DEUTSCHE BÖRSE
CASH MARKET

Xetra® Release 17.0

Market Model Continuous Auction

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1 Introduction

Xetra is the pan-European electronic trading system of Deutsche Börse AG for cash market trading in equities and a variety of other instruments including Exchange Traded Funds (ETFs), Exchange Traded Products (ETPs)[1], mutual funds, bonds, warrants, certificates and subscription rights. Xetra was introduced in November 1997 in order to create a transparent and efficient way of automated trading at the Frankfurter Wertpapierbörse (FWB; Frankfurt Stock Exchange). Since its introduction Xetra has been enhanced through further releases adding functions and capabilities according to market needs.

With Xetra Release 9.0 a new market model comprising the two trading models[2] 'Continuous Auction with Market Maker' and 'Continuous Auction with Specialist' was introduced. Xetra Release 11.0 enhanced the market model by introducing Indicative Quotes as a new quote type within the 'Continuous Auction with Market Maker' trading model. Xetra Release 13.0 enhanced the trading model 'Continuous Auction with Specialist' by introducing the trading restriction 'Special Auction' and Quote Request functionality. With Xetra Release 16.0 the functionality "Direct Exchange Trading" was introduced, enhancing and broadening the Quote Request functionality.

The purpose of this document is to describe electronic trading of instruments in the Continuous Auction trading models. Documentation on electronic trading of instruments in the trading model 'Continuous Trading in Connection with Auctions' ('Market Model Equities') as well as the market model for Xetra BEST are available separately.

The market model defines the principles of order matching and price determination as implemented in the trading system Xetra. This includes the available trading models, the prioritization of orders, the different order types and the transparency, i.e. the type and the extent of information available to market participants during trading hours. It represents the current implementation status.

The ultimate and legally binding terms for trading at the Frankfurter Wertpapierbörse are laid down in the Rules and Regulations of the exchange, especially the Exchange Rules (Börsenordnung) and the Terms and Conditions for Transactions (Bedingungen für Geschäfte). The market model serves as a basis for the Rules and Regulations which, nevertheless, may contain additional terms and in particular may exclude or restrict the use of order and quote types described in this market model.

1.1 Definitions

TERM	EXPLANATIONS / DEFINITIONS / SYNONYMS
Instrument	An instrument is a security that is set up in one of the Continuous Auction trading models for trading.
Tick Size	A tick size represents a limit price / range step.
Executable order book situation	An executable order book situation is an order book situation in which a crossed order book occurs within the spread of the quote or without generating a partial execution of an order executable at the quote.

[1] Exchange Traded Products (ETPs) include Exchange Traded Commodities (ETCs) and Exchange Traded Notes (ETNs).

[2] Technically only a single trading model will be used.

TERM	EXPLANATIONS / DEFINITIONS / SYNONYMS
Potentially executable order book situation	A potentially executable order book situation is an order book situation in which a crossed order book or a market order exists without an available quote.
Potentially executable volume	The potentially executable volume is defined as the surplus at the potentially executable price, excluding the volume of the quote.
Fully open order book	All orders (incl. stop orders and orders in the locked stock) on single order basis including their originator are distributed (only for Specialists).
Open order book	All limit and market orders with their respective volume are displayed with the order book depth assigned to the security. The orders are accumulated by their limits and the number of orders per limit is displayed. While the Market Maker quote will be displayed as part of the order book, the Specialist quote might be displayed separately.
Partially closed order book	Depending on the trading model and the trading phase only the Specialist or Market Maker quote is displayed. While the Market Maker quote will be displayed as part of the order book, the Specialist quote might be displayed separately.
Closed order book	No pre-trade information is displayed. Only post-trade information are available.
Minimum tradable unit/lot size	The minimum tradable unit/lot size is the minimum quantity that an order in the Xetra system can have. Only orders with quantities equal to multiples of the minimum tradable unit/lot size are accepted by the system.
Consolidated Exchange Feed	CEF: Central information distribution system of the Deutsche Börse AG

2 Fundamental Principles of the Market Model

The following fundamental principles for trading in the Continuous Auction trading models were determined in the process of designing the market model:

1. Securities can either be traded in the trading model 'Continuous Auction with Market Maker' or 'Continuous Auction with Specialist'.
2. Trading is anonymous, i.e., market participants cannot identify which market participant entered an order pre-execution. Only the Specialist is able to identify the originator of an order.
3. All order sizes can be traded in both trading models.
4. The order is valid for a maximum of 360 calendar days (including the current day) from the date of entry.
5. Stop limit and stop market orders are supported. Furthermore, Trailing-Stop Orders, One-cancels-other Orders and Order-on-event are supported.
6. In trading model 'Continuous Auction with Specialist' members can enter quote requests which will in turn be answered by the Specialist with a response. Sender of the quote request may answer this response by entering a binding order.
7. Depending on the trading model during the main trading phase the Specialist or Market Maker provides quotes to the market. Specialist/Market Maker quotes can be modified or deleted (only valid for standard quotes and indicative quotes). Specialist/Market Maker quotes might have a volume equal to or greater than zero, have to be double sided and must bear a limit on the bid side of higher than zero. The limit on the ask side can only be equal to or higher than the limit on the bid side.
8. Depending on the trading model there is exactly one Specialist/Market Maker per instrument.
9. Order book transparency can vary for particular groups of securities and furthermore depends on the respective trading phase or auction phase. For market participants the order book can be partially closed or open.
10. The Specialist is able to enter orders (and quotes) on own behalf and on behalf of other trading participants (in instruments assigned to him).
11. In both trading models there is always exactly one price in an instrument at one point of time.
12. Depending on the trading model prices are determined only within or at the Specialist/Market Maker quote according to the modified principle of highest executable volume.
13. Price determination: If there are several possible limits with the same surplus on the bid and the ask side or with no surplus on hand, the midpoint of the possible prices is taken into account as an additional criterion.
14. Orders in the order book are executed according to price/time priority.
15. After price determination the Market Maker quote is not deleted. Remaining parts of the quote stay in the order book. In the Specialist model the (matching) quote is deleted after price determination.
16. Trade confirmations are disseminated immediately after the respective trade.
17. During post-trading phase the order book is closed for market participants.
18. The accounting cut off is carried out daily subsequent to the post-trading phase.

