quote validation).
3. Otherwise. → Same as without quote validation, i.e. match the order against any other orders in the order book and put the remaining volume in the order book of the security.

Orders that are placed in the queue are accepted but not executed nor visible in the market data. Orders that are deleted are removed from the queue immediately. An order in the queue that is modified will be moved to the end of the queue if the modification would cause the order to lose priority, otherwise the order will keep its place in the queue.

Immediately when an order is inserted into an empty queue a *Quote Request* message is sent to the market maker, indicating that a trade is imminent. Notice that no information about the order (price, type or volume) is given to the market maker. The market maker must reply to the *Quote Request* as fast as possible, within a specified time period. If no answer arrives within this period the quote is removed from the order book.

When a quote update is received from the market maker, one of the following actions is taken:

1. If the quote price changed (bid and/or offer). → Execute the quote update, possibly matching any previous orders in the order book. Execute all order operations in the queue and empty the queue. Notice that the market maker is the active party for any orders before the queue was executed, but passive against the orders in the queue.

2. Otherwise. → Execute all order operations in the queue and empty the queue.

The quote update is matched against the order book before the queue, this is because the update is modelled as occurring exactly before the first order was placed in the queue.

If no quote update is received within a specified timeout, which is currently 600 ms at NGM, the quote is automatically deleted and then all order operations in the queue are executed.

A quote update that is not a direct response to a *Quote Request* while awaiting a response, will be rejected. This way a market maker cannot accidentally accept a *Quote Request*. Once the reply is received or the timeout has been reached, spontaneous quote updates will be accepted again.

If the quote validation mechanism is enabled, orders will get the best possible price when matched against the quote and the security trading phase is trading. This means that regardless if the quote or the order was in the market first, the trade is done in favor of the order if the prices overlap. For example if there is a buy order at the price 12 in the market and then a quote with offer price 11 is entered, the price of the resulting trade is 11. Note that if two orders were matched in this example the price of the trade would have been 12.

Notice that no *Quote Request* is sent if the market maker moves its bid and/or offer so that it hits an order that is already in the market as the trade is immediately executed.

7. Matching

In this chapter the matching rules are briefly explained. Please see the member rules [RULES] for more information.

7.1. Order Priority

During (continuous) trading orders are automatically matched against orders on the opposite side, in the order book, given that prices are equal or overlap. Any remaining order volume is put into the order book. Orders are matched according to the following priority. Quotes are handled as two independent orders, priority wise.

1. Price

2. Internal

3. Time

Market orders will always receive a higher price priority than a limit order (applicable in auctions). A buy order with higher price has higher priority and a sell order with lower price has higher priority. If the prices are the same, then internal orders, i.e. orders from the same member firm are given higher priority. Finally, orders with a lower timestamp (older) have higher priority. The time priority is updated, i.e. set to the currently lowest priority, as follows:

- **New order:** Time priority is assigned.

- **Modified order:** If the price was changed or the display volume was increased the time priority is changed. Otherwise, unchanged.

- **Refill of reserve order:** Handled the same way as a modified order, i.e. if the display volume was increased the time priority is changed. Otherwise, unchanged.

When matching orders from the same firm (internal trades), in case of a reserve (iceberg) order, the display volume is reduced first. The time priority is updated when the display volume is refilled. After a refill of the display volume the order is placed last in the queue of the ongoing matching sequence. I.e. after a refill, the order does not gain priority over non-internal orders already queued for matching at the same price level in the same matching sequence.

In the call auction orders are matched according to the following priority:

1. Price

2. Internal

3. Time

7.2. Round and Odd Lots

Each order book is divided into the *round lot* and the *odd lot*. The *round lot size* specifies the normal trading unit, e.g. 100 shares. Orders with a volume greater than or equal to the round lot size are placed into the round lot. Smaller orders are put into the odd lot. No matching is done between the different lots. Orders in the *odd lot* can only be matched to the last traded price (automatic trades only, not manual trades), or closing price, of the *round lot*. The opening price is calculated based on the orders in the *round lot* only.

Note that at NGM the round lot size is either 1 or it has the field *minimum trade volume* set to the round lot size for most securities, which disables the odd lot functionality.

7.3. Tick Size

Each security has a decimal precision (default 3 decimals) for all prices, and a tick size table that specifies the price tick for each price interval for orders and quotes.

Each security has a tick size table that specifies the minimum price tick, for each price interval, that is valid for the price of an order or quote.

> **Note**
>
> The tick size table may be specified with a higher precision than the decimal precision of the security. E.g. tick increments of 0.0005 in a security with 3 decimals, will result in actual ticks increments of 0.001.

- An order or quote that does not follow the tick rules is rejected.
- Manual trades do not have to respect tick size, but must still obey the price decimal precision of the security.
- The maximum price value mantissa is 2^63-1 (a signed 64-bit integer).
- All orders and quotes will have their price adjusted to the less aggressive tick, if the tick size table changes for the security.

For a list of the commonly used tick size tables, see Section 18, "Tick Size Table Configuration".

