

T7 Release 15.0

Functional Reference

– Part 1 –

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1. Introduction

T7 is the trading architecture developed by Deutsche Börse Group. It is a multi-exchange trading system that is used by the following exchanges for derivatives trading:

- Eurex
- European Energy Exchange (EEX)
- Nodal Exchange

and by the following exchanges for cash trading:

- Frankfurt Stock Exchange (trading venues Deutsche Börse Xetra and Deutsche Börse Frankfurt, in short: Xetra and Frankfurt)
- Düsseldorf Stock Exchange (DUS)
- Hamburg Stock Exchange (HAM)
- Hannover Stock Exchange (HAN)
- Munich Stock Exchange (MUC) for OTC Trade Uploads
- Vienna Stock Exchange (WBAG) with its partner exchanges:
 - Budapest Stock Exchange (BSE)
 - Prague Stock Exchange (PSE)
 - Ljubljana Stock Exchange (LJSE)
 - Zagreb Stock Exchange (ZSE)
- Malta Stock Exchange (MSE)
- Bulgarian Stock Exchange (BSE)

The trading system T7 offers a wide range of trading functionalities, both for on-book trading and for off-book trading. It is highly configurable and can be adapted to the needs of individual markets, on any level, from the entire market down to individual instrument groups.

On the technical side, T7 provides an outstanding level of reliability and availability, and at the same time, it is characterized by a high throughput capacity and by low latency.

T7 is a pure trading system. Trades executed on this platform are forwarded to the clearing and settlement systems.

1.1 Content of this document

The document T7 Functional Reference describes the T7 system and is split into two parts:

- T7 Functional Reference Part 1:
 - Market structure
 - Trading states
 - Order and quote handling
 - Matching and trade management
 - Off-book trading
- T7 Functional Reference Part 2:
 - Complex instruments

The T7 Functional Reference is targeted at everyone who needs detailed information about the business functionality implemented in the trading system. It is addressed especially to traders who need detailed information about the processing on the exchange side, but also, for example, to designers of advanced trading front-end applications.

There is no information in this document on participant and user maintenance. For more information about this topic, please refer to the *T7 Participant and User Maintenance Manuals*.

Since T7 is a trading system without any clearing and settlement functionality, this document does not contain any information about clearing and settlement.

For detailed information about how to communicate with the system, please refer to the documentation on GUIs, trading interfaces, data interfaces and reports.

1.2 Usage Notes

This document describes the available business logic as implemented in the system. Not every business functionality is available for all products or even markets. Set up information which is related to specific exchanges or products has been added at various places in this document in blue color to inform readers of specific configurations that affect the availability of specific functionalities.

Even though care has been taken to represent the actual configuration settings at the time of publication, these configuration settings are subject to change. Especially the values of the configuration parameters given in various examples throughout this document; these should not be taken as actual values for these parameters.

Depending on the configuration parameter, its actual value can be found in one of the following places:

- In the contract specifications as published by the exchange.
- In the reference data stream of the T7 system.
- In the static reference data files available on the respective website:
 - For Eurex and EEX: www.eurex.com
 - For Deutsche Börse Xetra and Deutsche Börse Frankfurt:
cashmarket.deutsche-boerse.com
- In circulars and other news published by the exchange.

1.3 Further reading

The following documents provide additional information to complement the information that is contained in this document:

- General documentation:
 - *T7 Functional and Interface Overview*.
 - *T7 Enhanced Trading Interface (ETI) Manual*.
 - *T7 Market and Reference Data Interfaces Manual*.
 - *T7 Extended Market Data Service Manual*.
 - *T7 XML Report Reference Manual*.
 - *Common Report and Upload Engine User Guide*.

- Derivatives markets:
 - *T7 Participant and User Maintenance Manual, for Derivatives Markets.*
 - *T7 Trading + Admin GUI & Clearer GUI - User Manual, for Derivatives Markets.*

- Cash markets:
 - *T7 Participant and User Maintenance Manual, for Cash Markets.*
 - *T7 Trading + Admin GUI & Clearer GUI - User Manual, for Cash Markets.*
 - *Market Model Continuous Trading in connection with Auctions.*
 - *Market Model Continuous Auction.*

These and other documents providing information about T7 can be found on the above-mentioned web sites.

1.4 Abbreviations and Definitions

Abbreviation or Term	Definition
ARP	Advanced Risk Protection
AVD	Auction Volume Discovery order
BOC	Book-or-Cancel
BSE	Bulgarian Stock Exchange or Budapest Stock Exchange (one of the Vienna partner exchanges)
BTRF	Basket Total Return Futures
BU	Business Unit
CCP	Central Counter Party
CLIP	Client Liquidity Improvement Process, i.e., Eurex Improve
CM	Clearing Member, i.e., a participant with a specific Clearing Business Unit
DBAG	Deutsche Börse AG
DC market participant	Direct client, formerly known as non-clearing member NCM
DMA	Direct Market Access
ECAG	Eurex Clearing AG
EEX	European Energy Exchange
EMDI	T7 Enhanced price level aggregated Market Data Interface
EMDS	T7 Extended Market Data Service

Abbreviation or Term	Definition
Eurex EnLight	A selective request for quote service, to negotiate off-book transactions
EOBI	T7 Enhanced Order Book Market Data Interface
ETC	Exchange Traded Commodity
ETF	Exchange Traded Fund
ETI	Enhanced Trading Interface
ETN	Exchange Traded Note
ETRF	Equity Total Return Futures
FIA	Futures Industry Association
FIS	TRF Forward Implied Spread
FIX	Financial Information eXchange (Protocol)
Frankfurt	Frankfurt Stock Exchange's trading venue Deutsche Börse Frankfurt on T7
GUI	Graphical User Interface
IPS	Inter-product Spread
LP	Liquidity Provider
LS	Locked Stock
MDI	T7 netted price level aggregated Market Data Interface
MIC	Market Identifier Code, e.g. XEUR, XETR, XFRA, XVIE.
MSE	Malta Stock Exchange
Net Position (Buy or Sell)	The net position of the trading side is defined as the accumulated traded notional value of that trading side minus the accumulated traded notional value of the opposing side resulting from the execution of orders or quotes.
Nodal	Nodal Exchange
NOS	Non-Standard Options Strategies
NOVS	Non-Standard Options Volatility Strategies
OCO	One-cancels-the-other order
Off-book	Refers to trading functionality not involving the central order book
On-book	Refers to trading functionality of the central order book
OVS	(Standard) Options Volatility Strategies

Abbreviation or Term	Definition
PAG	Product Assignment Group
PLP	Passive Liquidity Protection
PWT	Price without turnover, e.g. PWT quote
QRS	Quote Request Solution
RDF	Reference Data File
RDI	Reference Data Interface
RDS	Reference Data System
RfQ	Request for Quote
SI	Settlement Institution
SMP	Self-match Prevention
SOS	Standard Options Strategies
SpA	Sponsored Access
SRQS	Selective Request for Quote Service; now Eurex EnLight
T7	Cash & Derivatives trading system developed by Deutsche Börse Group
TAM	Trade at market, in the context of TES trading in Total Return Futures
TES	T7 Entry Service
TRF	Total Return Futures
TSO	Trailing stop order
VWAP	Volume Weighted Average Price
WBAG	Wiener Börse AG
Xetra	Frankfurt Stock Exchange's trading venue Deutsche Börse Xetra on T7
Xetra EnLight	A selective request for quote service, to negotiate off-book transactions

2. Fundamental Concepts

This chapter introduces the fundamental concepts that define the structure of the markets and their participants in T7.

2.1 On-book Trading and Off-book Trading

T7 supports on-book trading as well as off-book trading. On-book trading is characterized by a central order book, into which buyers and sellers enter their orders and quotes, and by execution of these orders and quotes against each other, according to the rules as described in this document. On-book trading is anonymous, i.e., neither the owners of the orders on the book nor the counterparties of a trade are disclosed. For trades in non-CCP products, the counterparties are disclosed to each other in the trade confirmations. Anonymous market data, as e.g. best bid and ask prices as well as their respective aggregated bid and offer sizes, are made available in real time to the market participants.

On the other hand, off-book trading is the entering of pre-arranged trades. The price and quantity of an off-book trade is already agreed upon by the participants before the entry of the trade into the exchange system. Off-book trading on T7 is also referred to as T7 Entry Services (TES). In this document both terms, off-book trading and T7 Entry Service (TES) are used interchangeably. Additionally, with Eurex EnLight and Xetra EnLight, T7 offers the possibility to negotiate off-book trades outside the central order book.

2.2 Participant Structure

2.2.1 Overview

The participant hierarchy in T7 has three levels:

1. The member firm is called a Participant.
2. Different units of a participant, e.g. trading desks that trade independently from each other, are called Business Units.
3. A business unit has one or more Users, that represent individual people, typically traders, and each business unit has one or more Sessions. A Session is a permanently registered connection channel to the exchange. Any request that is sent to the exchange, e.g. the entry of an order, is always sent by a logged-on user through a connected session.

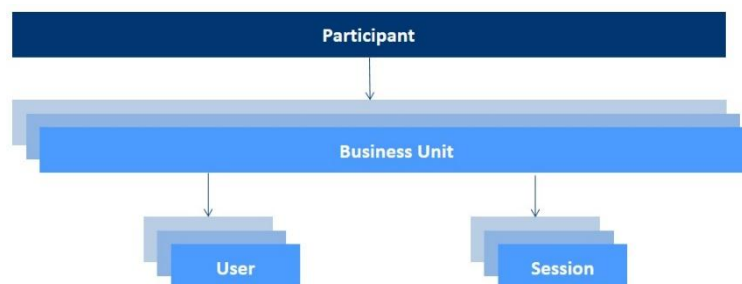


Figure 2-1: The participant hierarchy in T7

2.2.2 Participant and Business Unit

A member firm of the exchange is set up as a participant. The same member firm can have more than one participant. To trade in T7, a participant must have at least one Trading Business Unit set up. The business logic of T7 makes use of the business unit rather than of the participant.

If a participant wishes to have several trading desks that trade independently, it is possible to have several trading business units set up for the same participant. In T7, different trading business units trade completely independently from each other. For example, users from different trading business units cannot access each other's orders, quotes or off-book trades, even if these users belong to the same participant.

Set Up Information:

Currently, all exchanges on T7 allow only one trading business unit per exchange for each participant. Additional business units per participant may be made available at a later point in time.

However, the CCP trades of all business units of a participant are sent to the clearing house in the name of the participant. The clearing house does not distinguish between business units.

A Clearing Member of the exchange is a participant with a specific Clearing Business Unit that receives trade information for the trades of all own trading business units, as well as for the CCP trades of the trading business units of related DC market participants. Trade Information for non-CCP instruments is sent to the Clearing Member only, if it acts as Settlement Institute for the settlement of non-CCP trades. If another participant acts as Settlement Institute, the Clearing Member receives the trades in CCP-instruments only.

Clearing members as well as Service Providers that are not trading participants, but that have access to the system, are also set up as participants in T7.

2.2.3 User

A user is a person, such as a trader or administrator, or a machine, like an order routing system or a quote machine, that interacts with T7. Every request that reaches T7 must carry the identifier of an executing user, i.e., of a user who executes the request. Every order and every quote in T7 must carry the identifier of an owning user, which owns the order. Moreover, each side of a TES trade must carry the identifier of an approving user, who approves the TES trade and thus becomes the owner of one part of the TES trade.

Legal Note:

All exchanges require that for every active user in the system, there is a real person who assumes the legal responsibility for whatever is owned by the user, i.e., for the request, for the order or quote, or for the part of the TES trade.

Every user of T7 belongs to exactly one business unit.

The ownership of an order and thus the permission to modify or delete that order depends on who is the order's owning user. In general, the user who entered an order is the owning user of that order. See chapter 4.2 for details on the maintenance of orders.

A user may be given the user level of a Supervisor. A Supervisor User may modify or delete an order, if the owning user and the supervisor user belong to the same business unit.

Several users may be set up as belonging to the same Trader Group. One or several of these users may be given the user level Head Trader. A Head Trader User may modify or delete an order, if the owning user and the head trader user belong to the same trader group.

Example 2-1:

The user structure of business unit XYZFR is illustrated in figure 2-2. XYZFR has set up two trader groups but has also users without a trader group.

- In the trader group GRP1 there are the users A, B and C, of which only user A is given the user level Head Trader. User A can thus access orders that belong to users B and C, while users B and C can access only their own respective orders.
- In the trader group GRP2, all users D, E and F are given the user level Head Trader and can therefore access each other's orders.
- User G has the user level Supervisor and can thus access the orders of everyone in the business unit, independent of any trader groups.
- User H with the Head Trader level and user I with the normal Trader level do not belong to any trader group. Therefore, they cannot access each other's orders or the orders of anybody else. In addition, nobody can access their orders except for Supervisor user G. In fact, having the Head Trader level is meaningless for user H as long as user H does not belong to any trader group.



Figure 2-2: Illustration of the user structure of example business unit XYZFR as explained in the text.