3 Products and Segmentation

In order to ensure efficient trading, instruments are segmented into different groups. Possible criteria for segmentation are, for example, liquidity, index affiliation and country of origin. The trading segments valid in Xetra are not dependent on the existing legally stipulated admission segments (market segments) at the Frankfurter Wertpapierbörse.

A trading segment consists of a specific number of instruments for which trading is organized in the same way. Certain parameters of the market model concerning trading model, order book transparency, trading times etc. can be configured for one trading segment. A combination of parameters is selected for each trading segment, which specifies the trading process in the respective segment.

The description at hand is referring to the standard configuration of the trading models. For specific trading segments there may be deviations from the norm.

4 Market Participants

A trading participant in a Continuous Auction Model must meet the requirements for participating in exchange trading according to the Rules and Regulations of the Frankfurt Stock Exchange. It must also be guaranteed that transactions are settled properly by the trading participant or a clearing member has been commissioned to settle the trades of the trading participant.

The users of the system can be divided into several categories:

- Traders
  Traders are individuals admitted for exchange trading. A trader can act as agent trader (account "A") or as proprietary trader (account "P"). Orders will be flagged accordingly.
- Market Makers
  In the trading model 'Continuous Auction with Market Maker', the Market Makers are admitted to exchange trading. In addition to traders the Market Makers participate as liquidity providers by entering binding quotes into the system ("Market Maker", account "I").
- Specialists
  In the trading model 'Continuous Auction with Specialist', the Specialists are admitted for exchange trading and participate as information and liquidity providers by entering quotes into the system ("Specialist", account "I"). These quotes are based on the current order book situation and might in addition be based on the defined reference markets (if available). In addition the Specialist is able to enter orders on behalf of other trading participants.
- Other Users
  Administrators are users which are not admitted or authorized for trading (they assign and maintain authorization rights for the member's personnel). This category also includes personnel in settlement, operation and supervision as well as information users.

5 Orders and Quotes

All order sizes can be traded which have a determined minimum lot size for the specific security. The specific lot size may be one.

An order modification which is relevant for matching leads to a change of its price/time priority. This modification results in the deletion of the order and the entry of a new order (i.e. new time stamp, new order number). Modifications that are not relevant for matching do not influence the price/time priority.

5.1 Basic Order Types

Two basic order types are admitted for price determination during Continuous Auction:

Market orders are unlimited bid/ask orders. They are to be executed at the next price determined.

Limit orders are bid/ask orders, which are to be executed at their specified limit or better.

Order types can be specified further through additional validity constraints. Execution constraints (e.g. FOK, IOC and BOC) and trading restrictions (e.g. opening auction only, closing auction only etc.) are not supported in these trading models.

In the trading model 'Continuous Auction with Specialist' for specific securities determined by the Exchange the trading restriction 'Special Auction' is supported. Orders with this trading restriction will only be considered for price determination in the Special Auction. These orders will not participate in other auctions conducted throughout the trading day.

5.2 Validity Constraints

The validity of orders can be determined by means of further constraints. To this effect, the market model offers the following variations:

Good-for-day (GFD): Order only valid for the current exchange trading day.

Good-till-date (GTD): Order only valid until a specified date; maximum validity is 360 calendar days including the current exchange trading day (=T+359).

Good-till-cancelled (GTC): Order only valid until it is either executed or deleted by the originator or the system on reaching its maximum validity of 360 calendar days including the current exchange trading day (=T+359).

5.3 Stop Orders

In order to support trading strategies, two stop order types can be used, the execution of which will be possible after reaching a predefined price level (stop price). In contrast to other Xetra trading models stop orders are not triggered by a price determination but by Specialist/Market Maker quotes:

Stop Market Order: When the stop limit is reached (or exceeded for stop buy orders or fallen below for stop sell orders), the stop order is automatically placed in the order book as a market order and might be executed immediately.

Stop Limit Order: When the stop limit is reached (or exceeded for stop buy orders or fallen below for stop sell orders), the stop order is automatically placed in the order book as a limit order and might be executed immediately.

The stop limit for both types of stop orders might be reached by a Specialist/Market Maker quote. A stop buy order is triggered if the stop limit is equal to or below the ask limit of the Specialist/Market Maker quote. A stop loss order is triggered if the stop limit equals or exceeds the bid limit of the Specialist/Market Maker quote. The triggering of stop orders always leads to a new time stamp for these orders. The limit and market orders resulting from triggered stop limit or stop market orders will be considered for execution in the current auction and might be executed immediately.

5.4 Additional Order Types

Furthermore, the following order types are supported in Continuous Auction:

Trailing Stop Order: A trailing stop order corresponds to a stop market order with a dynamic stop limit. As dynamic stop limit a stop limit and/or an absolute or relative distance to the reference can be entered. A margin with respect to the reference, expressed as an absolute value or as a percentage, and/or a stop limit may be entered as the dynamic stop limit. From the time of the entry of the order into the order book, the trading system continually checks the dynamic stop limit against the reference. Analogous to stop orders, the reference for trailing stop orders in Continuous Auction is the Specialist/Market Maker quote.

If the reference increases - in case of a sell trailing stop order -, the trading system automatically adjusts the dynamic stop limit to fit the requirements. If the reference decreases, the dynamic stop limit remains unchanged. If the reference reaches or falls below the dynamic stop limit, the trailing stop order is triggered.

If the reference decreases - in case of a buy trailing stop order -, the trading system automatically adjusts the dynamic stop limit to fit the requirements. If the reference increases, the dynamic stop limit remains unchanged. If the reference reaches or exceeds the dynamic stop limit, the trailing stop order is triggered.

One-cancels-other Order: A One-cancels-other Order is an order that combines a limit order and a stop order provided that the order whose limit or stop limit is reached first is executed first; the excluded order is deleted at the time of execution. In case of a partial execution of the limit order, the limit order with the non-executed volume remains in the order book and the volume of the stop order is adjusted accordingly. In case of a partial execution of a market order or limit order, such market order or limit order having resulted from a triggered stop order, the order with the non-executed volume remains in the order book.

Order-on-event: An Order-on-Event is a buy or sell order which is triggered upon an event (trigger event) and enters the order book as a market or limit. The Management Board determines Indices, Futures and Securities in which a event can trigger an Order-on-Event (reference instruments). Trigger events can be defined as reaching, rising above or falling below a previously defined index or price level in a reference instrument.