7.4. Equilibrium Price

At the end of a security's auction, *Opening Auction*, *Closing Auction*, *Volatility Guard Auction* or *Market Maker Missing Auction* the equilibrium price is calculated. The equilibrium price is determined by the following rules:

- Select the price where *maximum volume* can be traded.
- If there is more than one such price, select the *minimum imbalance*.
- If there is more than one such price, select the *highest market pressure*, i.e. the highest price if excess demand or the lowest price if excess supply.
- If there is more than one such price, select the *average price* of the highest price with excess demand and the lowest price with excess supply, rounded to the nearest tick.

The equilibrium price is restricted to the market maker's bid and/or ask price when the sub-state is in any of *Knock-Out Buyback*, *Buyback* or *Distribution* (see Section 4, "Trading Sub-States") or the security is configured for *Order Protection Mode* (see Section 10, "Order Protection Mode").

The equilibrium price is used to determine the opening price, the closing price for segments that employs a *Closing Auction*, and the new reference price of a *Volatility Guard Auction*.

During any auction, the equilibrium price with accumulated buy and sell volumes are continuously disseminated for each security with a crossing order book.

8. Trades

The TVTIC (Trading Venue Transaction Identification Code) for a trade is the TradeID in TradeCaptureReport (private order-entry/back-office service).

Trades are available for 72 hours, during which time they will be provided to clients in snapshots. This is valid for both the order entry and market data services.

8.1. Manual Trades

For manual trade reporting, one-party report for pass-through to counterparty, is the only accepted trading model for *non-internal* trades. For internal trades, where the counterparty is the same as the reporting party, the two-party report trading model is also accepted.

Manual trades can be reported during *Pre Trading* and (continuous) *Trading*. Each trade have an agreement time that in most case differs from the reporting time. The agreement time, also called trade time, is the time when the trade was agreed on prior the actual report to the marketplace. The reporting time is set by the marketplace once the trade report has been received.

The trade type can be one of *Regular Trade* or *Exchange Granted Trade* (EGT), see the [RULES] for information on which one that should be used in different situations.

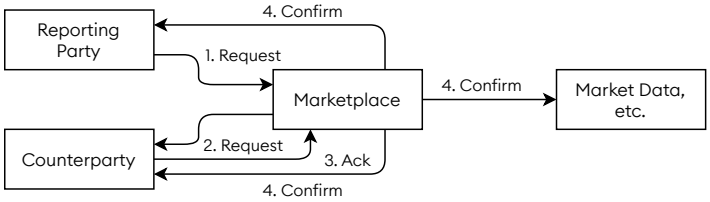
In MiFID II, the characteristics of the trade reported must be further specified. The list of characteristics that must be considered and filled in correctly for each reported trade are listed in Appendix A of the NGM FIX Protocol [FIX].

Each side of the trade have account information in the form of free text (ASCII).

8.1.1. One-Party Report for Pass-Through

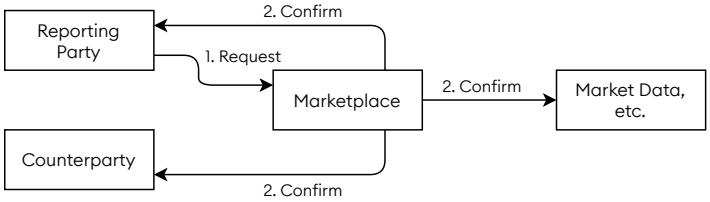
In the one-party report for pass-through model, the reporting party fills in the trade details such as account for its own side (i.e. for one party). The marketplace forwards the trade to the counterparty which fills in the trade details of the other side. Finally, the marketplace disseminates the trade to all parties. This trade model can be used for both internal trades and when the counterparty is another firm.

The reporting party can cancel the trade as long as it is not confirmed by the counterparty.



8.1.2. Two-Party Report

In the two-party report model the reporting fills in the trade details for both sides and the trade is confirmed by the marketplace directly. This model can only be used for internal trades, i.e. where the counterparty is the same firm as the reporting party.



8.1.3. Direct Electronic Access

In case the manual trade request or acknowledgment message was sent through Direct Electronic Access (DEA), the corresponding flag in the message must be set. See the NGM FIX protocol [FIX] for more information.

9. On Behalf Of

A provider may send requests on behalf of another member, if granted. See the NGM FIX protocol [FIX] for more information.

10. Order Protection Mode

The *Order Protection Mode* indicates, when active, that the security only allows matching when the market maker is present with a double-sided quote. If for any reason the market maker does not have a double-sided quote, a *Market Maker Missing Auction* will be triggered and matching is suspended.

Market Maker Missing Auction will be triggered whenever the market maker is not present with a full quote during the *Trading* phase. This means a double-sided quote in general, but in buy-back and distribution only a single-sided is required (and possible).

See Section 17, "Order Protection Mode Examples" for scenarios.

11. Volatility Guards

Volatility guards is a mechanism for automatically suspending the execution of orders when a certain price limit is reached or exceeded.

If the price of a potential execution is more than, or equal to, a defined percentage above or below the applicable reference price(s), then no executions at that price will occur. Instead, automatic execution will be temporarily suspended and an auction triggered, to allow the price of the security to re-form in an orderly fashion and then be returned to regular trading as above.