Contrary to the case of orders, the owning user of a quote is only of legal relevance. The permission to modify or to delete a quote does in no way depend on the owning user or the owning user's trader group, and being a supervisor user or a head trader user is of no relevance for the maintenance of quotes. The permission to modify or delete a quote depends solely on the quote's owning session (for more details see chapter 2.2.4 Session).

A pending TES trade is owned by its initiating user, in general, the user that entered the TES trade. The initiating user of a TES trade is able to modify and delete the pending TES trade as a whole. Each side of a TES trade belongs to its respective Approving User, which can approve this side of the TES trade and become in this way the owner of that part of the trade. See chapter 9.2 for details on the maintenance of TES trades.

A supervisor user may delete pending TES trades of an initiating user belonging to the same business unit and approve TES trade sides of an approving user belonging to the same business unit.

A head trader user may delete pending TES Trades of an initiating user belonging to the same trader group and approve TES sides of an approving user belonging to the same trader group.

Only initiating users can modify a TES trade, which they previously initiated.

In the context of Eurex EnLight and Xetra EnLight, a T7 user plays the following functional roles:

- **Requester** – a user who sends a Request for Quote (RfQ) to the service and thereby starts the Negotiation Event. The requester is the owner of this Negotiation Event.
- **Respondent** – the target user of a Negotiation Event. The requester specifies the respondents in the RfQ to the service and thus grants the respondent role to one or more T7 users. The respondents own the quote they send in response to the Negotiation Event.

The ownership of the Negotiation Event and the order or quote sent to Eurex EnLight and Xetra EnLight is attached to a single user at a time. The deal in Eurex EnLight and Xetra EnLight has the owning requester and owning respondent user information.

The head trader user of a trader group may update the Negotiation Event, enter orders in Eurex EnLight and Xetra EnLight and cancel deals on-behalf of the requester belonging to the same trader group. The head trader user may enter, update, or delete quotes to the service and approve or reject deals in Eurex EnLight and Xetra EnLight on-behalf of the respondent belonging to the same trader group.

A supervisor user of a business unit may update the Negotiation Event, enter orders in Eurex EnLight and Xetra EnLight and cancel deals on-behalf of the requester belonging to the same business unit. The supervisor user can also enter, update, or delete quotes to the service and approve or reject deals on-behalf of the respondent belonging to the same business unit.

2.2.4 Session

A Session is a permanently registered connection channel to T7.

A session is set up for and belongs to exactly one business unit. To send requests to T7, a user must use a session that is connected to T7 and that belongs to the same business unit as the user. Besides that, there is no further relationship between users and sessions, i.e., a user does not belong to a specific session and a session does not belong to a specific user.

The ownership of a quote depends entirely on the quote's owning session. The owning session of a quote is the session through which the quote had been entered. A session can only have one Retail Liquidity Provider (RLP) quote and one non-RLP quote per instrument, and the entry of a new quote results in the replacement of the quote that belonged to the same session, RLP quote or non-RLP quote respectively. See chapter 5.3 and 5.4 for details on the ownership and the maintenance of quotes.

Also, orders know the concept of the owning session. While permissions to maintain orders depend mainly on the owning user, there are some restrictions with respect to the owning session as well. They are described in chapter 4.2.5 on order ownership.

The concept of the owning session does not apply to TES trades. Initiating users and approving users may use any (low frequency) sessions that belong to their respective business unit. Similarly, Eurex EnLight and Xetra EnLight support only low frequency sessions and the concept of owning session does not apply.

2.2.5 Sponsored Access

Each participant can offer a Sponsored Access (SpA) to indirect participants to trade on T7. The participant offering SpA access is called *SpA Provider*, the indirect participant is called *SpA User Company*. The users of the SpA User Company are called *SpA Traders*.

A SpA Provider can have several independent SpA User Companies, and a SpA User Company can be registered at several SpA Providers using different SpA User Company IDs.

For each SpA User Company, a so-called *SpA Unit* for the SpA Traders can be created under the business unit of the corresponding SpA Provider. Dedicated SpA sessions (ETI HF and LF and FIX LF back office) are assigned to the SpA User Companies. There is a special Sponsored Access Trader role for the SpA Traders.

Each SpA Provider is responsible for the trading activity and the risk monitoring of each of its SpA User Companies. A SpA Provider can set and maintain the pre-trade risk limits for its SpA User Companies. The trading activity of PTRL user risk groups can be suspended by the SpA Provider. Also a validation for the Maximum Order Value (MOV) can be enabled for the respective SpA User Companies.

An order drop copy service covering both standard and lean orders is provided by the Enhanced Drop Copy (EDC) interface for the SpA Provider to monitor his SpA User Companies via EDC sessions assigned to the SpA User Companies.

In case such an EDC session is configured with the option to halt trading, it is referred to as an *EDC monitoring session*. Once EDC monitoring sessions are set up, i.e., with the option to halt trading, and linked to a SpA User Company, at least one of these EDC monitoring sessions has to be connected, otherwise trading is halted for the associated SpA User Company. In case the last connected such EDC monitoring session referring to a specific SpA User Company is disconnected, an automated trading action request to halt the trading activity is triggered deleting all non-persistent (and in cash markets also all persistent) orders entered via the corresponding SpA User Company trading session.

Please note that SpA Providers are not obligated to set up EDC monitoring sessions; it is possible to monitor the trading activities via EDC sessions without the option to halt trading.

SpA Providers can explicitly halt all trading activities of a SpA User Company and optionally delete all its orders (Kill Switch). SpA Providers can put ISINs on a restricted list to restrict the trading for its User Companies.

With the Overall Risk Limits (ORL), there is a specific risk protection mechanism for Sponsored Access in cash markets, see chapter 14.3.

Set Up Information:

Sponsored Access is available for Eurex and Xetra.

TES trading is supported by SpA in Eurex but not in Xetra.

SpA on Xetra is available only for the trading model Continuous Trading with Auctions and only for the Trading Capacities Agency and Riskless Principal. If a Preferred CCP setup is configured, trades are routed to the Clearing member and Central Counterparty according to the same rules. The Restricted List of ISINs is available only in Xetra.

2.3 Market Structure

2.3.1 Markets

In T7, an exchange with its own trading rules, its own products and its own control entity is typically represented as a Market. This is however a technical choice, and it is possible to have several exchanges being set up together in one market. T7 is able to operate multiple such markets in parallel on one technical system. Each product and thus each instrument belong to a specific market.

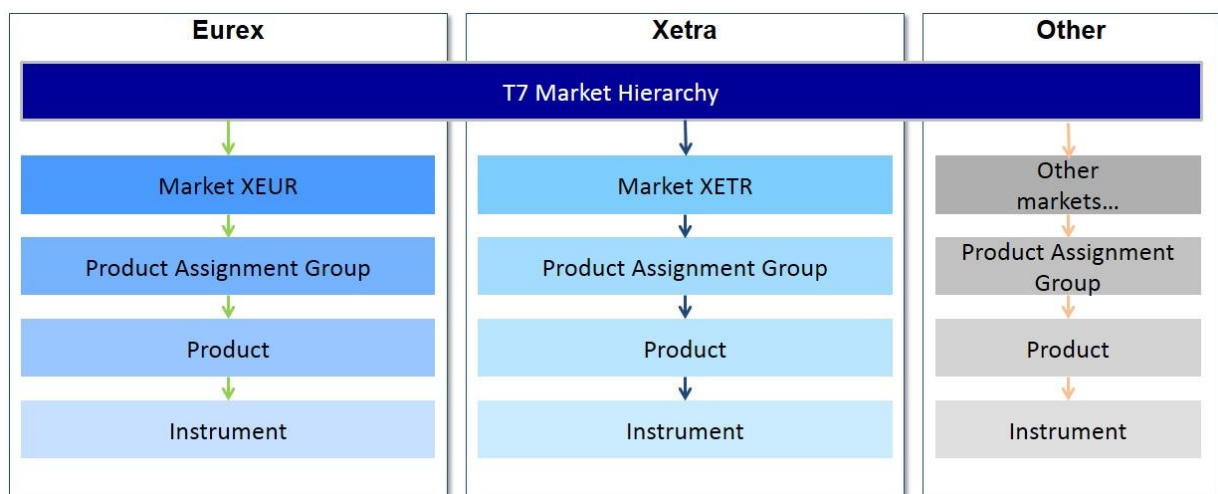


Figure 2-3: The market hierarchy in T7

The product assignment groups are used for Entitlement except for Deutsche Börse Frankfurt. Each product assignment group refers to a specific market.

In general, exchange participants are considered as exchange specific. Nevertheless, T7 does not technically restrict a participant to one specific market. Instead, it allows exchanges to grant participants and individual users access to their products, independent of the participants' exchange membership.

For details concerning the handling of participants' and users' access to products, please refer to the document *T7 Participant and User Maintenance Manual, for Derivatives respectively for Cash*.

Set Up Information:

Eurex, Xetra, EEX, BSE, MSE, and WBAG with its partner exchanges are hosted on the same physical T7 system, each being set up as an own market with its own products. Participants are either Eurex members, Xetra-, EEX-, BSE-, MSE-, WBAG- or WBAG partner exchanges members.

The trading venue Deutsche Börse Frankfurt is hosted on a separate physical T7 system. The exchanges Düsseldorf, Hamburg and Hannover are hosted on the same physical T7 system, each with its own market, with its own products, and with its own exchange participants.

OTC Trade Uploads for Frankfurt, Düsseldorf, Hamburg, Hannover, and Munich are also available on Deutsche Börse Frankfurt.

2.3.2 Products and Instruments

In T7, trading is organized into Instruments and Products, whereby Instruments are the tradable entities, i.e., an order always refers to buying or selling a specified quantity of a certain Instrument.

Instruments of the same type can be grouped together to form Products. However, every tradable instrument must belong to a product.

If an ISIN is traded in two or more different currencies, this results in two or more different instruments. These instruments are grouped in one product.

Example 2-2:

An example for an instrument on the EUREX exchange is FDAX Mar20, which is the futures contract on the DAX index with contract date March 2020. A trader that wants to buy 20 contracts of this futures contract, places a buy order with a quantity of 20 in the instrument FDAX Mar20.

A futures product normally contains all futures instruments for the same underlying that differ only in the contract date. An options product normally contains all Call options instruments and all Put options instruments that differ only in the contract date, the strike price or the version number.

An example for an instrument traded on Xetra is DBXD, which is an exchange-traded fund that tracks the performance of the 30 companies listed in the DAX® share index. All exchange-traded funds with the DAX® share index as underlying are grouped to the DAX ETF product.

An example for a product traded on Frankfurt is WARBA_01, which contains warrants issued by Baader Bank.

Instruments of the same product are traded in the same way, i.e., trading parameters and trading schedules are defined for products or groups of products rather than for individual instruments.

On-book trading is controlled by Trading States. A product has a trading state, but also every instrument has its own individual trading state. Usually, all instruments of a product have the same trading state that depends first on the trading state of the product. Nevertheless, in special

circumstances, an individual instrument's state may differ from the states of the other instruments of the product.

Off-book trading is controlled on the product level by the TES Activity Status. The TES activity status of the product always applies to all the instruments belonging to the product.

See chapter 3 for information about trading states and the TES activity status.

2.3.3 Instrument Covers

Instrument covers ("Hüllen") can be listed by Issuers on T7 in the cash markets in the trading models *Continuous Auction with Specialist* and *Continuous Auction with Market Maker* as intraday or long-term covers, being identifiable via a dedicated reference data field *Cover Indicator*.

The *Cover Indicator* is a reference data attribute of all T7 cash instruments with the following valid values:

- No cover
- Intraday cover
- Long-term cover
- Activated cover

As long as the *Cover Indicator* points to an intraday or long-term cover, the instrument is not tradable in T7, but available in the reference data. Covers become tradable only and immediately upon the activation by the issuer, who is able to update certain instrument attributes denoted as *Adjustable Cover Attributes* with the activation. These are:

- Description
- Underlying
- Maturity Date
- Strike Price
- Coupon Rate
- First Trading Date
- Last Trading Date
- Start of Quoting Period
- End of Quoting Period

On activation of a cover instrument, the *Cover Indicator* is changed to *Activated* and the *First Trading Date* is set to the current business day. Trading participants are informed of the activation and changed instrument attributes via instrument reference data, and by market data about the instrument state change to *Pre-Call*. An activated cover will never be reverted to a cover.

An activation of a cover is only supported up to a certain point in time near the end of the trading day. Any activations after that point in time are queued for the next business day to ensure an appropriate processing in synchronization of all technical systems involved.

Set Up Information:

Covers are only used by structured products listed at Deutsche Börse Frankfurt.

2.3.4 Complex Instruments

Instruments that make up a product like equities, exchange-traded funds (ETF), futures contracts or options series are so-called Simple Instruments in order to distinguish them from Complex Instruments. A complex instrument is an instrument that facilitates the simultaneous trading of two or more simple instruments at a net price, with the guarantee that either all or none of the involved simple instruments get executed.

Being a typical feature of derivatives markets only, complex instruments do not exist in cash markets. The simple instruments that make up a complex instrument are referred to as the Leg Instruments of the complex instrument.