5.5 Quote Request

During pre-trading and main trading phase in the trading model 'Continuous Auction with Specialist', market participants can ask the respective Specialist to post a quote by entering a quote request. The originator can optionally specify the volume that shall be traded and whether there is buy or sell interest. The existence of a quote request is only transparent to the Specialist and can be answered by submitting an appropriate standard quote.

5.6 Direct Exchange Trading (Quote Request Driven Trading in Continuous Auction with Specialist)

During main trading phase for 'Continuous Auction with Specialist' Direct Exchange Trading is possible for structured products. Within the model Direct Exchange Trading a participant's request (Quote Request), the quote answer of the specialist and the order based upon that answer refer to each other.

Market participants can ask for an indicative quote submitting the ISIN, the quantity they would like to trade and optionally the side (buy or sell) they intend to trade. This request is being answered by the specialist either with a quote response containing an adequate bid/ask with the available quantity or with an error message in case no current and adequate quote e.g. in terms of quantity is available.

Having received an adequate answer the participant may submit a limit order based on the quote response. The order is marked with a timestamp. The specialist must fulfil his obligations and enter a matching quote if the order is executable (pls. refer to chapter 7.2). Orders upon a quote response will always need to be executed fully or not at all.

Both quote request and order upon a quote response outdate after a certain period and are then rejected.

A quote request sent out by the market participant contains the following input values: ISIN, QuoteID (unique per instrument and member during the trading day) and optionally a quantity and a BuySellIndicator.

Quote requests may be rejected and returned with a respective error message in case of unsupported ISINs (e.g. instruments in subscription) or in case there is no adequate quote available (e.g. in terms of quantity).

In case a valid quote is available the specialist answers by submitting a quote response that contains the values ISIN, QuoteID, bid limit, ask limit, quantity bid and quantity ask.

The limit order submitted upon a quote response is validated against the QuoteID and the time component. A valid order is executed according to the matching rules of the market model (pls. refer to chapter 7.1.3).

5.7 Quotes

Depending on the trading model quotes can be entered by the Market Maker or by the Specialist. There might be a different functionality / handling for these parties.

Four different types of Specialist/Market Maker quotes are supported:

- standard quotes,
- indicative quotes with volume ('Continuous Auction with Market Maker' only),
- matching quotes, dedicated to terminate a call/freeze phase and
- price without turnover quotes, dedicated to determine a price without turnover.

In general, these quotes have to be entered double sided. They can be entered with a zero volume on both sides or on one side only, either on the bid side or on the ask side or with non-zero volume on both sides.

Market Maker quotes are displayed to the market as part of the order book. Specialist quotes might be displayed separately from the order book.

The Market Maker can be obliged to provide firm quotes throughout the trading day. If defined the Market Maker must quote for at least a minimum guarantee size and with a maximum spread in all assigned instruments. Standard quotes in the 'Continuous Auction with Market Maker' trading model may either be indicative or binding, depending on whether they are entered with a volume of zero or a positive volume, respectively. Indicative quotes are always indicative, irrespective of the volume entered.

The Specialist is obliged to provide quotes throughout the trading day for information purposes and for the provision of liquidity. In his quotation the Specialist is obliged to take the current order book situation and if defined the respective reference markets into account. If defined the Specialist must quote for at least a minimum guarantee size and with a maximum spread in all assigned instruments.

For trading in securities whose settlement currency differs from the trading currency, the Specialist can enter an exchange rate together with his matching quote. Conversion of the actual amount into the settlement currency is made using this exchange rate.

5.8 Handling of Orders and Quotes in Case of an Exceptional Trading Situation

The exchange can suspend trading on instrument level or market level in the event of extraordinary events affecting prices (e.g. company news). Orders and quotes existing in the system are deleted.

Orders in the order book are deleted in the event of profits or a corporate action and/or an exchange at the end of the last trading day on which such security was last traded including the claim (cum-day) or, at the latest, at the start of trading on the trading day on which such security is traded excluding the claim (ex-day).

Structured products with a knock-out event or violation of barrier limit are temporarily suspended after the event occurs. The duration of the suspension has to be coordinated with the respective Issuer. If the instrument gets unsuspended only the entry of sell orders is possible for Order Flow Providers until the respective instrument is delisted or the maturity date of the respective instrument is reached. For Specialist/Issuer only single-sided quotes for repurchasing of orders are allowed.

6 Trading Phases

Trading takes place all day and begins with the pre-trading phase followed by the main trading phase and the post-trading phase. The system is not available for trading between the post-trading and pre-trading phase.

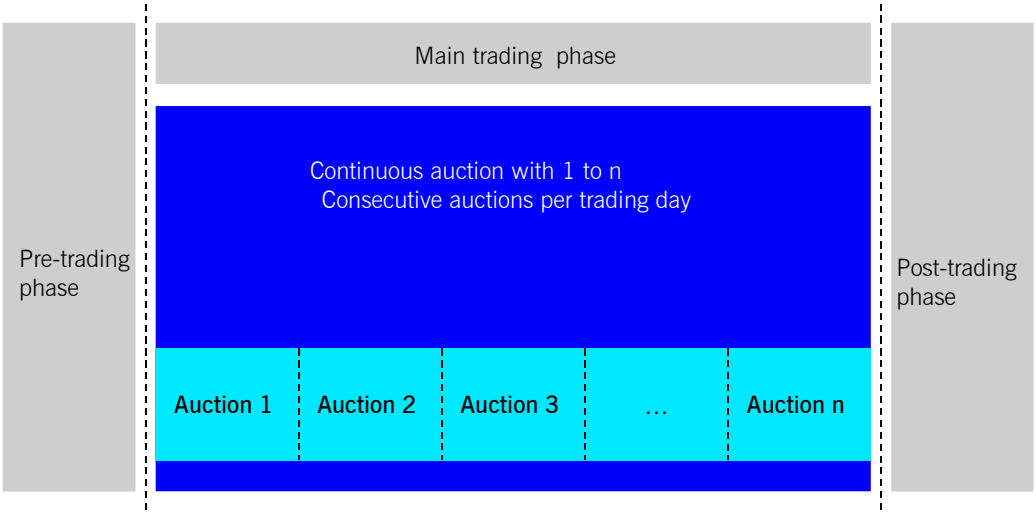


Figure 1: Flow of trading

6.1 Pre-Trading Phase

The pre-trading phase initiates the trading day. All market participants can enter orders and Specialists/Market Makers can enter quotes or orders to prepare the actual trading day and modify or delete their existing orders or quotes.