If the automatic execution suspension period is triggered midway through the execution of an order that is not Fill or Kill (FoK), a volatility guard call auction will be triggered. The residual volume of the order triggering the volatility guard call auction will take part in the call auction.

If the order that triggered the volatility guard call auction is an IOC order, any remaining volume of that order will be eliminated after the call auction, unless the call auction is extended into another auction. For all other orders the remaining volume will be added to the order book after the call auction.

FoK orders that would breach a price monitoring threshold will be rejected and no volatility guard will be triggered.

There are two types of volatility guards, static and dynamic volatility guards. Both types are only applicable during continuous trading.

When a static or dynamic volatility guard is triggered, the volatility guard auction is immediately initiated.

11.1. Static Volatility Guard

The reference price for the static volatility guard is the price from the last call auction. If no opening price has been generated then the previous trading day's closing price will be used as the reference price. If no previous closing price exists (i.e. the instrument has never been traded before, or has only been subject to late reported or outside spread manual trades), then the reference price will be set to the price of the first trade (other than the types of manual trades listed above) when it occurs.

If the static volatility guard has been triggered, without any trade resulting from the auction, the reference price of the static volatility guard will be set to the price of the last intraday trade.

If the dynamic volatility guard is triggered, without any trade resulting from the auction, no changes are made to the reference price of the static volatility guard.

11.2. Dynamic Volatility Guard

The reference price for the dynamic volatility guard is the price of the last intraday trade (call auctions included). If no intraday trade exists, then the previous trading day's closing price will be used as the reference price.

A new reference price is set immediately after the full set of trades resulting of an order action (new or update) has been executed. This means that if the order action results in multiple trades, the reference price is not set after each separate trade, but instead when the matching of the order has finished.

11.3. Configuration

Note that NGM may deem necessary to alter the limits for individual instruments as well as whole market segments with very short, if any, notice.

Table 4. Volatility guard configuration for each market segment.

Market segment	Dynamic	Static
Main Market Equity (*), Equities	D1 60s	S1 180s
Main Market Equity (*), Non-equities	D2 60s	S2 180s
Nordic AIF Sweden, Equities	D1 60s	S1 180s
Nordic AIF Sweden, Non-equities	D2 60s	S2 180s
Miscellaneous Nordic AIF Sweden	D1 60s	-
Nordic SME (*), Equities	D1 60s	S1 180s
Nordic SME (*), Non-equities	D2 60s	S2 180s
ETP (*)	-	-
Debt Securities Sweden (*)	D1 60s	-
Debt Securities Sweden MTF (*)	D1 60s	-
NDX Denmark (*)	D1 60s	-
NDX Norway (*)	D1 60s	-
NDX Finland (*)	D1 60s	-
NDX Sweden (*)	D1 60s	-
Investment Products MTF (*)	D1 60s	-

(*) Applies to all sub segments.

Table 5. Dynamic volatility guard limit table D1.

SEK, DDK, NOK	EUR, USD	Percentage
5-	0.5-	10%
0.25-5	0.025-0.5	25%
0.1-0.25	0.01-0.025	40%
0.05-0.1	0.005-0.01	50%
0-0.05	0-0.005	100%

Table 6. Dynamic volatility guard limit table D2.

SEK, DDK, NOK	EUR, USD	Percentage
5-	0.5-	20%

SEK, DDK, NOK	EUR, USD	Percentage
0.25-5	0.025-0.5	50%
0.1-0.25	0.01-0.025	80%
0.05-0.1	0.005-0.01	100%
0-0.05	0-0.005	200%

Table 7. Static volatility guard limit table S1.

SEK, DDK, NOK	EUR, USD	Percentage
5-	0.5-	15%
0.25-5	0.025-0.5	50%
0.1-0.25	0.01-0.025	75%
0.05-0.1	0.005-0.01	100%
0-0.05	0-0.005	200%

Table 8. Static volatility guard limit table S2.

SEK, DDK, NOK	EUR, USD	Percentage
5-	0.5-	30%
0.25-5	0.025-0.5	100%
0.1-0.25	0.01-0.025	150%
0.05-0.1	0.005-0.01	200%
0-0.05	0-0.005	400%

12. Pre-Trade Control

Pre-trade control is a mechanism for automatically rejecting orders (and non market maker quotes) with a price, volume or value (price * volume) which exceed a certain limit.

The price limit is calculated as a percentage above or below the applicable reference price(s). The value limit is a fixed value.

Reference prices are defined as follows:

- **Equity segments:** the last trade price, or the previous trading day's closing price.
- **ETP segments:** the current market maker quote bid (or ask if not present).
- **Other segments:** no reference price exists.

The pre-trade control mechanism works as follows:

- **Buy limit orders:** with a *too high* price will be rejected.
- **Sell limit orders:** with a *too low* price will be rejected.
- **All orders:** (including market orders) with a *too high* value will be rejected.

12.1. Configuration

As a general rule the pre-trade control price values are set to 3 times the static volatility guard that is applicable for each market segment.

Note that NGM may deem necessary to alter the limits for individual instruments as well as whole market segments with very short, if any, notice.