	Derivatives Market	Cash Market
Simple Instruments	Futures Contracts Option Series	Equities, Exchange Traded Funds, Exchange Traded Commodities, Exchange Traded Notes, Money Market Funds, Investment Funds, Bonds, Warrants, Subscription Rights, Covers
Complex Instruments	Futures Spreads Standard Futures Strategies Packs and Bundles Strips Commodity Strips Inter-Product Spreads Standard Options Strategies Non-Standard Options Strategies Options Volatility Strategies Non-Standard OVS TRF Strategies	-
Flexible Instruments	Flexible Futures, Flexible Options	-

Figure 2-4: The Instrument Types

T7 supports the following types of complex instruments:

- Futures Spreads are calendar spread combinations for futures.
- Packs and Bundles allow to simultaneously buy or sell all quarterly contracts of a futures product that expire in a time span of one or more years.
- Strips are similar to Packs and Bundles but allow a more flexible choice of leg instruments.
- Commodity Strips are focused on the trading of commodity products such as power futures.
- Standard Futures Strategies are multi-leg futures strategies that conform to a strategy type, which is pre-defined by the exchange.
- Inter-Product Spreads (IPS) are spreads between contracts of different futures products.
- Standard Options Strategies (SOS) are multi-leg options strategies that conform to a strategy type, which is pre-defined by the exchange.

- Non-standard Options Strategies (NOS) are multi-leg options strategies that are freely defined by the users.
- Standard Options Volatility Strategies (OVS) are strategies of a predefined type that combine one or more options series with the underlying, which is represented by a futures instrument.
- Non-Standard Options Volatility Strategies (NOVS) are more flexible by allowing a non-standard Options Strategy which is not covered by a strategy template of OVS.
- TRF Strategies are strategies that have at least one leg being a Total Return Futures instrument. Available subtypes include delta-neutral strategies and Forward Implied Spreads (FIS).

The Instrument Type distinguishes the various types of complex instruments from each other, from flexible instruments and from simple instruments. There are a number of functionalities for which instrument types play an important role. For example, a number of quoting functionalities like market maker protection work on a scope that encompasses all instruments that belong to the same product and instrument type.

Support of more types of complex instruments may be added in the future.

Not all complex instrument types are available for all products. The exchange enables or disables the support of the various complex instrument types on a product basis.

Before T7 accepts orders for a complex instrument, the complex instrument must be created. Some complex instruments are created by interested users by the way of sending corresponding creation requests to T7. However, there are also complex instruments, which are created automatically by the exchange.

Example 2-3:

The options strategy OGBL BUL Dec27 160.0 - 165.0 is defined as buying the OGBL Dec27 160.0 C series and simultaneously selling the same quantity of the OGBL Dec27 165.0 C series. The first user who wishes to trade this strategy has to create the complex instrument first, before being able to send an order for the strategy. The instrument type is Standard Options Strategy.

The spread FGBL SPD Sep27 Dec27 is defined as buying the FGBL Sep27 contract and simultaneously selling the same quantity of the FGBL Dec27 contract. The corresponding instrument has an instrument type of Futures Spread. It is automatically created by Eurex.

The specific behavior of complex instruments, especially the various complex instrument types and the ways they are created and traded, is explained in detail in the *T7 Functional Reference Part 2*.

2.3.5 Flexible Instruments

TES supports off-book trading of tailor-made futures and options contracts, which are called Flexible Instruments. Depending on configuration, flexible instruments can be created by users.

Being a typical feature of derivatives markets only, flexible instruments do not exist in cash markets.

Flexible instruments can be created in existing futures products by selecting:

- Flexible maturity – Participants of a flexible futures trade can create their own maturity date for the transaction.
- Settlement type – The settlement type can be cash settlement or physical delivery.

Flexible instruments can be created in existing options products by selecting:

- Exercise price – The exercise price can be defined by the creating user and can be even above the highest currently available exercise price or below the lowest currently available exercise price of the corresponding regular option series. While the selected exercise price may be as low as the lowest exercise price, which can be represented in the system, the maximum depends on configuration by the exchange.
- Expiration date – The expiration date of a flexible instrument does not need to be a standard expiration date of the respective product, but – with some special exchange-defined exceptions – it can be any trading day of the product.
- Exercise style – American-style (exercise on any exchange day during the lifetime of the option) or European-style (exercise only on the last trading day of the option) can be specified.
- Settlement type – The settlement type can be cash settlement or physical delivery.

For more information, see chapter *Flexible Instruments* in the *T7 Functional Reference Part 2*.

2.3.6 Scaled Instruments

Based on a simple instrument, users can create intraday new instruments which scale up the round lot size of the simple instrument. These instruments are called *Scaled instruments*. They can be created as simple or as complex instruments in derivatives markets.

For more information, see chapter *Scaled Instruments* in the *T7 Functional Reference Part 2*.

3. The Business Day

3.1 Overview

On T7, the business day for on-book and off-book trading can be structured independently. The on-book trading state concept provides a comprehensive range of product and instrument states for proper functioning of an order book. On the other hand, for off-book trading the TES activity status provides the simplicity to control the TES trading on product level.

3.2 Trading States

On-book trading on T7 is controlled in conjunction with the trading model by trading states. They control what activities are available to traders and what functions T7 performs during each period.

T7 has both Product States and Instrument States. While product states give a structure to the business day and control general access to the system, instrument states control order and quote maintenance and execution, and they control the availability of public market data.

3.2.1 Instrument States

Instrument states control

- If order and quote maintenance is possible and to what extent,
- What kind of order book information is published by the exchange,
- If orders and quotes are executed.

The following chapters describe each instrument state and instrument state transition in detail.

3.2.1.1 Instrument State Continuous

The instrument state Continuous is the state where continuous matching takes place. Price determination and matching take place immediately and without an auction.

In the instrument state Continuous

- Order maintenance is possible.
- Quote maintenance is possible.
- Public market data in price-level aggregated form for a limited number of price levels is published by the exchange. For instruments with synthetic matching, this includes synthetic price information about the best available price level.
- Price and quantity information about an order-by-order basis is published by the exchange for selected products.
- There is continuous matching of orders and quotes.
- Trade data is published by the exchange.

3.2.1.2 Instrument state Pre-Call

The instrument state Pre-Call serves as preliminary phase in the run-up to auction phases in *Continuous Auction* trading models.

Pre-Call in the *Continuous Auction with Market Maker* trading model:

- Immediate matching occurs only within the limits of a Liquidity Provider's quote, if the quote does not trigger Stop orders, and if no orders are partially matched. Otherwise, a change to instrument state Auction-Call is triggered.
Exception: If an instrument is sold-out and there is a crossed order book situation without any market maker quote (i.e. no Indicative, Standard, or Price-without-Turnover quote), then no phase change from Pre-Call to Call is triggered.
- Liquidity Provider quotes of all types (Standard, Indicative, Price-without-turnover, Matching), as well as Limit, Market, Stop, TSO and OCO orders can be entered. No order restrictions are allowed. Matching quotes are treated as Standard quotes.

Pre-Call in the *Continuous Auction with Specialist* trading model:

- No matching occurs in Pre-Call.
- Participants can enter orders, and the Specialist can enter standard and PWT quotes.
- Within the quoting periods, the Specialist may switch from the Pre-Call phase to the Freeze phase at any time.

For details on the sequence of instrument states in *Continuous Auction* trading models see chapters 3.2.4 and 3.2.5.

3.2.1.3 Instrument state Trade-at-Close

In cash markets, the instrument phase Trade-at-Close serves as a potential continuous trading phase after the closing auction in the trading model *Continuous Trading with Auctions*. Matching is possible only at the fixed closing auction price. During Trade-at-Close, no price discovery takes place.

An order participates in Trade-at-Close only, if the trader has previously flagged the order accordingly upon order entry. Quotes cannot participate in the Trade-at-Close phase; however, quotes can still be entered while the Trade-at-Close phase is active for the relevant instrument.

Eligible for Trade-at-Close are regular Market and Limit orders as well as BOC orders of any validity if the price limit is better or equal to the closing auction price. Therefore, when the Trade-at-Close flag is set, the only allowed order restriction is BOC, whereas any validity constraint valid for these order types, including IOC or FOK, is allowed. There is no extra order profile for regular and BOC orders flagged for Trade-at-Close.

Please note that when the Trade-at-Close flag is set to No and the closing auction was already committed, then orders that are submitted with a validity expiring on this trading day are rejected. No other restrictions are in place in case of the Trade-at-Close flag being set to No. E.g. Closing-Auction-Only orders can be entered with a Trade-at-Close flag set to No, if the validity is accordingly.

Stop orders are not triggered in Trade-at-Close and no volatility interruption occurs in Trade-at-Close.

Trades generated in the Trade-at-Close phase are flagged as such. Trade-at-Close is a transparent trading phase with both pre-trade transparency and post-trade transparency compliant with MiFID II / MiFIR requirements.

3.2.1.4 Auction Instrument States

There are several auction instrument states that represent the auction call phases of various types of auctions in various trading models. Most auction types are used in *Continuous Trading* whereas the auction type Auction-Call is used in *Continuous Auction with Market Maker* trading model:

- Opening Auction: An opening auction occurs once a day in the morning before continuous trading starts.
- Closing Auction: For some products, there is a closing auction, either at the end of the continuous trading phase, or during the day to determine an auction price as a basis for a settlement price. There can be only one closing auction per day.
- Volatility Auction: A volatility interruption results in a volatility auction. See chapter 7.6 for information about volatility interruptions.
- Intraday Auction: The intraday auction interrupts continuous trading. This occurs when a scheduled intraday auction is started or if under exceptional circumstances trading is halted and re-started during the day, in this case there is always an intraday auction before continuous trading resumes.
- Auction-Call: The auction phase in the *Continuous Auction with Market Maker* trading model.

Configuration Data:

The information, whether there is a closing auction for a product, is available in the Trading Parameters File for Eurex and EEX, which is part of the Products and Instruments Files on the Eurex website; and in the Trading Schedule (Assignment) Files for Deutsche Börse Xetra and Frankfurt, which are part of the Static Reference Data Files on the Cash Market website, see chapter 1.2 Usage Notes.

In an auction instrument state ...

- Order maintenance is possible.
- Quote maintenance is possible.
- Depending on the market model, only the top of book market data is published by the exchange, i.e., either the best buy and sell prices or the potential auction price¹.
- No trading occurs, but at the end of an auction instrument state, an order book uncrossing may occur, potentially resulting in an auction trade that is published by the exchange.

¹ Also called Indicative Auction Price. This document applies the term Potential Auction price.

For Closing Auction:

- Generally, orders being entered with a validity expiring on this trading day are rejected once the closing auction was committed. As an exception, when the Trade-at-Close flag is set to Yes, then orders with a validity expiring on this trading day are accepted during the Trade-at-Close phase although the closing auction was already committed.

For Auction-Call, additional special conditions are valid:

- Of orders, limit, market, and stop orders can be entered. No order restrictions are allowed.
- Of quotes, only Liquidity Provider matching quotes are allowed. A matching quote immediately ends the auction, and if possible, triggers matching.

Set Up Information:

For the Continuous Auction with Market Maker trading model in WBAG, market data in Auction-Call is provided with the full depth of the order book. For structured products listed at Deutsche Börse Frankfurt, the order book is closed to the market; quotes are disseminated via all market data interfaces including CEF without disclosing the quote type.

3.2.1.5 Freeze in trading models of type *Continuous Trading*

An auction freeze state in trading models of type *Continuous Trading* is a state where the exchange has frozen the market during an auction call phase, in order to control the order book situation. Like for the auction instrument states described above, for each type of auction, there is one auction freeze instrument state.

1. Opening Auction Freeze.
2. Closing Auction Freeze.
3. Volatility Auction Freeze.
4. Intraday Auction Freeze.

In an auction freeze state ...

- No order entry or modification is possible.
- No immediate order deletion is possible, but order deletion requests results in the order being marked as pending deletion (see below).
- Entry of new quotes is not possible.
- Requests to overwrite or modify an existing quote side are rejected, but at the same time induce T7 to set the existing quote side to pending deletion.
- No immediate quote deletion is possible, but quote deletion requests results in the quote being marked as pending deletion.
- No trading occurs, but at the end of an auction freeze instrument state, an order book uncrossing may occur, potentially resulting in an auction trade, which is published by the exchange.

During an auction freeze state, any activity that changes the order book is not possible. Nevertheless, a trader may send requests to delete orders or quotes in an auction freeze state. T7 does not delete

the orders or quotes immediately but rather mark them as pending deletion. Orders and quotes that are marked as pending deletion are automatically deleted by the system, once the instrument enters a different instrument state.

It is important to note that orders and quotes that are marked as pending deletion still participate in an auction trade that is done at the end of the auction freeze state. Therefore, sending a deletion request for an order or a quote during an auction freeze state does not prevent the order or quote from being matched in the auction trade that ends the auction freeze state. It only guarantees that any remainder of the order or quote is deleted right afterwards.