The exchange confirms the member's order entry and maintenance by order confirmation.

For market participants (incl. Market Makers) the order book is partially closed. Only the Specialist receives an overview of the order book situation. Depending on the trading model only the Specialist quote or the best bid and best ask limit including the Market Maker quote are displayed to the market. In addition the last price fixed of the previous day is displayed.

6.2 Main Trading Phase

The main trading phase starts time triggered after the pre-trading phase.

Matching takes place in auctions. In general an auction consists of two phases ('Continuous Auction with Market Maker': a pre-call phase and an optional call phase; 'Continuous Auction with Specialist': a pre-call phase and a freeze phase) and the price determination.

Trading model 'Continuous Auction with Market Maker':
During the pre-call phase and call phase, all market participants can enter, modify, or delete orders. In addition, Market Makers can enter or delete quotes.

Trading model 'Continuous Auction with Specialist':
During the pre-call phase all market participants can enter, modify, or delete orders as well as enter quote requests. In addition, Specialists can enter, modify, or delete quotes and orders on own behalf or on behalf of other market participants. During the freeze phase the order book is locked by the Specialist. Order entries, modifications or deletions are not considered during the freeze phase. Such instructions are stored (locked stock/Vorhaltebestand) and enter the order book immediately after it gets unlocked. The Specialist is still able to enter, modify, or delete quotes or orders on own behalf or on behalf of other market participants during the order book freeze.

6.3 Post-Trading Phase

The post-trading phase starts time triggered after the main trading phase. If at this point in time an auction is still running, the auction will be regularly ended, i.e. in this instrument the post trading phase might begin after the maximum duration of the call/freeze phase.

In the post-trading phase, new orders can be entered and existing orders can be modified or deleted. New order entries are taken into consideration in the respective trading form on the following trading day depending on possible validity constraints. It is also possible to modify trade attributes in the post-trading phase. Any trade attributes which are not subject to the counterparty's approval (e.g. settlement account, member internal order number, text, account identification etc.) may be modified. The trader can replace the settlement account of a specific trade using one of the remaining 15 settlement accounts of the relevant member during the same business day. If a settlement account is modified, a new trade confirmation will be forwarded to both counterparties.

Specialist/Market Maker quotes cannot be entered during the post-trading phase and will be deleted by the system during the end of day processing.

In this phase the order book is closed. Neither market participants nor the Specialist/Market Maker receive an overview of the market situation. Only the last price fixed of the current day is displayed.

7 Trading Models

The market model "Continuous Auction" contains two trading models, 'Continuous Auction with Market Maker' and 'Continuous Auction with Specialist'.

7.1 Continuous Auction with Market Maker

In 'Continuous Auction with Market Maker' all order sizes can be traded which have a determined minimum lot size for the specific security. In each case, only the minimum lot size can be traded or any integer multiple thereof. The minimum lot size may be one so that any integer multiple thereof is tradable. By taking into consideration all existing orders at the time of the auction as well as the Market Maker quote of an instrument, the auction will concentrate liquidity. The auction price will be determined pursuant to the modified principle of highest executable volume within or exactly at the bid or ask limit of the Market Maker quote. Orders will be executed according to the price/time priority (taking into account the Market Maker quote).

An auction in the trading model 'Continuous Auction with Market Maker' consists of a pre-call phase, an optional call phase and the price determination. The optional call phase is applied to avoid partial order executions and supports stop order processing.

The main trading phase consists of succeeding auctions. The number of succeeding auctions as well as the time between auctions or the duration of the pre-call phase respectively is substantially determined by the Market Maker, i.e. the quality of the quotes (provided quote volume and spreads) and the reaction time during the call phase. Furthermore the defined maximum duration of the call phase and the order book liquidity are relevant.

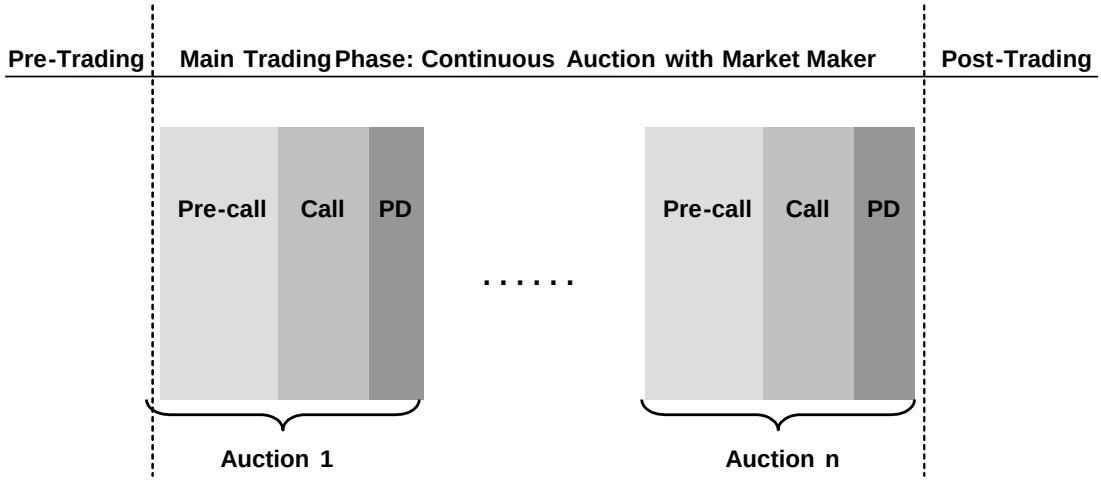


Figure 2: Change of trading phases – Continuous auction with Market Maker

7.1.1 Pre-Call Phase

During the pre-call phase orders may be entered, modified or deleted by market participants or the Market Maker. Besides, the Market Maker may enter or delete quotes pursuant to the Rules and Regulations.

During this pre-call phase the order book is open with a depth of 1, thus displaying all limit and market orders as well as the quote with the accumulated volumes of the best bid and best ask limit and the number of orders in the book at these limits. Market participants and Market Makers receive the same information.

From the pre-call phase a price determination or a phase change to the call phase is possible.