Table 9. Pre-trade control (PTC) configuration for each market segment.

Market segment	Price	Value	Volume
Main Market Equity (*), Equities	P1	VAL1	VOL1
Main Market Equity (*), Non-equities	P2	VAL2	VOL2
Nordic AIF Sweden, Equities	P1	VAL1	VOL1
Nordic AIF Sweden, Non-equities	P2	VAL2	VOL2
Miscellaneous Nordic AIF Sweden	-	VAL2	VOL2
Nordic SME (*), Equities	P1	VAL1	VOL1
Nordic SME (*), Non-equities	P2	VAL2	VOL2
ETP (*)	P3	VAL2	VOL2
Debt Securities Sweden (*)	-	VAL2	VOL2
Debt Securities Sweden MTF (*)	-	VAL2	VOL2
NDX Denmark (*)	-	VAL2	VOL2
NDX Norway (*)	-	VAL2	VOL2
NDX Finland (*)	-	VAL2	VOL2
NDX Sweden (*)	-	VAL2	VOL2
Investment Products MTF (*)	-	VAL2	VOL2

(*) Applies to all sub segments.

Table 10. Pre-trade control price limit table P1.

SEK, DDK, NOK	EUR, USD	Percentage
5-	0.5-	45%
0.25-5	0.025-0.5	150%
0.1-0.25	0.01-0.025	225%
0.05-0.1	0.005-0.01	300%
0-0.05	0-0.005	600%

Table 11. Pre-trade control price limit table P2.

SEK, DDK, NOK	EUR, USD	Percentage
5-	0.5-	90%
0.25-5	0.025-0.5	300%
0.1-0.25	0.01-0.025	450%
0.05-0.1	0.005-0.01	600%
0-0.05	0-0.005	1200%

Table 12. Pre-trade control price limit table P3.

SEK, DDK, NOK	EUR, USD	Percentage
5-	0.5-	60%
0.25-5	0.025-0.5	200%
0.1-0.25	0.01-0.025	300%
0.05-0.1	0.005-0.01	400%
0-0.05	0-0.005	800%

Table 13. Pre-trade control value limit table VAL1.

Condition	Value
5% of market cap (if applicable)	
SEK, DKK, NOK	25,000,000

Condition	Value
EUR, USD	2,500,000

Table 14. Pre-trade control value limit table VAL2.

Condition	Value
SEK, DKK, NOK	25,000,000
EUR, USD	2,500,000

Table 15. Pre-trade control volume limit table VOL1.

Condition	Value
5% of issued quantity (if applicable)	
Otherwise	100,000,000

Table 16. Pre-trade control volume limit table VOL2.

Condition	Value
Otherwise	100,000,000

13. Throughput Control

Each login account has a throughput limit set, which limits the number of messages that can be sent to the exchange per second (the time interval).

The default throughput limit set for each type of NGM account is specified in the Elasticia Access and Technical Services price list [PRICE].

When the throughput limit is exceeded for a time interval, the messages that exceed the limit are queued for the remaining period of the time interval. At the start of a new time interval, the throughput counter is reset and the processing of messages continues.

In order to prevent unintended queueing of messages, clients are advised to keep track of the messages sent to the exchange in relation to the throughput limit.

A client that exceeds the throughput limit during continuous trading is advised to either:

- Order an increased throughput from the exchange, or
- Reduce the rate at which messages are sent to the exchange

If a client wishes to increase its throughput limit, the NGM Support should be contacted.

For a detailed description of how the throughput control works please refer to the NGM FIX Protocol [FIX].

14. Market Data

Market data is generally disseminated continuously for events that happen in the trading system. Information about orders, quotes and trades is disseminated in real-time to the market, although orders and quotes are not distinguished in the market data feed. Market by orders is available and full order depth is published.

14.1. Orders, Quotes and Trades

Orders (and quotes) contain price, volume, owner member firm, last modified timestamp and a flag that indicates if the public order originates from a market maker quote. Orders in the private feed have a cross-reference to the public order identifier. Trades contain price, volume and buyer/seller member firms as well as trade and reporting timestamps. Trades also include various flags such as trade type, outside spread etc.

14.2. Reference Data

Reference data such as market structure and securities is available in real-time.

14.3. Corporate Actions

Information about planned and previous corporate actions (e.g. a split) is also available in the market data feed. A corporate action that affects the market price of a security will, when executed, cancel all orders and quotes in the order book and adjust the closing price accordingly. A corporate action is only executed when the security is closed.

14.4. Trading Statistics

Market data statistics are maintained by the exchange for 1) the current trading session, and 2) the current day. The statistics include turnover, last traded price, high/low price, average price, etc.

14.5. Accrued Interest

Certain instruments may have an accrued interest calculated.

Daily accrued interest rate is part of the day statistics and calculated upon the entry of a new trading day (i.e. the accrued interest includes the new trading day). The time of reset is the midnight of the ZoneID of the instrument. The ZoneID is Europe/Stockholm for all NGM markets, but may for individual instrument be specified individually. The accrued interest may also be recalculated and published at other occasions due to changes to instrument parameters or if manually triggered by the market operator.