3.2.1.6 Freeze in Continuous Auction with Specialist trading model

The Freeze state in the *Continuous Auction with Specialist* trading model is an instrument state where the Specialist freezes the order book of an instrument in order to control the order book situation and to arrange matching:

- Participants can enter, modify, or delete their orders, but the requests are immediately moved to the Locked Stock and released and processed only after the end of the Freeze phase.
- The Specialist arranges the order book for price determination and triggers the price determination with a Matching Quote, thus leaving Freeze.
- Only top of book market data is published by the exchange, i.e., either the best buy and sell prices or the potential auction price.
- After Freeze the instrument state switches back to Pre-Call and the order requests in the Locked Stock are released. If the product has changed to Closing while the instrument was in Freeze, the subsequent instrument state is Book.

For details on the sequence of instrument states in *Continuous Auction* trading models see chapters 3.2.4 and 3.2.5. Concerning the Locked Stock handling in and after the Freeze phase, see chapter 3.2.5.1.

3.2.1.7 Instrument State Book

The instrument state Book is the state where traders can maintain their orders and quotes, but no matching takes place.

In the instrument state Book

- Order maintenance is possible.
- Quote maintenance is possible.
- No public market data is published by the exchange.
- No matching occurs.

3.2.1.8 Instrument State Restricted

The instrument state Restricted is a state where traders are only allowed to delete their orders.

In the instrument state Restricted

- No order entry and no order modification are possible, but order deletion is supported.
- No quote maintenance is possible and there are no quotes in the order book.
- No public market data is published by the exchange.

- No matching occurs.

T7 does not support the presence of quotes in the order book during the instrument state Restricted. Therefore, all quotes of an instrument are automatically deleted by T7 when the instrument enters the state Restricted.

Set Up Information:

For Eurex and EEX, instruments enter the state Restricted when the product is set to Halt.

3.2.1.9 Instrument State Closed

The instrument state Closed is the state where no access to the order book is available.

In the instrument state Closed:

- Maintenance of individual orders is not possible, but requests that require the deletion of all orders in a specified scope are still processed, provided that the product state allows access to the system at all.
- No quote maintenance is possible and there are no quotes in the order book.
- No public market data is published by the exchange.
- No matching occurs.

T7 does not support the presence of quotes in the order book during the instrument state Closed. Therefore, all quotes of an instrument are automatically deleted by the system when the instrument enters the state Closed.

Set Up Information:

For Xetra, Frankfurt, BSE, MSE, and WBAG with its partner exchanges, instruments enter the state Closed when the product is set to Halt.

3.2.1.10 Retail Pre-Call

The instrument state Retail Pre-Call serves as preceding phase in the run-up to Retail Call auctions in Retail Early and Late Trading phases.

Only Retail orders from Retail Member Organizations (RMO) and Retail quotes and orders from Retail Liquidity Providers (RLP) take part in the trading, for all instruments that participate in retail trading. For the handling of non-Retail orders and quotes in this phase see the product states Retail Early and Late Trading.

The instrument state will automatically switch from Retail Pre-Call to Retail Call when a crossed orderbook situation between RMO order(s) and RLP quote(s) and / or RLP order(s) occurs.

3.2.1.11 Retail Call

Retail Call is an auction instrument state entered from instrument state Retail Pre-Call. Only Retail orders and quotes take part in trading. For the handling of non-Retail orders and quotes in this phase see the product states Retail Early and Late Trading.

The termination of the Retail Call phase is time-triggered, with a random end.

The Retail Call auction price will be determined using the highest executable volume and the lowest surplus, within the spread of the best Retail quotes provided by the Retail Liquidity Providers. Trades

in the Retail Early and Late Trading phases will be flagged as Xetra Retail trades in the same way as Retail trades generated in the main trading hours.

Volatility Interruptions may occur.

3.2.2 Product States

Product states give a structure to the business day. They also control the general access to T7. In general, the instrument state changes with the product state. The following chapters describe each product state in detail.

3.2.2.1 Start of Day

The product state Start of Day represents the time in the morning before activity starts. Participants have no access to the order books in this product state. All instruments are in the instrument state Closed.

3.2.2.2 Pre-Trading

The product state Pre-Trading occurs in the morning before trading starts. It is typically a time where traders may maintain their orders prior to the start of trading. No matching occurs in this phase.

Normally, instruments are in the instrument state Book.

3.2.2.3 Retail Early Trading (optional)

After the Pre-Trading, and before the Opening Auction of the regular main trading phase, products can enter a Retail Early Trading phase, where instruments can be traded with Retail orders and quotes in instrument states Retail Pre-Call and Retail Call, i.e., a Retail Auction.

Non-Retail orders and quotes do not participate in trading in this product state, but they can be maintained as in Pre-Trading. Book-or-Cancel orders entered in the book in the main trading phase will be cancelled when entering Retail Early Trading. Any unexecuted Retail order entered by RMOs in the Retail Early Trading will stay in the book and will participate as a booked Retail order in the following main trading phase and also the Retail Late Trading phase, until its validity expires.

The Retail orderbook will be disseminated on all available T7 market data interfaces. Unlike in the main trading hours, the RLP quotes/orders entered during the Retail Early Trading phases will be disseminated to all the trading participants via T7 market data.

[Set Up Information:](#)

Available only for Deutsche Börse Xetra.

3.2.2.4 Trading

The product state Trading represents the trading phase.

For *Continuous Trading* trading models, the standard procedure for the product state Trading is that after an initial opening auction call phase, the instruments are in Continuous phase, possibly interrupted by intraday or auction freeze or volatility auction call phases.

In *Continuous Auction* trading models, the instruments are in Pre-Call, interrupted by Auction-Call or Freeze phases.

3.2.2.5 Closing

The product state Closing is a short phase that sits between the phases Trading and Post-Trading. It covers the time between the end of regular trading and the end of the last auction, typically a closing auction, respectively the end of Trade-at-Close in *Continuous Trading with Auctions* trading model.

In Closing, instruments are either in a (closing) auction or auction freeze instrument state, or in instrument state Trade-at-Close, or they are in the instrument state Book. During Trade-at-Close, no volatility interruption can occur.

The product state Closing ends automatically when there is no more running (closing) auction in any of the product's instruments, respectively with the end of Trade-at-Close. This marks the moment when trades can no longer occur for the affected product for the rest of the day.

For products that have no closing auctions at the end of the continuous trading phase, the product state Closing has zero duration, except if there was an auction running at the time when Closing started.

In *Continuous Auction with Specialist* trading model, the Closing phase of a product only occurs when the instrument state Freeze is in effect once the product's Trading phase has terminated. The product state Closing is skipped when no instruments of the product are in instrument state Freeze.

3.2.2.6 Retail Late Trading (optional)

After Closing and, if configured, after Trade-at-Close, products can enter a Retail Late Trading phase, where instruments can be traded with Retail orders and quotes in instrument states Retail Pre-Call and Retail Call, i.e., a Retail Auction.

Non-Retail orders and quotes do not participate in trading in this product state, but they can be maintained as in Post-Trading. Book-or-Cancel orders entered in the book in the main trading phase will be cancelled when entering Retail Late Trading. Any unexecuted Retail order from the Retail Late Trading phase will stay in the book and will participate as a Retail order in future Retail Early and Late Trading or main trading phases, until its validity expires.

The Retail orderbook will be disseminated on all available T7 market data interfaces. Unlike in the main trading hours, the RLP quotes/orders entered during the Retail Late Trading phases will be disseminated to all the trading participants via T7 market data.

[Set Up Information:](#)

[Available only for Deutsche Börse Xetra.](#)

3.2.2.7 Post-Trading

The product state Post-Trading terminates the trading session of a business day. It is typically a time when traders can maintain their orders in preparation of the next trading day. No matching occurs in this phase.

Normally, instruments are in the instrument state Book.

3.2.2.8 End of Day

The product state End of Day represents the time in the evening that is reserved for the end-of-day processing by the exchange. Participants have no access to the order books in this product state.

All instruments are in the instrument state Closed.

3.2.2.9 Post End of Day

The product state Post End of Day technically bridges the time between the end-of-day processing and the next Start of Day. Participants have no access to the system in this product state.

3.2.2.10 Halt

The exchange may halt the market if it judges that market conditions or technical conditions impair the integrity of the market. In such a case, a product is set to the product state Halt. The instrument state during Halt depends on the settings of the exchange.

Set Up Information:

For Eurex and EEX, instruments enter the state Restricted when the product is set to Halt.

*For Xetra, Frankfurt, BSE, MSE, and WBAG with its partner exchanges,
instruments enter the state Closed when the product is set to Halt.*

3.2.2.11 Holiday

The product state Holiday applies to products that are not open for trading on that day, even though the exchange is open. Participants have no access to the order books for a product that is in the product state Holiday.

All instruments are in the instrument state Closed.

3.2.3 Sequence of Trading States

The sequence of product states and the related instrument states depends on the associated set of parameter configurations (*market model*). A market model defines a set of trading rules, e.g. applicable auction types and standard instrument states for specific product states. In addition to this, each instrument is traded according to a particular *trading model*. Examples for trading models are *Continuous Trading with Auctions* or *One Auction*. The typical – yet modifiable – sequence of trading states for these trading models are illustrated in the following, simplified figure, on the next page:

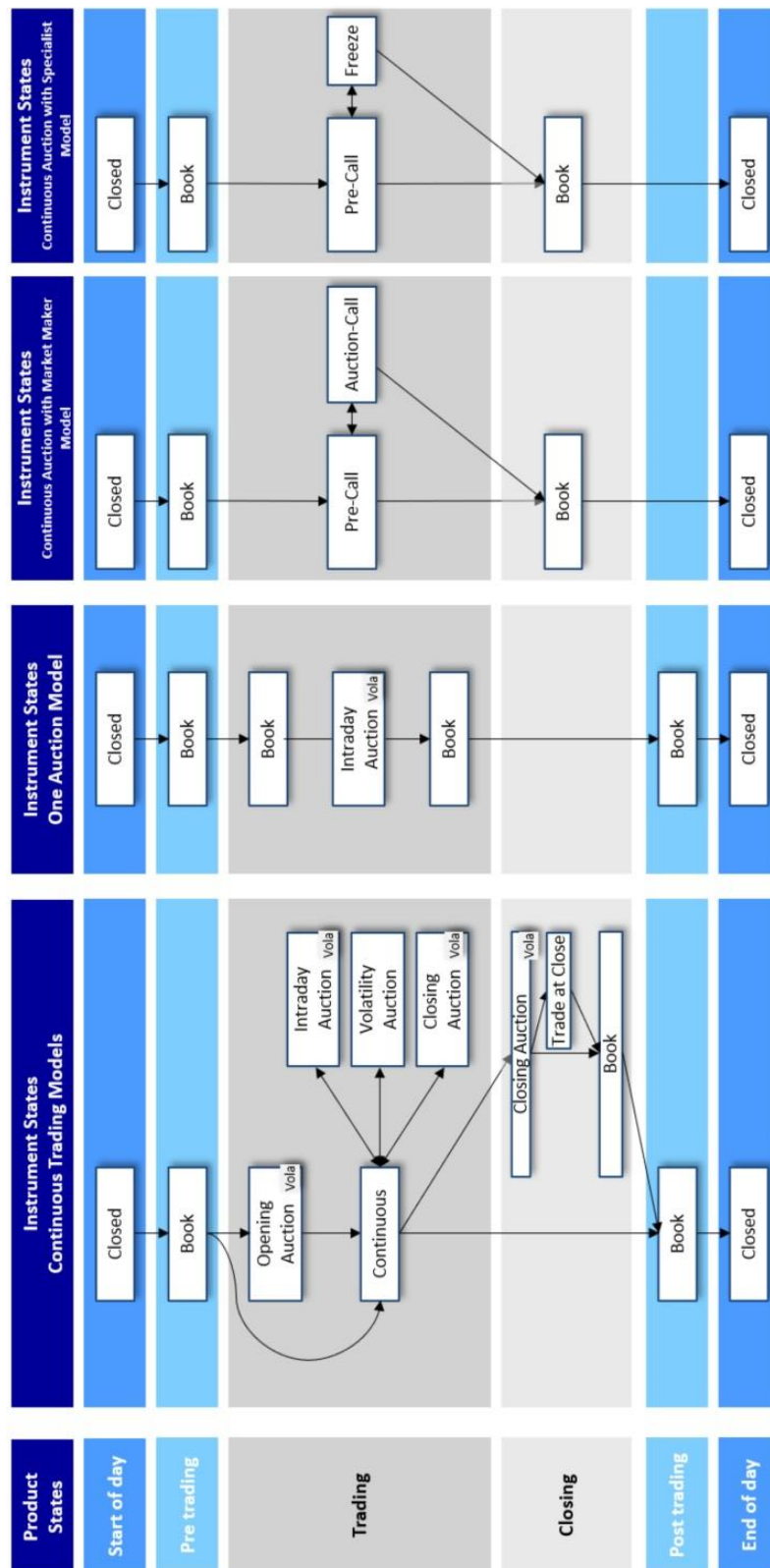


Figure 3-2: The sequence of product states and the related instrument states
(without Retail Early and Late Trading)

The optional product states Retail Early and Late Trading blend into the *Continuous Trading* trading model as follows:

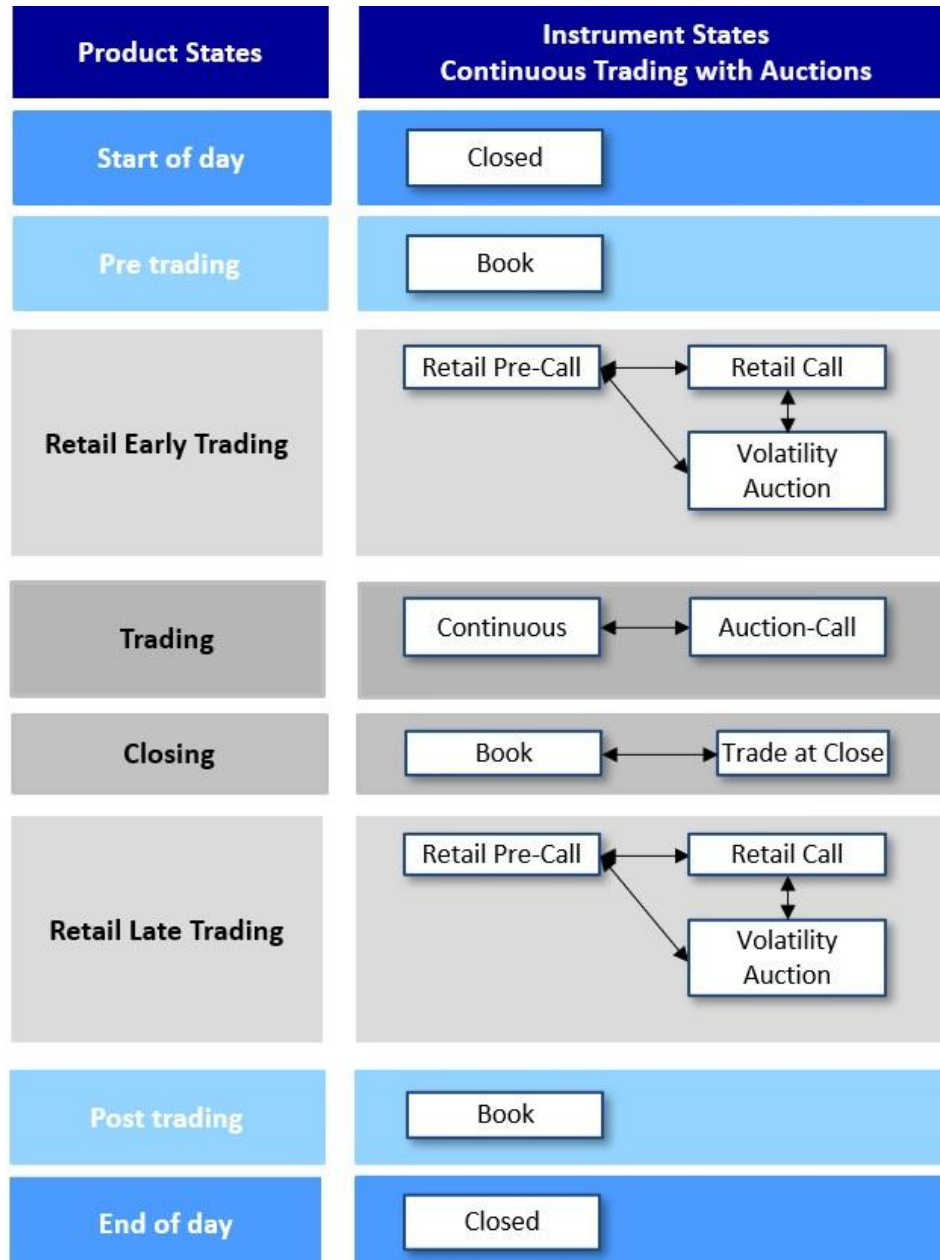


Figure 3-3: The sequence of product states and the related instrument states with focus on Retail Early and Late Trading

Please note that details in other phases have been simplified in this diagram to focus on the Retail Early and Late Trading phases.

3.2.4 Instrument state relations in Continuous Auction with Market Maker

In product state Trading the instrument is changed to Pre-Call as the trading phase. On certain order book situations, an automatic instrument state change from Pre-Call to Auction-Call is performed. On certain triggering events, the instrument state Auction-Call switches automatically back to Pre-Call.

The order book situations triggering the automatic state change from Pre-Call to Auction-Call are:

- When the LP quote would trigger stop orders, i.e., the LP quote bid (resp. ask) is higher (lower) than best stop sell (buy) trigger limit.
- When in absence of an LP quote a crossed order book situation is created by two orders (limit or market).
- When after a match at the price of an LP quote side, there is a remainder of order quantity potentially executable at this price, i.e., a surplus situation.

The triggering events for switching back from Auction-Call to Pre-Call are:

- When the auction ends at random end time.
- When a matching quote was entered by the Liquidity Provider.
- When the order book situation changes, so that there is no longer an executable scenario, and no stop orders can be triggered by the LP quote.
- When the Liquidity Provider deletes the LP quote while there is no crossed order book, and no stop or market orders.

Configuration Data:

The information about the trading phases is available in the Static Reference Data files on the Cash Market website, see chapter 1.2 Usage Notes.

3.2.5 Instrument state relations in Continuous Auction with Specialist

In product state Trading the instrument is changed to Pre-Call as the trading phase. Price determinations are triggered exclusively by the Specialist by changing the instrument state from Pre-Call to Freeze at any time within the trading hours and sending a Matching Quote within the quoting period.

In Freeze, additional participants' order entries, modifications, and deletions are not directly applied but are put as pending on *Locked Stock*. They are processed once the Freeze phase is left again. During Freeze, the Specialist is still able to enter, modify, or delete orders on its own behalf or on behalf of other market participants, except TSO and OCO orders.

The Freeze phase ends

- by the Specialist sending a Matching Quote,
- or by the Specialist unfreezing (cancelling) the Freeze phase,
- or by time-out, due to exhaustion of Maximum Freeze Duration as defined by the exchange.

Only if the Specialist enters a Matching Quote, the Freeze phase ends with a price determination.

For certain instruments only one price determination per trading day is allowed. This is ensured by the Specialist. The attribute *Auction Type* on instrument level has the dedicated valid value "SingleAuction" for these instruments.

[Configuration Data:](#)

The information about the trading phases is available in the Static Reference Data files on the Cash Market website, see chapter 1.2 Usage Notes.

3.2.5.1 Locked Stock

While the Freeze phase in Continuous Auction with Specialist trading model, the *Locked Stock* consists of all order entries, and matching-relevant modifications (see below for details), and order deletions during Freeze phase, so that they are kept in pending state until the instrument leaves the Freeze phase. – In the Locked Stock resolution, T7 processes pending order deletions and order entries and tries to apply pending order modifications.

Locked Stock order transactions

In instrument state Freeze, the following transactions do not participate in the price determination but are stored as pending in the Locked Stock:

Order entries:

- Orders are marked as *Pending Add*.

Order modifications:

- Order modifications which are matching-relevant are marked as *Pending Modify*. The matching-relevant changes that lead to a *Pending Modify* are:
 - Change of price (affects order priority).
 - Change of quantity, increasing (affects order priority), *and* decreasing.
 - Change of order restriction.
 - Change of stop price.
 - Change of limit of an OCO order.
- Order modifications affecting orders in the Locked Stock, i.e., previously added or modified, regardless of previous list.

Order deletions:

- Order deletions affecting orders in order book are marked as *Pending Delete*.

Immediately applied transactions

In Freeze, the following transactions do not enter the Locked Stock but are applied immediately:

- Order modifications affecting orders in order book if not affecting their matching priority and if no previous modifications are in Locked Stock, e.g. text field changes.
- Order deletions of Locked Stock orders in state *Pending Add* are executed immediately, deleting them from Locked Stock.
- Order entries, modifications and deletions performed by the Specialist on behalf of another Business Unit.

Locked Stock Resolution

Before the Locked Stock transactions are processed, the Freeze ends with a possible price determination based on a matching quote of the Specialist. Then, the pending transactions in Locked Stock are processed:

- Pending transactions related to an order book order of which no quantity remains after matching are discarded, and an execution message is sent with *Pending Cancellation* and executed Qty > 0.
- Pending transactions related to an order book order of which quantity remains after matching are executed if possible, and an execution message is sent with *Pending Cancellation* and remaining Qty > 0.
- Pending transactions not related to an order book order are processed normally.

It is important to note that orders marked as *Pending Deletion* still participate in the trade made at the end of the auction freeze state. Sending a deletion request for an order during Freeze does not prevent the order from being matched. It only guarantees that any remainder of the order is deleted right afterwards.

Locked Stock scenarios

In the appendix all relevant scenarios are listed, which can occur in connection with order add, modify, and delete messages on Locked Stock, as well as basic information about order notifications created per action before, during and after Freeze.

3.2.6 Special non-normal Market Conditions

This chapter refers to special market conditions, which are considered as non-normal by the MiFID II regulation.

T7 supports the following special market conditions:

- Stressed Market Conditions (SMC)
T7 automatically detects stressed market conditions according to regulatory guidelines, which refer to a significant short-term change of price and volume (cf. chapter 7.9). Automatically set stressed market conditions hold for a predefined duration at minimum. Automatically set stressed market conditions are prolonged, when the triggering conditions are detected again during their duration.
Stressed market conditions apply per instrument in cash markets, respectively per product in derivatives markets.
- A state of Fast Market implicates stressed market conditions. Fast market is declared by the exchange for a product when an especially volatile market situation is expected. In cash markets, Fast Market is declared for the entire market.
- Exceptional circumstances
According to regulatory guidelines, the exchange declares exceptional circumstances for an entire market e.g. under the following circumstances:
 - State of extreme volatility
In derivatives markets, extreme volatility is established when the majority of products, which are subject to a market making scheme, are in stressed market conditions or in a volatility interruption. In cash markets, extreme volatility is established when the majority of instruments are in a volatility interruption or extended volatility interruption.
 - War, industrial action, civil unrest or cyber sabotage
 - Disorderly trading conditions at the exchange

Additionally, a suspension of pre-trade transparency obligations for a product is considered as exceptional circumstances.

During fast market and stressed market conditions, the following price and quantity validations may be relaxed, depending on the product specific settings as decided by the exchange:

- The Minimum Quote Size may be lower (chapter 5.5.2).
- The Price Range may be enlarged (chapter 6.1.2), which implies that:
 - The Price Reasonability Check may be relaxed (chapter 6.2),
 - The Maximum Quote Spread for double-sided quotes may be enlarged (chapter 6.4),
 - The Market Order Matching Range (chapter 7.3) may be enlarged, and
 - The conditions for the acceptance of requests for an RfQ (chapter 5.7) are stricter.
- The Extended Price Range may be enlarged which implies that the Extended Price Range Validation is relaxed (chapter 6.3).
- Additionally, for fast market conditions, the conditions for a Volatility Interruption to occur are relaxed (chapter 7.6).

In T7, fast market and stressed market conditions are supplementary to the product, respective instrument state, which can be set independent of these states. This allows, for example, to have a product to be set to Fast Market already early in the morning before trading starts, without any impact on the sequence and timing of the product states. Stressed market conditions and fast market are published in T7 market data interfaces.

Exceptional circumstances are published via news messages only, and can be set independently from other special market conditions.

3.3 TES Activity Status

The TES activity status for a product determines which off-book activities are allowed in the product.

Product States	TES Activity Status
Start of Day	OFF
Pre Trading	
Trading	ON
Closing	
Post Trading	
End of Day	Ended
	OFF

Figure 3-3: On-book Product States and TES Activity Status

The following values for the TES activity status exist:

- **On** – When the TES activity status is On for a product, then TES trade entry, TES trade modification, TES trade deletion and TES trade approval are allowed for all the instruments of the corresponding product.
- **Ended** – The TES activity status Ended terminates the TES trading session of a business day. All still pending TES trades are automatically deleted during the transition to the TES activity status Ended. Further TES trade entry is not possible anymore. It is still possible to enter pre-approved bilateral OTC uploaded trades during “Ended”. Market Supervision can still approve TES trade reversals.
- **Off** – The TES activity status Off indicates that the product is no longer available for TES trading or TES trading has not been started for the day. In this case, all TES activities are disabled for the product.
- **Halted** – The TES activity status Halt is reserved for emergency situations. The exchange may set the TES activity status to Halted for a product if they judge that market conditions or technical conditions impair the integrity of the market. In this state TES trade entry/modification/approval and deletion are not allowed. Pending TES trades remain when the TES activity status is Halted.

3.4 Instrument Status (On-Book and Off-Book)

In T7, the instrument *status* is different from the instrument *state*. The instrument status controls in principle if the instrument is available for trading or not. Thereby, it is distinguished between the instrument status for on-book and off-book, i.e., *TES* trading. Both can be determined separately, i.e., an instrument can e.g. be deactivated for on-book trading but not for *TES* trading at the same time.

The following instrument status are available in T7:

Instrument Status	Description
Active	The instrument status of an instrument to allow trading.
Inactive	The exchange may decide to deactivate an instrument during the day. Trading is deactivated at all.
Expired (for derivatives only)	Instruments that expire during the trading day, rather than at the end of the trading day (<i>Intra-day Expiry</i>) acquire upon expiration the listing status 'Expired' as opposed to 'Active'. Trading is not possible anymore; the instrument state is changed to 'Restricted'.
Delisted (for cash only)	Instruments with last trading date in the past; pending deletion. Trading is not possible anymore; the instrument state is changed to 'Restricted' resp. to 'Closed'.
Suspended	The exchange may suspend an instrument under unusual circumstances or on "Knock-out-Locked". A suspended instrument acquires the listing status 'Suspended' as opposed to Active. Trading is not possible anymore; the instrument state is changed to 'Restricted'.