In general for a phase change from pre-call to price determination a Market Maker quote is required. A price will be determined immediately, if there is an executable order book situation in terms of a crossed order book within the spread of the Market Maker quote, or without generating a partial execution of an order executable at the Market Maker quote. These orders will be executed according to price/time priority within or at the spread of the Market Maker quote. If the Market Maker quote is based on indicative quotes rather than standard quotes, a price will not be determined immediately. Instead, a phase change from pre-call to call is triggered.

A phase change from pre-call to call is triggered by a potential executable order book situation (i.e. a market order or a crossed order book situation without an available Market Maker quote) or if the volume of the executable orders at the Market Maker quote exceeds the quote volume (including the volume of executable opposing orders) or a stop limit is reached by the Market Maker quote. (In case of a stop loss order, if the stop limit equals or exceeds the bid limit of the Market Maker quote. In case of a stop buy order, if the stop limit is equal or below the ask limit of the Market Maker quote.)

There is no maximum duration for the pre-call phase defined. If there is no order in a specific instrument the pre-call phase will not change during the complete main trading phase.

7.1.2 Call Phase

During the call phase orders may be entered, modified or deleted by market participants or the Market Maker. Besides, the Market Maker may enter or delete quotes pursuant to the Rules and Regulations.

During the auction's call phase, the order book is partially closed. Only the Market Maker quote is displayed. In case of an executable order book only the potential executable volume for the indicative auction price is displayed to the respective Market Maker. The indicative auction price is published neither to the Market Maker nor to the market.

The duration of the call phase has no predetermined minimum period and can be varied depending on the reaction time of the Market Maker and the instruments liquidity. The call phase has a maximum period and no random end (but might be terminated by the respective Market Maker before the end of the maximum duration).

From the call phase a price determination or a phase change to the pre-call phase is possible.

In general for a phase change from call to price determination a Market Maker quote is required. A price will be determined if a matching quote has been entered and an executable order book situation exists, the defined maximum duration of the call phase has passed or a full execution of the executable orders is possible.

A phase change from call to pre-call takes place if there is no executable order book situation anymore due to order modifications or a quote update or because of the deletion of the existing Market Maker quote during the call phase.

7.1.3 Price Determination

Price determination takes place if the order book is crossed within the Market Maker quote or at the bid or ask limit of this quote based on the fixed order book situation at the end of the pre-call or call phase. If the Market Maker quote is based on indicative quotes, matching against the bid or ask limit of this quote is not possible at the end of the pre-call phase. The Market Maker quote and all orders, which are in the order book at the time of price determination, are considered in the price determination. Price determination follows the modified principle of highest executable volume: the auction price is the price with the highest executable order volume and the lowest surplus for each limit within the current Market Maker quote (including the bid and ask limit of the quote). Price/time priority ensures that a maximum of one order is executed only partially. Further criteria for determination of the auction price are considered if the order book situation is not clear, that is if there is more than one limit with the same executable volume (see: chapter 9 Price Determination Process). After price determination any remaining parts of the Market Maker's quote are not deleted.

The market participants are informed about trades by way of an execution confirmation which contains the price, the volume and the time of execution. The execution confirmation is followed by a trade confirmation providing participants with all the trade data. Trades of the current trading day can be modified; in this case the participants will receive an updated trade confirmation.

7.2 Continuous Auction with Specialist

In general, the trading model ‘Continuous Auction with Specialist’ equals the trading model ‘Continuous Auction with Market Maker’. The differences are based on the role of the Specialist. There are differences especially in the transparency, the workflow of an auction and special functionalities.

In ‘Continuous Auction with Specialist’ all order sizes can be traded which have a determined minimum lot size for the specific security. In each case, only the minimum lot size can be traded or any integer multiple thereof. The minimum lot size may be one so that any integer multiple thereof is tradable. Orders will be executed according to the price/time priority.

An auction in the trading model ’Continuous Auction with Specialist’ consists of a pre-call phase, a freeze phase and the price determination. The freeze phase supports the Specialist to provide liquidity in the instruments he is assigned to.

The Specialist is obliged to use an adequate Limit Control System (LCS), which immediately displays executable orders including stop orders.

The main trading phase consists of succeeding auctions. The number of succeeding auctions as well as the time between auctions or the duration of the pre-call phase respectively as well as the duration of the freeze phase is substantially determined by the Specialist, i.e. the quality of the quotes (provided quote volume and spreads) and the reaction time during the pre-call phase and the freeze phase. Furthermore the defined maximum duration of the freeze phase and the order book liquidity are relevant.

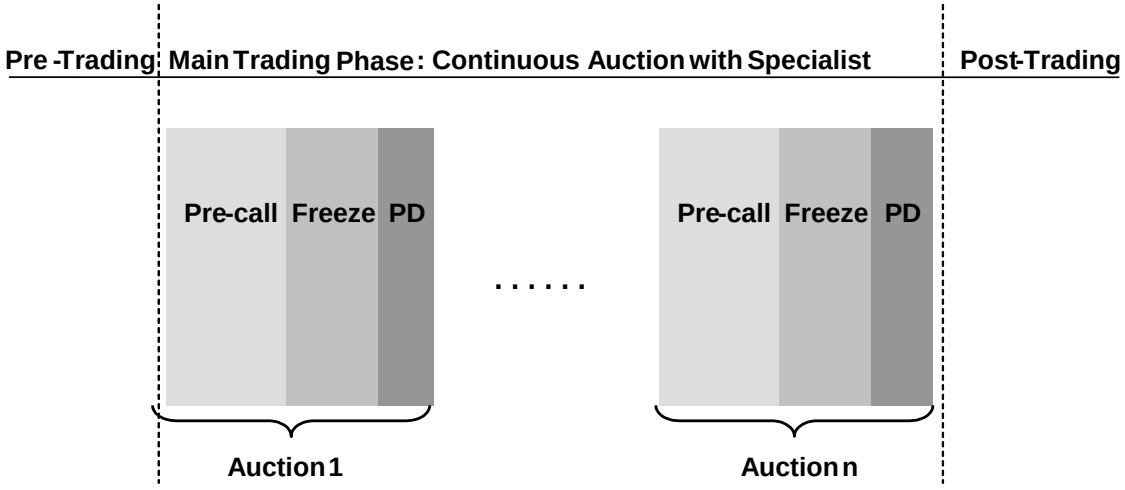


Figure 3: Change of trading phases – Continuous Auction with Specialist

7.2.1 Pre-Call Phase

During the pre-call phase orders may be entered, modified, or deleted by market participants. Additionally, quote requests can be entered. The Specialist is able to enter, modify, or delete orders on own behalf. In addition the Specialist is able to enter orders on behalf of other trading participants. These orders can also be deleted by the Specialist. Besides, the Specialist may enter, modify, or delete quotes pursuant to the Rules and Regulations.