Which business days to follow when calculating the accrued interest is determined by the business center specified for an instrument.

15. Direct Electronic Access

Direct Electronic Access (DEA) is supported in the form of Direct Market Access (DMA) and Sponsored Access (SA). Each legal entity conducting trading through DEA must advertise their trading activities as originating from DEA by setting the corresponding flag in the messages. See sections Section 5.3.1.4, “Direct Electronic Access” and Section 8.1.3, “Direct Electronic Access” and the NGM FIX protocol [FIX] for more information.

Clients are advised to consult the Member Rules [RULES] for more information on DEA and additional requirements.

16. Quote Validation Examples

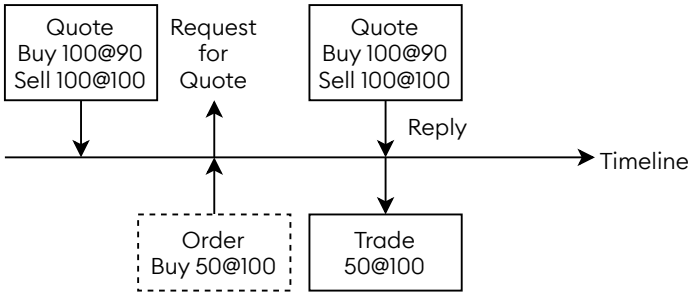
This appendix shows some examples to highlight some details of the quote validation mechanism.

16.1. Confirm Quote

The figure below shows a basic scenario of the quote validation mechanism. The market maker sends a quote with bid price

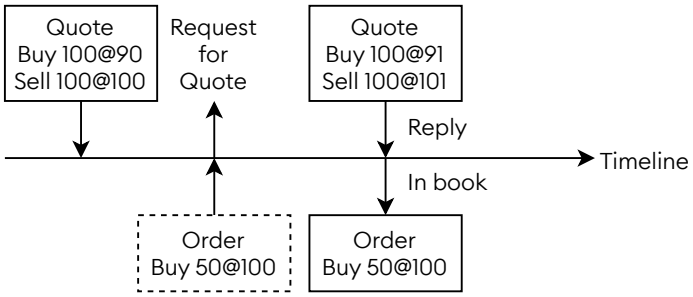
90, volume 100 and offer price 100, volume 100. A client sends a buy order price 100, volume 50, which matches the quote. The exchange sends a quote update request to the market maker and sets up a timeout, marked with the vertical line in the timeline. The market maker updates its quote, here with the same values as previously and a trade message is sent (to both parties).

The order is not visible on market data as it is never placed into the order book.



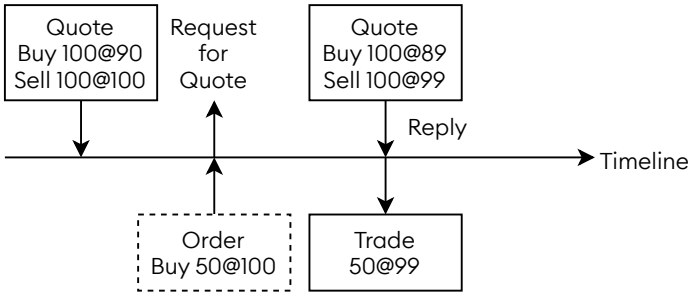
16.2. Change Price

The figure below shows a basic scenario where the market maker moves the spread (bid and offer price). The new price does not match the order, and it is put into the order book and is made visible on the market data as well as the new quote price.



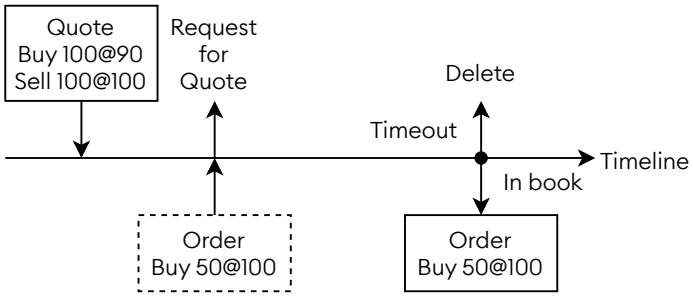
16.3. Change Price (2)

The figure below shows a basic scenario where the market maker moves the spread (bid and offer price), similar to the previous scenario but in the other direction. The new price matches the order and a trade is generated. The market maker is the active party in the trade but the order will get the best possible price for the client.



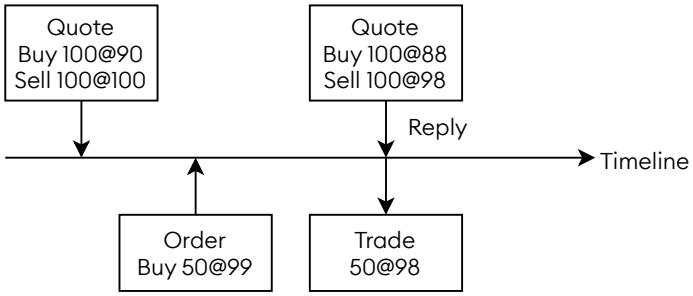
16.4. Timeout

The figure below shows another basic scenario, but here the market maker does not reply within the time frame. This is treated as if the market maker deleted the quote. The order is simply added to the order book and visible in the market data.