3.5 Listing Status

The Listing Status of an instrument is a general status that controls whether an instrument is currently available for trading. The listing status exists in addition to the instrument state for on-book trading that had been described before. The listing status is maintained separately for on-book and off-book trading. The listing status of an instrument that can be traded is Active. An instrument that is not tradable has a listing status of Expired, Suspended or Stopped, as explained in the following.

3.5.1 Intra-day Expiry

Derivative instruments that expire during the trading day, rather than at the end of the trading day, acquire the listing status Expired as opposed to Active.

The on-book instrument state of an instrument with a listing status Expired is either Restricted or Closed, depending on the product state.

3.5.2 Instrument Suspension

The exchange may suspend an instrument intraday. A suspended instrument acquires the listing status Suspended as opposed to Active.

The on-book instrument state of an instrument with a listing status Suspended is either Restricted or Closed, depending on the product state.

Set Up Information:

For Xetra, Frankfurt, BSE, MSE, and WBAG with its partner exchanges, all orders and quotes are automatically deleted by T7, when the listing status Suspend is acquired. In case the order book is not empty, a broadcast message of type "Instrument Suspension" is sent to all sessions indicating that orders and quotes have been deleted.

3.5.3 Instrument Stop

Stop is used by the exchange in order to temporarily stop an instrument from trading independently of the product state.

The on-book instrument state of an instrument with a listing status Stopped is either Restricted or Closed, depending on the product state.

3.5.4 Intraday Inactivation

The exchange may decide to inactivate a complex instrument during the day. An inactive complex instrument cannot be traded anymore.

The on-book instrument state of a complex instrument with a listing status Inactive is Closed.

3.5.5 "Knock-Out" and "Sold-Out"

When a certain value of the underlying of a "Knock-out" certificate is crossed, the certificate is "knocked-out" by the Liquidity Provider. This is possible in the instrument states Book or Pre-Call. A "Knock-Out" event deletes all orders and the LP quote, and the market participants are informed. Afterwards, the only trading in the certificate is buying it back by the Liquidity Provider for a residual value for tax valuation reasons, i.e., only LP quotes with price and quantity on the buy side are allowed (redemption trading). In case of a "Knock-out-locked", the instrument stays in the state Closed/Suspend, and no redemption trading takes place. Both kinds of "Knock-out" can be revoked.

When a Liquidity Provider has sold out all available quantity, then the instrument is "Sold-Out". On notification of a "Sold-Out" event, T7 deletes the LP quote and the market participants are informed. Afterwards, the Liquidity Provider can enter LP quotes with a certain quantity on the buy side whereas the quantity on the sell side has to be zero. The "Sold-Out" situation can be revoked by the Liquidity Provider, then being able to quote on the buy side again.

Once "Sold-Out" is declared, no auction call phase is triggered if there are only market or limit buy orders in the book. Only stop orders triggered by a quote still result in an auction call phase. Auction call phases are triggered, when after a match at the price of the LP's quote bid side, there is a remainder of order quantity on the ask side potentially executable at this price, i.e., a surplus situation.

3.6 End-of-Day Processing

The on-book End-of-day product state and the TES activity status Off ends with the end-of-day processing. During the end-of-day processing, T7 regularly performs the following clean-up activities:

- Deletion of expired orders. All GFD orders and all GTD orders with a contract date before the next trading day are deleted by T7.
- Deletion of orders of expired instruments. All orders of expired instruments or of complex instruments with an expired leg instrument are deleted by T7.
- Deletion of expired instruments. T7 deletes expired instruments and all complex instruments that have an expired leg instrument.
- Clean-up of temporary complex instruments. T7 deletes those complex instruments that have no more orders in the order book. An exception to this are complex instruments that have been created by the exchange.
- Deletion of pending TES trades.
- Clean-up of flexible instruments. T7 deletes all the flexible instruments created during the day.

Furthermore, orders are deleted under special circumstances, as e.g. in the case of corporate actions for an Equity or an Exchange Traded Fund.

4. Orders

This chapter starts with the characteristics and the maintenance of orders in general, especially Regular Orders. Special types of orders such as Stop orders (including TSO and OCO orders), Iceberg orders, Book-Or-Cancel orders, Auction-Only orders, or Intraday-Auction-Only orders and the like, are dealt with further down in this chapter. Quotes are described in chapter 5.

4.1 Order Attributes

An order is defined by – among others – certain order attributes:

- Price condition and limit price.
- Quantity.
- Validity.
- Order Identifications.
- Time Stamps.
- Technical Order Attributes.
- Other Attributes.

4.1.1 Price condition and limit price

An order can be either a Limit order or a Market order. This order attribute is called *price condition* (please do not confuse the distinction of Limit and Market orders with the *order type*).

Limit orders have a limit price. The limit price indicates the maximum price at which a buy order is allowed to match, or the minimum price at which a sell order is allowed to match.

Market orders are orders that have no limit price. They are only allowed for simple instruments. Since market orders are not protected by their limit price, there are other mechanisms provided by T7 that give market orders some protection against unreasonable trade prices. First of all, market orders can be protected by price limits that depend on current market conditions. They are described in chapter 7.3. Furthermore, the market data feeds of T7 can be parametrized to publish no information about the presence of market orders. In this case, market orders are not visible.

Set Up Information:

The mechanisms to protect market orders are not applicable for Xetra, Frankfurt, BSE, MSE, and WBAG with its partner exchanges. Furthermore, market orders are always visible on Xetra, BSE, MSE, and WBAG with its partner exchanges, i.e., they are always published via the T7 market data feeds; not so for Frankfurt.

In general, T7 supports prices that are positive, zero or negative. However, for most products only strictly positive limit prices and trade prices are accepted by T7.

Set Up Information:

For Eurex, zero and negative prices are allowed for some special products only, e.g. Total Return Futures and MOC Futures.

For all other exchanges, only strictly positive prices are allowed, without exception.

4.1.1.1 Prices: Tick size and price step table

The *Tick Size* defines the minimum increment for trade prices in a product. Any trade price, and thus any limit price, is an integer multiple of the tick size.

In addition to that, a valid limit price must be a valid price as defined by the *Price Step Table* that is relevant for the instrument. A price step table defines price intervals and the size of the price step for each price interval. The lower end of such a price interval is always a valid limit price. Inside each price interval, valid limit prices are those that can be obtained by adding a positive integer multiple of the price step to the lower end of the price interval. Negative limit prices are valid limit prices, if their absolute value (i.e., the same number without the minus sign) is in agreement with the price step table. Price steps are always integer multiples of the tick size, and therefore, valid limit prices are always integer multiples of the tick size. Nevertheless, not every multiple of the tick size is a valid limit price.

Example 4-1:

The tick size is 0.01. The price step table defines the first price interval to range from 0.00 to 10.00 with a price step of 0.01, and a second price interval from 10.00 to infinity with a price step of 0.10.

Then 9.98, 9.99 and 10.00 are valid limit prices, and so are 10.10, 10.20, 10.30 etc., but 10.01 is not a valid limit price. An order with a limit price of 10.01 would be rejected by T7.

If the product supports negative prices, then also -9.98, -9.99 and -10.00 are valid limit prices, and so are -10.10, -10.20, -10.30 etc., but -10.01 is not a valid limit price. Furthermore, if the product supports negative prices, then 0.00 is allowed, else 0.01 is the smallest possible price.

In general, trade prices are prices that are also valid limit prices. However, in the context of matching of complex instruments, it is possible that trade prices occur that are not valid limit prices according to the price step table.

Configuration Data:

The price step tables are published by T7's Reference Data Interface in the product snapshot message (RDI message group name: TickRules).

4.1.2 Quantity

The Total Quantity of an order is provided by the user that enters the order.

T7 provides the Open Quantity of an order, which is the part of the total quantity that is still available for matching, and the Accumulated Executed Quantity, which is the part of the total quantity that has already been matched. During the lifetime of an order, the total quantity of the order is always equal to the sum of the open order quantity and the accumulated executed quantity. When an order is deleted, the total quantity of the order is equal to the sum of the deleted order quantity and the accumulated executed quantity.

Setup Info EEX:

The quantity must correspond to a multiple of a round lot for certain products (especially natural gas).

4.1.3 Validity

The Order Validity limits the lifetime of the order. T7 supports the following values for the Order Validity:

- Price condition and limit price.
- Good-For-Day (GFD) orders are deleted automatically in the next end-of-day processing.
- Good-Till-Cancelled (GTC) orders are automatically deleted only if the instrument has expired.
- Good-Till-Date (GTD) orders carry an expiry business date and are automatically deleted in the end-of-day processing, if the next business date is later than the specified expiry business date.
- Immediate-Or-Cancel (IOC) orders are deleted automatically after having been processed on entry, without ever going to the order book.
- Fill-Or-Kill (FOK) orders must be fully executable on entry to be accepted by T7, otherwise they get deleted. For FOK orders see also chapter 4.17.

4.1.4 Order Identifications

When a new order is accepted by T7, the system assigns it an exchange order ID. The exchange order ID is guaranteed to be unique among all orders and quotes of the same product within a market that have an open quantity on the same business day.

The entering user may optionally assign a *client order ID* to the order. The client order ID is verified by T7 to be unique across the instrument and session scope in the order book at the time of order entry. The client order ID is, however, not verified to be unique for IOC and FOK orders.

When modifying or deleting an order, the user identifies the order either with the exchange order ID or with the client order ID if available. The user may or may not assign a new client order ID to the order with each order modification or deletion. The exchange order ID remains in any case unchanged for the entire lifetime of the order, i.e., an order modification does not result in a change of the exchange order ID, even if the time priority of the order is changed.

T7 maintains an order version number which is initialized to 0 for new orders and incremented for each order maintenance activity which updates the order priority.

4.1.5 Time Stamps

T7 sets the Entry Time Stamp of an order when the order is entered. It is for informational purposes only. Any modification of an order has no impact on the entry time stamp of the order.

Furthermore, T7 sets and maintains the Priority Time Stamp. The priority time plays a role in the order allocation during matching. The priority time stamp of an order is updated in a number of well-defined situations:

- Certain order modifications; see section 4.2.2 on order modification for details.
- Triggering of a stop order, trailing stop order or an OCO order.
- Activation of an opening-auction-only order, a closing-auction-only order, an auction-only order, or an intraday-auction-only order.

[Set Up Information:](#)

For Xetra, Frankfurt, BSE, MSE, and WBAG with its partner exchanges the priority

time stamp of an order is also updated if the validity is extended. Shortening the validity period of an order has no impact of the priority time stamp.

4.1.6 Technical Order Attributes

4.1.6.1 Persistent and non-persistent Orders

Any order can be entered either as persistent order or as non-persistent order. The following functional restrictions apply for non-persistent and persistent orders:

- Non-persistent orders are not allowed in combination with order attributes Good-till-Date (GTD) and Good-till-Cancelled (GTC). Standard persistent orders can be entered with order attributes Good-till-Date (GTD) and Good-till-Cancelled (GTC).
- Persistent orders are not allowed as lean orders, see below.

Persistent orders are persisted in a database of T7. This prevents persistent orders from being lost in case of a technical system failure. During the restart after a system failure, T7 re-loads the persistent orders from the database. The priority time stamp of these orders remains unchanged.

A non-persistent order is processed without the extra step of being persisted in a database. As opposed to persistent orders, non-persistent orders are not re-loaded to the order book after a system failure, i.e., they are definitively lost.

In addition to a system failure, non-persistent orders are automatically deleted in the following situations:

- The product state is changed to Halt.
- A volatility interruption has occurred (depending on the exchange configuration, see section 7.6).
- The owning session is disconnected.
- A technical back-end partition overload has been detected.

[Set Up Information:](#)

For Deutsche Börse Frankfurt, only persistent orders are allowed.

4.1.6.2 Lean Orders

Any non-persistent order can be flagged as a 'Lean' order.

For lean orders, the receipt of status information messages is restricted to the session, through which the order had been entered. Furthermore, only such information messages may be recovered via a retransmission request that is about executions and about events which were not solicited by the owner of the order.

For an order that is not flagged as a lean order, the receipt of status information messages is not restricted to the session through which the order had been entered, and information messages about all events regarding the order may be recovered via a retransmission request.

T7 does not accept orders that are both lean and persistent. Orders that are entered through a high-frequency session may be persistent or non-persistent.

T7 does not accept orders that are both lean and Good-Till-Date (GTD), or both lean and Good-Till-Cancelled (GTC).

See the *T7 Enhanced Trading Interface (ETI) Manuals* for more information about the different types of sessions in T7, on receiving information messages about order events, including retransmission of such messages, and in general on the technical aspects of order maintenance.

[Set Up Information:](#)

For Deutsche Börse Frankfurt, lean orders are not available.