During this pre-call phase the order book is fully open for the Specialist only, i.e. the Specialist is able to see each order and quote request as well as its originator. For market participants the order book is partially closed, i.e. only the Specialist quote is displayed.

From the pre-call phase only a change to the freeze phase is possible. This phase change is triggered by the respective Specialist.
There is no maximum duration for the pre-call phase defined. If there is no trigger by the respective Specialist in a specific instrument the pre-call phase will not change during the whole trading day (i.e. main trading phase).

7.2.2 Freeze Phase

During the freeze phase the order book is locked. In general market participants can not enter, modify, or delete orders in the order book. Such instructions are stored and enter the order book immediately after it gets unlocked by the Specialist without a price determination or with a price determination. An exception are orders submitted upon a quote response. In case the Specialist is not able to execute those orders within a dedicated time frame the order is deleted automatically even if the order book is locked or the order is in the locked stock.

In the freeze phase the Specialist is able to enter, modify, or delete orders on own behalf. In addition the Specialist is able to enter orders on behalf of other market participants. These orders can also be deleted by the Specialist. Besides, the Specialist may enter, modify, or delete quotes pursuant to the Rules and Regulations.

During the auction's freeze phase the order book transparency for market participants is equal to the transparency of the pre-call phase, i.e. partially closed. In addition to the order book transparency in the pre-call phase the Specialist can receive the potentially executable volume at the indicative auction price, e.g. by his LCS.

The duration of the freeze phase has no predetermined minimum period and can vary depending on the reaction time of the Specialist. The freeze phase has a maximum period and no random end (but might be terminated by the respective Specialists before the end of the maximum duration).

From the freeze phase a phase change to the price determination or to the pre-call phase is possible. In general a phase change from freeze to pre-call is triggered by the respective Specialist. If there is no trigger by the Specialist during the maximum period of the freeze phase, the system will automatically switch to the pre-call phase without a price determination. The change from freeze to price determination will be triggered by the Specialist by entering a matching quote.

A phase change from freeze to pre-call will not delete the current Specialist quote.

7.2.3 Price Determination

The price determination takes place after a matching quote entry of the respective Specialist. The price is determined by the trading system. The matching quote and all orders, which are in the order book at the time of price determination, are considered in the price determination. Price determination follows the modified principle of highest executable volume: the auction price is the price with the highest executable order volume and the lowest surplus for each limit within the current Specialist matching quote (including the bid and ask limit of the quote). Price/time priority ensures that a maximum of one order is executed partially. Further criteria for determination of the auction price are considered if the order book situation is not clear, that is if there is more than one limit with the same executable volume (see: chapter 9 Price Determination Process). After price determination any remaining parts of the Specialist quote are deleted.

The market participants are informed about trades by way of an execution confirmation which contains the price, the volume and the time of execution. The execution confirmation is followed by a trade confirmation providing participants with all the trade data. Trades of the current trading day can be modified; in this case the participants will receive an updated trade confirmation.

7.3 Trading of Subscriptions Rights

Trading of subscription rights takes place in trading model "Continuous Auction with Specialist". In this trading model, no specific minimum order size exists for trading of subscription rights.

Trading of subscription rights can take place in one auction per day within a predefined time period or in continuous auctions during the trading day with one special auction per day. All non-executed or only partially executed orders in the order book on the evening of a subscription right's penultimate trading day are deleted automatically. If desired, they have to be re-entered by the Trading Member on the next (last) trading day.

For subscription rights that are traded in continuous auction with one special auction per day, the first price determination on the first trading day as well as the last price determination on the last trading day takes place in a special auction.

7.4 Special Auction

For specific securities determined by the Exchange the Specialist has to conduct one "special auction" per trading day. In this auction besides unrestricted orders also order with the trading restriction 'special auction' are considered for price determination.

A special auction is not conducted at fixed point in time, but will be triggered by the Specialist within a time period set by the Exchange. The price determined in the special auction is flagged accordingly.

7.5 OTC Trade Entry

During the entire trading day (pre-trading, main trading and post-trading phase), all participants have the possibility to enter OTC trades in the trading system. In principle, entry is possible for all securities which are part of the exchange trading at FWB on the trading system Xetra. For the use of this function, a trader's admission is not necessary.

Entered OTC trades must be approved by the counterparty. This can be done manually or automatically. Subsequently, both counterparties receive a trading confirmation generated by the system. Unconfirmed trades are automatically deleted by the system at the end of the trading day. The trading system transmits the confirmed OTC trades to the settlement systems for the evening processing.

8 Tasks and Duties of the Specialist / Market Maker

8.1 Specialist's Tasks and Duties

In the trading model Continuous Auction with Specialist the Specialist is responsible for a high trading quality. The following general duties result from this task:

1. The Specialist is obliged to maintain a limit control system which scrutinizes all valid orders (incl. stop orders) in the order book for potential execution. In addition the Specialist is obliged to maintain a system that allows for the entry of quotes relevant for information purposes and for price determination of the trading system.
2. If reference markets are defined the Specialist shall receive real time order book information from these reference markets (if available).
3. The Specialist is obligated to provide quotes for information purposes throughout the trading day. For the quotation the current order book situation and if defined the respective reference markets have to be taken into account. If defined the Specialist must quote for at least a minimum guarantee size and with a maximum spread in all assigned instruments.
4. The Specialist shall respond to quote requests in due time.
5. The Specialists shall avoid, to the greatest possible extent, partial executions of orders that have been placed to them.
6. The Specialist might be obliged to offer additional liquidity to ensure a high trading quality.
7. In specific securities determined by the Exchange, the Specialist has to ensure that per security only one price determination by the trading system takes place per trading day. In these securities, the Specialist is only obliged to enter a standard quote within an adequate time period prior to the price determination.
8. In specific securities determined by the Exchange, the Specialist has to trigger a special auction once per day.
9. If there has not been a price determination for an instrument until a pre-defined point in time during the trading day the Specialist shall initiate a price determination for generating a price without turnover.