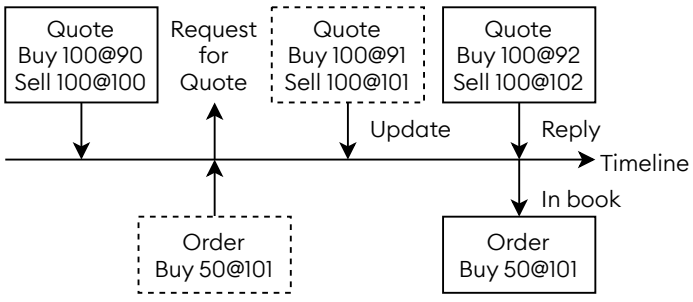
16.5. Quote Hits Order

The figure below shows another basic scenario; here the market maker quotes at 90 and 100. A client wants to buy at 99 and adds the order. As the prices does not match the quote it is directly added to the order book. The market maker then moves his quote to 88 and 98 and as the market maker hits the order already in the order book and is the active side a trade is immediately generated. The quote dictates the price (price is set in favor of the other party) since quote validation is enabled and the security trading phase is trading.



16.6. Rejected Update

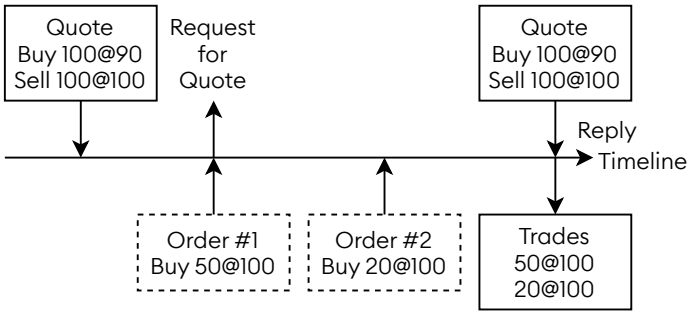
The figure below shows a basic scenario where the market maker starts at 90 and 100. A client wants to buy at 101 and a quote update request is sent to the market maker. Before the market maker receives the request it sends an update of the quote, to 91 and 101. Since this update is not a direct response to the request it is rejected. When the market maker receives the request it replies with a new quote at 92 and 102. No trade is made and the order is placed in the order book.



16.7. Two Orders

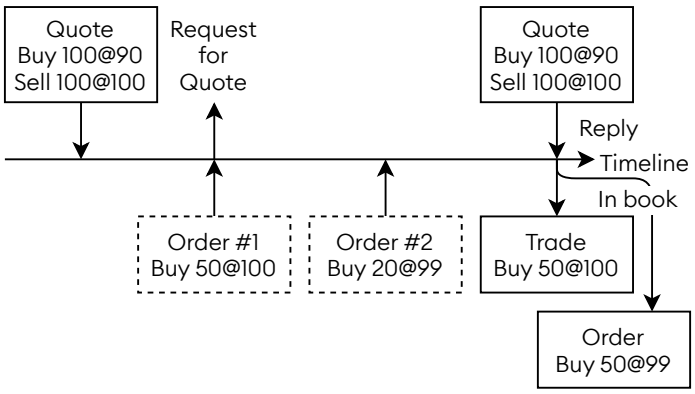
The figure below shows a scenario with two orders. Both orders match the quote but a request is only sent for the first quote.

When the reply is received trades are generated for both orders, since both of them match the quote.



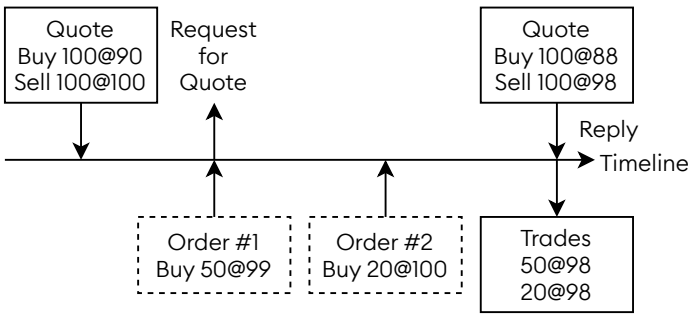
16.8. Two Orders (2)

The figure below shows a scenario with two orders. The first order matches the quote. The second order reaches the order book while the pending order queue is not empty and is also put into the queue, even though it does not match the quote. Once the quote reply arrives the first order is matched (trade) and the second order is put into the order book and visible on the market data.



16.9. Two Orders (3)

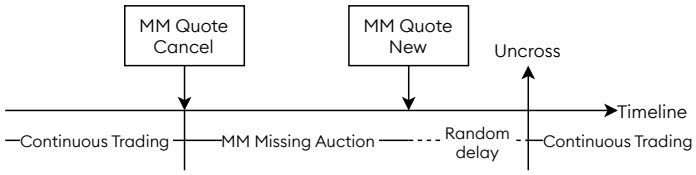
The figure below shows a scenario with two orders. The first order does not match the quote and is put into the order book directly. The second order matches the quote and a request for quote is sent to the market maker. The market maker replies with an updated price that also matches the first order. The quote is the active party for all orders that already exist in the order book (the first order). For the orders in the pending order queue (the second order) the quote is the passive party. In either case, the quote dictates the price (price is set in favor of the other party) since quote validation is enabled and the security trading phase is trading.