4.1.7 Other Attributes

The user may provide a Cross ID for an order, which prevents the matching against identically tagged orders, or quotes of the same business unit by means of the self-match prevention functionality of type A (see chapter 7.7).

Several order attributes, which are sent by the user, are not directly relevant to the order matching but serve other purposes, e.g. in the post-trade processing or to satisfy the requirements of the regulator.

These are:

- The Trading Capacity, distinguishing *Proprietary*, *Agency* and *Market Maker*, and additionally *Retail Liquidity Provision* and *Retail Agency*, *Riskless Principal Execution*, and *Issuer/Liquidity Provider* for cash markets. It is validated whether the usage of the trading capacity *Agency* is compliant with the *client service authorization* of the corresponding trading participant, obtained from the participant's national authority.
- Clearing related attributes like Clearing Account, Take-Up Member and Open-Close Indicator.
- Free Format Text fields.
- A Regulatory Information attribute for use by the trading surveillance office.
- A Country Code indicating the real origin of the order (derivatives only).
- A Rate Identifier according to FIA guidelines (derivatives only), also known as *Customer Order Handling Instruction*. Strict validation for valid values in case of Trading Capacity *Agency*, otherwise allowed to be left empty.
- MiFID II related attributes like Client ID, Execution ID (short code for a human person or Algo ID) and Execution Qualifier covering the ESMA field "execution within firm"; Investment ID (short code for a human person or Algo ID) and Investment Qualifier covering the ESMA field "investment decision within firm", Liquidity Provision Activity, and for commodity markets the attribute Risk Reduction.
- An optional DMA flag (*OrderOrigination*) can be set, indicating Direct Market Access. It is only available for Trading Capacities "A" and "R". Participants need to register for DMA trading.
- An optional flag to participate in trading in Trade-at-Close instrument phase. It can be set for regular Market and Limit orders as well as BOC orders of any validity. The Trade-at-Close flag cannot be modified after order entry. Setting the Trade-at-Close flag does not prevent an order from participating in trading outside Trade-at-Close. Maintenance is possible for orders with and without Trade-at-Close flag set. For more information see the section about Trade-at-Close 3.2.1.3.

- An optional End Client Disclosure field for the voluntary Buy-Side Trading Disclosure. Either the 5-characters Buy-Side Client ID or the client's 20-character Legal Entity Identifier LEI. The exchange decides for which products it can be used.

[Set Up Information:](#)

Only Eurex is using it.

- An optional Best Bid Offer (BBO) Setting flag is assigned to orders or quote sides, which indicates whether the order or quote side set a new best bid or best ask price in instrument trading phase Continuous on order entry, or on order modification with a change of price-time priority. This flag is set regardless of whether direct (partial) execution takes place, or the order or quote is inserted into the order book.

[Set Up Information:](#)

Only Deutsche Börse Xetra is using it.

See chapter 12.2 for more information about the handling of clearing related attributes or of free format text fields.

4.2 Order Maintenance

4.2.1 Order entry

On order entry, T7 validates that the order attributes, which are relevant for trading, contain valid values. Orders with invalid attribute values are rejected.

The entered total order quantity must not violate the Transaction Size Limits that have been configured for the product and for the entering business unit or user. This applies for derivatives markets only, whereas for cash markets the entered order is validated against a maximum order quantity which is configurable per user. Additionally, the order value is compared against a maximum order value (see chapter 14), which is configurable per user. The order is rejected if the maximum order value is exceeded. Please note that besides the maximum limits for quantity and value defined by the user, there are such limits defined by the exchange.

Depending on various conditions, the limit price of a limit order may be validated with the Price Reasonability Check (see chapter 6.2) or with the Extended Price Range Validation (see chapter 6.3).

Entry of orders is possible during the instrument states Book and Continuous, and during auction instrument states. During the instrument states Closed and Restricted, and during auction freeze instrument states, order entry is not possible. Orders entered in Freeze in *Continuous Auction with Specialist* trading model go into the Locked Stock.

If the instrument state is Book or an auction state, an incoming order is written to the book without matching. IOC and FOK orders are deleted instead of being written to the book.

[Set Up Information:](#)

For Xetra, BSE, MSE, and WBAG with its partner exchanges, orders with attribute BOC are only allowed in the instrument state Continuous. I.e., they cannot be entered during the instrument states Book or Auction.

In the instrument state Continuous, an incoming order is first matched against orders and quotes on the opposite side of the order book, if possible. See chapter 7.1 for the matching rules in continuous trading. The open quantity and the accumulated executed quantity of the order are determined. Any

remainder is written to the order book, except for an IOC order, which is deleted instead.

Based on an order's type, restrictions and order validity, T7 may reject orders that have no chance to ever get executed, as e.g. GFD orders being entered in the product state Post-Trading. The behavior depends on the exchange.

4.2.2 Order modification

A user can modify an order that rests on the order book. The modification request must identify the order with the help of its client order ID – if available – or of its exchange order ID.

See chapter 4.2.5 on order ownership and who is allowed to modify a specific order.

The user may modify the limit price and may modify the total order quantity. A new limit price and a new total order quantity are subject to the same validations as for order entry.

The accumulated executed quantity is carried forward to the modified order while the open order quantity gets recalculated if the total order quantity is modified. An attempt to modify the total quantity of an order to a value below the already executed quantity results in the deletion of the order.

The priority time stamp of an order is updated, when:

- the limit price of the order is changed, or
- a market order is modified to become a limit order or vice versa, or
- the total order quantity is increased.
- the stop price of a stop order, a TSO order, or an OCO order is modified.
- the calculation mode of a TSO order's trailing amount is modified (absolute or percentage).

Depending on the exchange's configuration, the priority time stamp of an order is updated, when the order validity is extended. Shortening the validity period of an order has no impact on the priority time stamp.

The modification of any other order attribute has no impact on the time priority of an order.

Set Up Information:

For Eurex and EEX the priority time stamp of an order is not updated if the validity is extended.

For Xetra, Frankfurt, BSE, MSE, and WBAG with its partner exchanges the priority time stamp of an order is updated if the validity is extended.

If the instrument state is Continuous, and if any of the above listed conditions for the update of the priority time stamp is fulfilled, then T7 makes a fresh attempt to match the modified order as if for a new incoming order.

Note that a fresh attempt to match a book order, the quantity of which has been changed, is irrelevant for limit orders, but it could result in a match in the case of a book market order. See chapter 7.3 for details.

The following attributes of an order cannot be modified:

- Instrument identifier.
- Side (Buy or Sell).
- Technical order attributes Persistent and Lean (see chapter 4.1.5).
- Furthermore, orders cannot be modified to change their category as defined in chapter 4.16.1.

If the user wishes to modify any of these attributes of the order, the user would have to delete the existing order and place a new one.

4.2.3 Order deletion

A user can delete an order that rests on the order book. The deletion request must identify the order with the help of its Client Order ID (if available), or its Exchange Order ID. Furthermore, T7 supports the deletion of all of a user's orders in a product or in an instrument with one request. See chapter 4.2.5 on order ownership and who is allowed to delete a specific order.

During an auction freeze state, a deletion request for an order results in this order being marked as pending deletion, rather than being deleted right away. See chapter 3.2.1 for details.

4.2.4 Automatic and Mass order deletions

An automatic order deletion occurs e.g. on the following occasions:

- Orders with expiring validity are deleted at the end of the business day (cf. chapter 3.6).
- An order modification changing the total quantity to a value below the already executed quantity results in the deletion of the order (cf. chapter 4.2.2).

The following table provides an overview over automatic and mass order deletions scenarios:

N = Delete non-persistent orders.

P = Delete persistent orders.

Event	Derivatives	Cash Markets	Pending Delete possible (Y/N)
Volatility Interruption	N	-	N
Instrument Suspension	N	N, P	N
Instrument Stop	N	N	N
Product temporarily not tradable (Slow Partition)	N	N	N
Product State Halt	N	N	N
Mass Delete by Market Operation	N, P	N, P	Y
Clearing Member Stop	-	N, P	Y
Session Disconnect (Loss, Logout or Duplicate Login)	N	N	Y
Mass Cancellation by Trader	N, P	N, P	Y
Emergency Mass Delete by Trader	N, P	N, P	Y
Trader/ Business Unit Stop	N, P	N, P*	Y

* In case of a trader stop, the non-persistent orders and quotes of a Retail Liquidity Provider (RLP) in cash markets are not deleted.

Please note that the order deletion scenarios include quotes which are always non-persistent. This is not the case for trader stops, since quotes belong to sessions, not to individual traders.

4.2.5 Ownership concept

Every order is attributed to an owning user, an owning session and an owning business unit. On order entry, the user who entered the order becomes the owning user of the order, and the respective business unit becomes the owning business unit, and the session through which the order was entered, becomes the owning session of the order.

In general, only the owning user of an order can modify or delete the order. Exceptions are the following two cases:

- A user that is not the owning user can modify or delete the order, if configured as a Supervisor user and belonging to the owning business unit.
- A user that is not the owning user can modify or delete the order, if the user is configured as a Head Trader and belongs to the same trader group as the owning user.

A Supervisor or a Head Trader that modifies an order, which belongs to a different user, may choose either to take over the ownership of the order, or to let the order keep its original owning user.

In general, the modification or the deletion of an individual order is possible through any session that belongs to the owning business unit. However, the modification of an individual order through a session that is not the owning session is not permitted in the following cases:

- If the order is a lean order (see chapter 4.1.6).
- If the session, through which the modification request is entered, is a high-frequency session. (See the *T7 Enhanced Trading Interface (ETI) Manuals* for information about the different types of sessions in T7.)

These restrictions do not apply to order deletion.

4.2.6 Safeguards

Find detailed information about safeguards of all kinds in chapter 14.

4.2.7 Eurex Market Order Validations for Options

For Eurex, the following validations apply for all Market order entries and all Market order maintenance for Options products, depending on the switch *checkMarketOrder* published in reference data per product:

- In the instrument state *Book* all Market orders are rejected.
- In the instrument state *Continuous* Market orders are rejected if there is no valid bid/ask price available on the opposite side of the incoming Market order. The validation is applied also to the modification of a Market order.
- In the instrument state *Auction* Market orders are generally allowed.
- With the transition to *Continuous*, sitting Market orders are validated and – if necessary – cancelled. This is also valid for Auction Uncrossing.
- Stop Market orders are generally rejected.

During recovery (Initial or Intra-day) no validations of Market orders are performed since the Market orders, if any in the book, would have previously passed the validation.

When incoming Market orders are rejected due to the Market order validation, traders receive a dedicated rejection reason. When sitting Market orders are cancelled the cancellation is also marked with a special deletion reason code.

4.3 Stop Orders

4.3.1 Overview

A stop order is an order that is initially inactive. It is not able to match, and it is not included in the public market data. When the market reaches the price level that is given by the stop limit of the stop order, then the stop order is triggered, i.e., it is converted to an active regular order and, if possible, matched according to the rules for incoming regular orders.

A buy stop order is normally placed at a stop limit above the current market limit, and a sell stop order is normally placed at a stop limit below the current market limit.

A stop order can be a Stop Limit Order or a Stop Market Order. A triggered stop limit order is converted to a limit order, and a triggered stop market order is converted to a market order.

[Set Up Information:](#)

Eurex and Nodal support stop market and limit orders for futures, but no stop orders for options. EEX supports only stop market orders for futures, but no stop orders for options.

4.3.2 Stop Order Maintenance

A stop order must have a stop limit. The stop limit is used to determine under which condition the stop order is triggered. See chapter 4.3.3 for the rules on stop order triggering.

A stop limit order additionally must have a limit price. This limit price is the limit price of the limit order that the stop limit order is converted to when being triggered.

A stop market order has no limit price. Upon being triggered, it is converted to a market order. Validations that are specific to market orders, as e.g. the validation against a market order specific order size limit, are in the same way applied to stop market orders on entry.

Both the limit price and the stop limit must be valid prices in respect to the rules for limit prices as outlined in chapter 4.1.1.

The stop limit and the limit price can be modified, but the stop order loses its time priority in this case. The same occurs if a stop market order is modified to become a stop limit order or vice versa.

A stop order can be entered with an order validity of GFD, GTC or GTD. The entered order validity continues to apply after the order has been triggered.

For stop limit orders, the Price Reasonability Check is obligatory; see more in chapter 6.2.

The stop limit of the stop order is validated against the current market limits. Only buy stop orders, of which the stop limit is greater than the Best Available Buy Limit, and sell stop orders, of which the stop limit is smaller than the Best Available Sell Limit, are accepted and saved as stop orders on the order book. The best available limit is normally given by the limit price of the best limit order on the order book side. For the case of synthetic matching, its definition is given in the chapters on synthetic pricing

in the *T7 Functional Reference Part 2*.

The handling of stop orders that fail this validation is defined for each product by the exchange. Depending on the configuration of the product, either they are rejected, or they are immediately converted to regular orders.

The same validation is applied for a modification request, if the stop limit or, in case of a stop limit order, the limit price is modified or if the quantity of the stop order is increased. A rejection of the modification request means here that the stop order remains on the order book unchanged.