The stated Specialist's duties will be outlined more precisely and complemented in the Rules and Regulations of the Frankfurt Stock Exchange or in separate contracts.

8.2 Market Maker's Tasks and Duties

In the trading model Continuous Auction with Market Maker it is the task of the Market Maker to supply the market with the central liquidity for this security. The following duties result from this task:

1. The Market Maker continuously provides information of the actual market situation by entering a quote. Such a quote must have at least the minimum quote volume and a maximum spread for the respective instrument if such requirements are defined.
2. In case of a potential executable order book situation (i.e. a market order or a crossed order book situation without an available Market Maker quote) or if the volume of the executable orders at the Market Maker quote exceeds the quote volume (including the volume of executable opposing orders) or a stop limit is reached by the Market Maker quote, the Market Maker will receive an electronic message to enter a matching quote. This matching quote should correspond to the quote entered earlier and should fulfil requirements for the minimum quote volume and the maximum spread, if defined.
3. If there has not been a price determination for an instrument until a pre-defined point in time during the trading day the Market Maker shall initiate a price determination for generating a price without turnover.

The stated Market Maker's duties will be outlined more precisely and completely in the Rules and Regulations of the Frankfurt Stock Exchange or in separate contracts.

9 Price Determination Process

9.1 Basic Matching Rules

The auction price is determined on the basis of the Market Maker/Specialist quote and the order book situation stipulated at the end of the call/freeze phase.

The fundamental rules of calculating the auction price by the trading system according to modified principle of highest executable volume is explained below:

The auction price is the price with the highest executable order volume and the lowest surplus for each limit in the order book within the price range set by the Specialist/Market Maker quote (see example 1).

Should this procedure identify more than one limit within the price range (including bid and ask limits of the Specialist/Market Maker quote) with the highest executable order volume and the lowest surplus, the auction price will be determined on the basis of the surplus:

- If the surplus for all limits lies within the price range (including bid and ask limits of the Specialist/Market Maker quote) on the buy side (surplus of demand) the auction price is calculated according to the highest limit (see examples 2 and 6).
- If the surplus for all limits lies within the price range (including bid and ask limits of the Specialist/Market Maker quote) on the sell side (surplus of supply) the auction price is calculated according to the lowest limit (see examples 3 and 7).

If consideration of the surplus does not lead to a clear auction price, the midpoint of the possible prices is included as additional criterion. This may be the case if there is for several limits no surplus on hand (see examples 4 and 8) or if there is an equal surplus on the bid and the ask side (see examples 9).

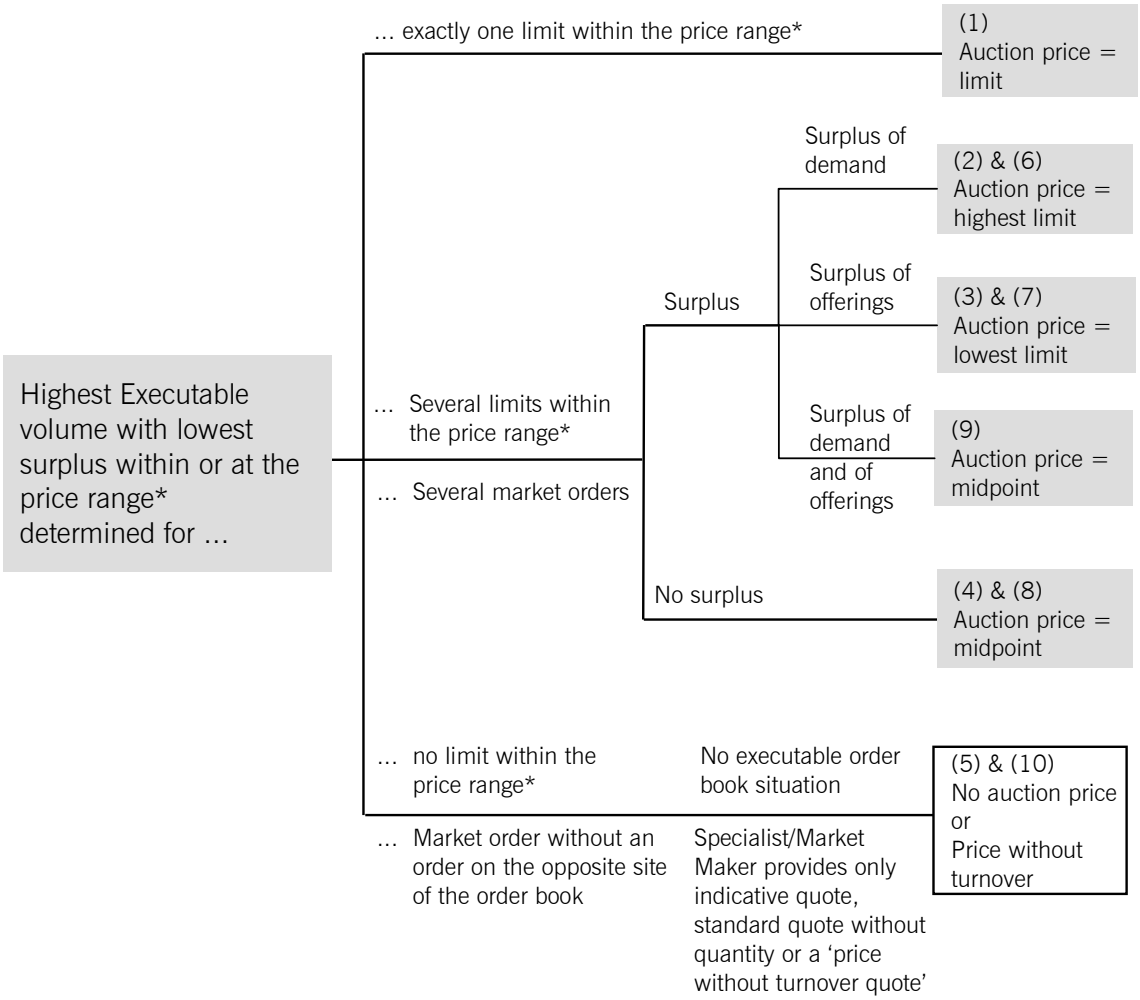
- The midpoint is calculated as the midpoint of the possible highest and lowest price and serves as auction price.