17. Order Protection Mode Examples

17.1. Market Maker Quote Cancel

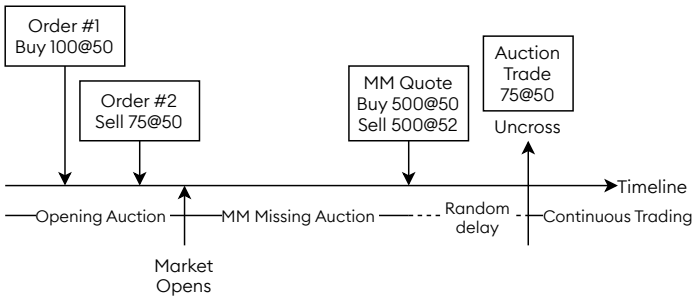
The figure below show a scenario where the market maker cancels its' quote during continuous trading, as a result, a *Market Maker Missing Auction* is triggered and matching is suspended. When the market maker re-enters the market with a new quote, the auction is ended within a random time interval.



17.2. Missing Market Maker Quote at Market Open

The figure below show a scenario where the market maker does not provide a quote when the market opens. As shown in the figure, when the market opens the *Opening Auction* switches over to an *Market Maker Missing Auction* and the matching of *Order #1* and *Order #2* is suspended until the end of the new auction.

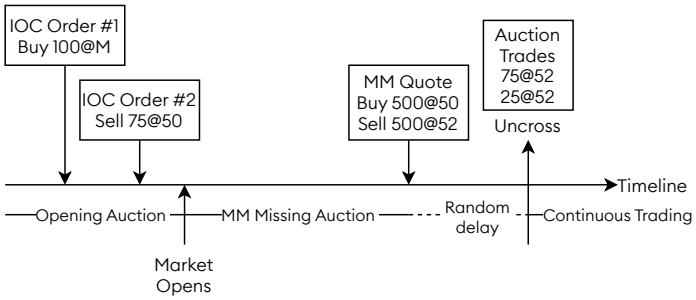
Order #2 is completely matched whereas *Order #1* will remain in the order book with a rest quantity of 25.



17.3. Missing Market Maker Quote at Market Open with IOC Orders

The figure below show a scenario where the market maker does not provide a quote when the market opens. Prior to the transition to *Trading*, an IOC limit order and a market order were submitted. When the market opens the *Opening Auction* switches over to a *Market Maker Missing Auction* and the *IOC market order* and *IOC limit order* remain in the order book during the *Market Maker Missing Auction*.

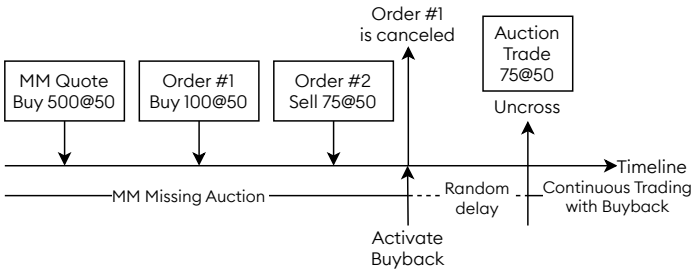
When continuous trading is initiated, both orders are fully matched.



17.4. Buyback Activated During Market Maker Missing Auction

The figure below show a scenario where a *Market Maker Missing Auction* is ongoing during which the market maker provides a bid quote. In addition, there are 2 limit orders present in the order book. Buyback is activated during the auction which will end the *Market Maker Missing Auction* with a random delay, since the market maker is now present according to the new rules (bid is present).

In the transition to Buyback, all buy orders are canceled. The remaining sell order, *Order #2*, will match against the bid quote.



18. Tick Size Table Configuration

Below the common tick size tables are listed. Note that other tick size tables than the ones listed below could occur. Furthermore, the tick size table should always be read directly from the individual instrument.

Liquidity band 1-6 applies to shares and depository receipts, based on average daily transaction count:

1 < 10

2 < 80

3 < 600

4 < 2000

5 < 9000

6 Otherwise

Tick size table 7-9 applies as follows:

7 Non-equities on equity segments

8 ETP segments

9 Other segments

Table 17. Tick size tables for liquidity bands 1-6.