If orders within the price range (including bid and ask limits of the Specialist/Market Maker quote) cannot be matched, an auction price with turnover cannot be determined (see example 5).

Prices without turnover

If there has not been a price determination for an instrument until a pre-defined point in time during the trading day the Specialist/Market Maker shall initiate a price determination for generating a price without turnover.
Such a price determination will be triggered by entering a respective quote (price without turnover quote). If there is no executable order in the order book a price without turnover based on the bid side of the quote will be determined.

The following diagram gives an outline of how price determination rules affect possible order book constellations in continuous auction. The number in brackets refers to the corresponding example for this rule.



* Specialist/Market Maker quote with or without quantity. Bid and ask limit of the Specialist/Market Maker quote have to be included.

Figure 4: Rules for calculation of the auction price

9.2 Examples for determination of the auction price

The following examples are meant to clarify the calculation of the auction price. Therefore it is always an integer auction price.

Example 1: There is exactly one limit at which the highest order volume can be executed and which has the lowest surplus.

Bid								**Ask**
	Quantity	Cum. quantity	Surplus	Limit	Surplus	Cum. quantity	Quantity	
				202	800	800		
				201	800	800		
Limit	300	300		200	500	800	100	Quote
Limit	200	500		199	200	700		
Limit	300	800	100	198		700	300	Limit
		800	400	197		400	400	Limit
Quote	100	900	900	196				

An auction price at a limit of € 198 with a quantity of 700 and a surplus of 100 on bid side is calculated.

Example 2: There are several possible limits and there is a surplus of demand.

Bid								**Ask**
	Quantity	Cum. quantity	Surplus	Limit	Surplus	Cum. quantity	Quantity	
				202	900	900		
				201	900	900	400	Quote
Limit	600	600	100	200		500		
		600	100	199		500	100	Limit
		600	200	198		400	100	Limit
Quote	200	800	500	197		300	300	Limit

An auction price corresponding to the highest limit at € 200 with a quantity of 500 and surplus of 100 on bid side is calculated.

Example 3: There are several possible limits and there is a surplus of supply.

Bid								**Ask**
	Quantity	Cum. quantity	Surplus	Limit	Surplus	Cum. quantity	Quantity	
Limit	300	300		202	500	800		
Limit	100	400		201	400	800	200	Quote
		400		200	200	600		
Limit	100	500		199	100	600		
		500		198	100	600	600	Limit
Quote	400	900	900	197				

An auction price corresponding to the lowest limit at € 198 with a quantity of 500 and surplus of 100 on ask side is calculated.

Example 4: There are several possible limits and no surplus on hand.

Bid								**Ask**
	Quantity	Cum. quantity	Surplus	Limit	Surplus	Cum. quantity	Quantity	
				203	600	600	100	Quote
Limit	300	300		202	200	500		
Limit	200	500		201		500		
		500		200		500		
		500		199		500	300	Limit
		500	300	198		200	200	Limit
Quote	100	600	600	197				

An auction price corresponding to the midpoint of the possible prices is calculated at € 200 ((199 + 201)/2) with a quantity of 500.

Example 5: There is no possible limit.

Bid								**Ask**
	Quantity	Cum. quantity	Surplus	Limit	Surplus	Cum. quantity	Quantity	
				202	500	500	300	Quote
				201	200	200	200	Limit
Limit	100	100	100	200				
Quote	300	400	400	199				

It is not possible to determine an auction price.

Example 6: Only market orders are executable in the order book with a surplus of demand. Specialist/Market Maker offers no additional liquidity.

Bid								**Ask**
	Quantity	Cum. quantity	Surplus	Limit	Surplus	Cum. quantity	Quantity	
Market	200	200	100	Market		100		
		200	100	202		100	0	Quote
		200	100	201		100		
		200	100	200		100		
Quote	0	200	100	199		100		
		200	100	Market		100	100	Market

The auction price is calculated corresponding to the limit of the Specialist/Market Maker quote on the ask side with € 202, a quantity of 100 and a surplus of 100 on the bid side.

Example 7: Only market orders are executable in the order book with a surplus of supply. Specialist/Market Maker offers no additional liquidity.

Bid								**Ask**
	Quantity	Cum. quantity	Surplus	Limit	Surplus	Cum. quantity	Quantity	
Market	100	100		Market	100	200		
		100		202	100	200	0	Quote
		100		201	100	200		
		100		200	100	200		
Quote	0	100		199	100	200		
		100		Market	100	200	200	Market

The auction price is calculated corresponding to the limit of the Specialist/Market Maker quote on the bid side with € 199, a quantity of 100 and a surplus of 100 on the ask side.

Example 8: Only market orders are executable in the order book with no surplus. Specialist/Market Maker offers no additional liquidity.

Bid								**Ask**
	Quantity	Cum. quantity	Surplus	Limit	Surplus	Cum. quantity	Quantity	
Market	100	100		Market		100		
		100		202		100	0	Quote
		100		201		100		
		100		200		100		
Quote	0	100		199		100		
		100		Market		100	100	Market

An auction price corresponding to the midpoint of the possible prices is calculated at € 201 ((199 + 202)/2=200,5 rounded to the next tick size which is assumed to be 1€) with a quantity of 100.

Example 9: Orders are executable within or at the Specialist/Market Maker quote and an equal surplus on both sides. (Price determination between order limits)

Bid								**Ask**
	Quantity	Cum. quantity	Surplus	Limit	Surplus	Cum. quantity	Quantity	
				203	1.200	1.200		
Limit	100	100		202	1.100	1.200	1.000	Quote
		100		201	100	200	100	Limit
		100		200		100		
Limit	100	200	100	199		100		
Quote	1.000	1.200	1.100	198		100	100	Limit

An auction price corresponding to the midpoint of the possible prices is calculated at € 200 ((199 + 201)/2) with a quantity of 100.

Example 10: There are no executable orders in the order book. Specialist/Market Maker enters a price-without-turnover-quote (pwt-quote).

Bid								**Ask**
	Quantity	Cum. quantity	Surplus	Limit	Surplus	Cum. quantity	Quantity	
				202			0	Quote
				201				
Quote	0			200				

An auction price corresponding to the bid limit of the pwt-quote is calculated at € 200 with a quantity of 0.