Price	1	2	3	4	5	6
0-	0.0005	0.0002	0.0001	0.0001	0.0001	0.0001
0.1-	0.001	0.0005	0.0002	0.0001	0.0001	0.0001
0.2-	0.002	0.001	0.0005	0.0002	0.0001	0.0001
0.5-	0.005	0.002	0.001	0.0005	0.0002	0.0001
1-	0.01	0.005	0.002	0.001	0.0005	0.0002
2-	0.02	0.01	0.005	0.002	0.001	0.0005
5-	0.05	0.02	0.01	0.005	0.002	0.001
10-	0.1	0.05	0.02	0.01	0.005	0.002
20-	0.2	0.1	0.05	0.02	0.01	0.005
50-	0.5	0.2	0.1	0.05	0.02	0.01
100-	1	0.5	0.2	0.1	0.05	0.02
200-	2	1	0.5	0.2	0.1	0.05
500-	5	2	1	0.5	0.2	0.1
1,000-	10	5	2	1	0.5	0.2
2,000-	20	10	5	2	1	0.5
5,000-	50	20	10	5	2	1
10,000-	100	50	20	10	5	2
20,000-	200	100	50	20	10	5
50,000-	500	200	100	50	20	10

Table 18. Tick size tables 7-9.

Price	7	8	9
0-	0.001	0.001	0.01
0.5-	0.005		
1-	0.01	0.01	
5-	0.05		
10-	0.1		
50-	0.5		
500-	1		
5,000-	5		

19. Order Record Keeping

19.1. Introduction

This section specifies the requirements for the daily reporting of short codes and the mapping to their actual values. For requirements on short codes in relation to order (and quote) entry in the protocol, please see the section on Order Record Keeping in the NGM FIX protocol [FIX].

19.1.1. Regulatory requirement for exchanges

Exchanges are required to collect and upon request by the National Competent Authorities provide various information related to orders. Among this information certain identification related to the client of the order (if any), the investment decision maker and the responsible for the execution within the member firm. Note that the term orders in the context of Order Record Keeping and short codes includes *quotes* as well.

The regulatory description of the relevant data to collect is the following:

- **Client identification code:** Code used to identify the client of the member or participant of the trading venue. In case of DEA, the code of the DEA user should be provided. Where the client is a legal entity, the LEI code of the client shall be used. Where the client is not a legal entity, the NATIONAL_ID shall be used. *Alternative flagging should be used in case of aggregated orders, pending allocations or if there is no client of the member or participant of the trading venue*
- **Investment decision within firm:** Code used to identify the person or the algorithm within the member or participant of

the trading venue who is responsible for the investment decision. Where a natural person(s) within the member or participant of the trading venue is responsible for the investment decision the person who is responsible or has primary responsibility for the investment decision shall be identified with the NATIONAL_ID. Where an algorithm is responsible for the investment decision the field shall be populated in accordance with Article 8 of RTS 22 on transaction reporting under Article 26 of Regulation (EU) No 600/2014. This field shall be left blank when the investment decision was not made by a person or algorithm within the member or participant of the trading venue

- **Execution within firm:** Code used to identify the person or algorithm within the member or participant of the trading venue who is responsible for the execution of the transaction resulting from the order.
  Where a natural person is responsible for the execution of the transaction, the person shall be identified by NATIONAL_ID
  Where an algorithm is responsible for the execution of the transaction, this field shall be populated in accordance with Article 9 of RTS 22 on transaction reporting under Article 26 of Regulation (EU) No 600/2014.
  Where more than one person or a combination of persons and algorithms are involved in the execution of the transaction, the member or participant or client of the trading venue shall determine the trader or algorithm primarily responsible as specified in Article 9(4) of RTS on trading obligations under Article 26 of Regulation (EU) No 600/2014 and populate this field with the identity of that trader or algorithm.

The Member Rules [RULES] contains more information on the legal requirements affecting members of the exchange.

19.2. Short Codes

NGM has decided not to let members supply the actual identifiers over the normal NGM FIX protocol [FIX], but instead use a concept of short codes, where members provide short codes in the NGM FIX Protocol [FIX] and report their corresponding actual values outside the protocol.

19.2.1. Short Code Requirements

- **Format:** The format of short codes in the NGM FIX Protocol [FIX] are 8 byte unsigned integers(*).
- **Reserved values:** The values 0-10 are reserved and must not be used for short codes.
- **Immutable:** Short codes are immutable and must not change over time. This holds true even in the case of a wrongly assigned short code.
  As for some jurisdictions the long codes for a person (National ID) may change over time, it should be clarified that the short codes should remain the same for the same person. It is possible to update a mapping by assigning a start and end date for a short code mapping.
- **Short code series:** NGM support three series of short codes:
  - Person (National ID)
  - Entity (LEI)
  - Algo (Algo ID)

In the order entry as well as in the mapping to long codes, participants will be required to reference each code to one of the three series above. The same short code numeric value can be used in each of the series.

(*) *Although 8 byte integers are allowed, clients are advised to use low numbers in order to keep the network footprint low.*

19.3. Reporting of Short Code Mappings

For information on the reporting of short code mappings refer to the NGM - Reporting of Short Codes [ORK] document.

Bibliography

FIX *NGM FIX Protocol*, Nordic Growth Market.

SCHEMA *NGM Instrument Schema*, Nordic Growth Market.

RULES *Member Rules*, Nordic Growth Market.

NETWORK *Network Connectivity in Elasticia*, Nordic Growth Market.

PRICE *Elasticia Access and Technical Services - Price List*, Nordic Growth Market.

ORK *NGM - Reporting of Short Codes*, Nordic Growth Market.