Set Up Information:

All exchanges on the T7 system reject stop orders, which fail the entry validation of the stop limit against current market limits. This applies to all products where stop orders are supported. Please note that for Continuous Auction trading models there is no such validation against the current market limits.

4.3.3 Stop Order Triggering

When stop orders are triggered, there is no Price Reasonability Check and no Extended Price Range Validation for triggered stop limit orders. The priority time stamp is updated. The Exchange Order ID is not modified.

Stop orders are converted to incoming regular orders and treated as such thereafter. There is no guarantee that a triggered stop order is matched immediately after it is triggered. It is treated just as any incoming regular order and is placed in the order book, if it cannot be matched. – In case of triggering in a quote-driven order book uncrossing, the stop order is always matched, see below.

Stop orders are triggered one by one in separate transactions. They are always triggered at the end of the transaction, which creates the triggering condition.

Example 4-2:

An incoming sell order matches against the order book at the price levels 80, 75 and then 70. The first match at 80 creates the condition for triggering a stop order on the book. T7 first completes the matching of the incoming order at 75 and 70 and process the triggering of the stop order afterwards.

If the incoming order causes a volatility interruption while attempting to match at 70, the instrument state change to the volatility auction is done first and the processing of the stop order that got triggered by the match at 80, is done last.

T7 supports three types of trigger conditions: Triggering based on the last trade price, triggering based on the best buy or best sell limit and triggering in quote-driven order book uncrossing. The methods are described in the following.

1. Stop order triggering based on the last trade price:

During the product state Trading, a new trade price can trigger stop orders. The cause of the trade is of no relevance, i.e., the trade could be caused by a matching incoming order, by an auction trade or by another stop order that is triggered and matched itself. The only exception

is that stop orders are not triggered by leg trade prices resulting from the decomposition of pure complex instrument trades.

A buy stop order is triggered if the new trade price is higher than or equal to the stop limit of the stop order. A sell stop order is triggered if the new trade price is lower than or equal to the stop limit of the stop order.

Set Up Information:

For Eurex and EEX, stop orders are not triggered by a closing auction trade price.

2. Stop order triggering based on the best buy / sell limit:

During the instrument state Continuous, a best buy limit or best sell limit can trigger stop orders. This applies also to best buy limits and to best sell limits resulting immediately after an auction, if the instrument state Continuous follows the auction.

A buy stop order is triggered, if the new best buy limit is higher than or equal to the stop limit of the stop order. A sell stop order is triggered, if the new best sell limit is lower than or equal to the stop limit of the stop order.

Synthetic limits (see the chapters on synthetic matching and pricing in the *T7 Functional Reference Part 2*) are not taken into account for the triggering of stop orders.

Set Up Information:

All exchanges on T7, except Deutsche Börse Frankfurt, apply exclusively triggering based on the last trade price.

3. Stop order triggering in quote-driven order book uncrossing:

In the Auction-Call and Freeze phases of Continuous Auction trading models with quote-driven order book uncrossing, stop orders are considered immediately as if triggered. They are triggered based on the opposing side of the matching quote.

Set Up Information:

Currently set up for Continuous Auction trading models in Deutsche Börse Frankfurt.

Stop order triggering based on the last trade price is applied for all products for which stop orders are supported. The exchange defines by product, whether stop order triggering based on the best buy /sell limit is additionally applied.

4.3.4 Triggering Priority

At the end of a transaction, several buy and/or sell stop orders can be triggered and each triggered stop order can potentially match again and trigger new stop orders. Hence, a triggering priority must be established. No special priority is given to the stop market orders compared to the stop limit orders or the One-Cancels-the-Other (OCO) orders (see chapter 4.6). In addition, the limit of a stop limit order does not play a role for the trigger priority. In the following, stop market orders, stop limit orders, stop trailing orders and OCO orders are all referred to as stop orders.

Buy and sell stop orders of the same instrument can be thought of as saved on the book on two separate lists sorted by stop limit and priority time ("stop order book"). Buy orders with the lowest stop limit are listed first on the buy stop order list. Sell orders with the highest stop limit are listed first on the sell stop order list. When two stop orders have the same stop limit, the older order is listed first.

When several stop orders of both lists (Buy and Sell) can be triggered, they are triggered one after the other in a round-robin processing. The first stop order of the buy stop order list is triggered first. Then the first stop order of the sell stop order list is triggered, and then the second stop order on the buy stop order list and so on.

It is also possible that stop orders in more than one instrument are triggered in one transaction, e.g. in state change transactions, in mass quote transactions or due to synthetic matching. The lists of triggered buy or sell stop orders are then be created for each of the affected instruments, and the above-described round-robin processing is extended to the stop order lists of all affected instruments. I.e., first the first buy stop order of the first instrument is triggered, and then the first sell stop order of the first instrument, then the first buy stop order of the second instrument, and so on until all stop orders that are the first on their respective list are triggered. Then the procedure continues with all stop orders that are second on their respective list.

It is possible that the execution of a triggered stop order leads to the triggering of additional stop orders. In the case of synthetic matching, this could happen even in a different instrument. In such a situation, the additional stop orders are immediately added to their respective lists of triggered stop orders, and they are immediately considered in the round-robin processing.

The processing continues until all stop orders have been triggered in all the instruments. Any new incoming orders or quotes are processed only afterwards.

Example 4-3:

Assume the following stop order lists for two FESX instruments. Assume further that in this example, the numeric order IDs happen to reflect the sequence of order entry and thus the time priority of the orders. (Note however that in general, T7 does not guarantee such a correlation.)

FESX Jun27				FESX Sep27			
Buy Stop Orders		Sell Stop Orders		Buy Stop Orders		Sell Stop Orders	
Order ID	Stop Limit	Order ID	Stop Limit	Order ID	Stop Limit	Order ID	Stop Limit
1	3253	5	3256	4	3244	2	3246
3	3255	6	3256	8	3245	7	3245

Assume that a match event with trade prices of 3255 for FESX Jun27 and of 3245 for FESX Sep27 occurs, such that all listed stop orders are triggered.

The triggering of the stop orders would be processed in the sequence: 1, 5, 4, 2, 3, 6, 8, and 7.

4.4 Trailing Stop Orders

4.4.1 TSO order functionality

Trailing Stop Orders (TSO) are supported for cash markets only.

Trailing Stop Orders behave like Stop Orders but having an absolute or relative distance between the stop limit and the current reference price called trailing amount. Trailing Stop Orders can be entered only as "Market".

The stop limit of a Sell (Buy) Trailing Stop Order adjusts automatically according to the trailing amount as long as the reference price rises (falls), the trailing stop limit rises (falls) by the trailing amount. If the reference price falls (rises), the trailing stop limit remains the same. A Sell Trailing Stop Order is triggered when the reference price equals the trailing stop limit or falls below. A Buy Trailing Stop Order is triggered when the reference price reaches or exceeds the trailing stop limit.

Customers are informed about adjusted stop limits via broadcast within a certain time interval.

4.4.2 Trailing Stop Orders in Continuous Trading

In *Continuous Trading*, the stop limit of a Sell (Buy) TSO adjusts automatically according to the trailing amount as long as the reference price rises (falls), the trailing stop limit rises (falls) by the trailing amount. If the reference price falls (rises), the trailing stop limit remains the same.

A Sell TSO is triggered, when the reference price equals the trailing stop limit or falls below. A Buy TSO is triggered when the reference price reaches or exceeds the trailing stop limit.

4.4.3 Trailing Stop Orders in Retail Early and Late Trading

During the Retail Early and Late Trading Phases, the trailing stop limit of TSO orders – provided they are marked with Retail trading capacity and are not restricted to Main Trading Hours – is adjusted based on the price determined in the Retail auction (Retail Call phase).

4.4.4 Trailing Stop Orders in Continuous Auction with Specialist

The trailing stop limit (TSO limit) is monitored in T7 and updated according to Specialist's Standard/Matching quotes with quantity > 0:

When the ask quote limit plus the trailing amount is smaller than the stop limit of a Buy TSO, the stop limit is updated to the ask quote limit plus the trailing amount.

When the bid quote limit minus the trailing amount is greater than the stop limit of a Sell TSO, the stop limit is updated to the bid quote limit minus the trailing amount.

In *Continuous Auction with Specialist*, a Sell TSO order is triggered when the bid limit of the Specialist's Matching Quote is equal or below the TSO limit. A Buy TSO order is triggered when the ask limit of the Specialist's Matching Quote is equal or above the TSO limit. If a TSO order is triggered by a Matching Quote, it participates as a market order in the current price determination procedure.

The Specialist is not able to modify a TSO order.

4.5 Iceberg Orders

4.5.1 Overview

The Iceberg Order is an order type supported for cash instruments only.

Iceberg orders are large limit orders with quantities only partially visible in the order book. An iceberg order is characterized by its total order quantity and the peak quantity, which represents the visible part of the order. Each time that the visible part of an iceberg order is fully executed, it is refilled from the hidden part. The refill quantity can be configured to be random within predefined limits. The refill cycle is repeated as long as there is a hidden quantity left to be executed.

4.5.2 Iceberg Order Maintenance

An iceberg order always provides a limit price and can be entered with an order validity of GFD, GTC or GTD.

No order restrictions are supported for iceberg orders.

In addition to standard order attributes like buy or sell side, total order quantity, limit price etc. the following iceberg order specific attributes are entered by the user:

- Initial display quantity.
- Random low quantity.
- Random high quantity.

The random low quantity and random high quantity are optional but either both have to be specified or none. If the random low quantity is specified, it must be less than or equal to the random high quantity.

The iceberg order necessarily has to meet a certain size given by the *Minimum Iceberg Volume* and the *Minimum Peak Volume*. Both values are amounts defined in the trading currency of the instrument. That means the total order quantity multiplied by the limit price must be greater or equal to *Minimum Iceberg Volume* and the initial display quantity multiplied by the limit price must be greater or equal to *Minimum Peak Volume*. Furthermore, if present, the random low quantity multiplied by the limit price must be greater or equal to *Minimum Peak Volume*.

If the *Maximum Iceberg Ratio* is defined, the initial display quantity and the total order quantity are validated accordingly, i.e., the ratio of the total order quantity and the initial display quantity must not exceed the defined *Maximum Iceberg Ratio*, same applies for the ratio of total order quantity and random low quantity, if present.

An iceberg order cannot be modified to become a non-iceberg order and vice versa.

Increasing the total order quantity of an iceberg order leads to a new priority timestamp. Reducing the total order quantity has no impact on the iceberg order's time priority.

The modification of the initial display quantity of an iceberg order is processed as follows:

- The increase results in a recalculation of the display quantity and a new time priority.
- The decrease never changes the time priority. A decrease of the initial display quantity to a value higher or equal to the current display quantity does not change the display quantity. A decrease to a value lower than the current display quantity results in a reduced display

quantity.

A change of the limit price is processed like a new incoming iceberg order, i.e., new time priority and new display quantity.

4.5.3 Determination of the Display Quantity

Upon iceberg order entry the display quantity is set to the minimum between the initial display quantity entered by the user and the remaining unmatched open order quantity.

The display quantity of iceberg orders is refreshed from the remaining open order quantity when the former display quantity is fully executed. Refreshing the display quantity is regarded as a new order entry from a time priority point of view.

If the random low quantity and the random high quantity are not specified, the new display quantity is always the initial display quantity. If the remaining open order quantity is smaller than the initial display quantity, then the remaining quantity is displayed.

If the random low quantity and the random high quantity are specified, a peak refill of the iceberg order is processed with a random quantity between the random low quantity and the random high quantity. When the remaining open order quantity is smaller than the calculated random quantity then the remaining open order quantity is displayed.

4.5.4 Matching

The display quantity of a book iceberg order behaves as an order. Each time the displayed quantity is replenished from the hidden part of the order and the hidden part is reduced, the order receives a new priority timestamp.

The open order quantity of the iceberg order participates in an uncrossing procedure. This is also true for volatility auctions. After the end of the uncrossing, if the open order quantity is not fully executed, the display quantity is set to the minimum between the value of the display quantity before the start of the auction and the remaining unmatched open order quantity.

4.6 One-Cancels-the-Other Orders

4.6.1 OCO Order Functionality

A One-Cancels-the-Other (OCO) order is an order that combines the behavior of a regular limit order with that of a stop market order.

An OCO order has both a limit price and a stop limit. On entry, it first behaves exactly like a regular limit order. It can match like a regular limit order, and it contributes to the published market data.

The stop limit defines a trigger condition just as for stop orders. Once the trigger condition is fulfilled, the OCO order behaves like a stop market order, i.e., it receives a new priority timestamp and is converted to an incoming market order. The limit price does not apply anymore. When several stop orders and OCO orders are triggered, T7 does not distinguish between stop orders and OCO orders when working out the sequence of processing.

An OCO order that fulfills the trigger condition on entry is rejected by the system. I.e., contrary to stop orders, immediate conversion to regular market orders is in general not supported for OCO orders.

Though the name One-Cancels-the-Other may suggest otherwise, T7 treats an OCO order as one single order, and not as two orders that are linked. This is also reflected by an OCO order having only one Exchange Order ID that does not change throughout its lifetime, and specifically not when the OCO order is triggered.

4.6.2 OCO Order Maintenance

OCO orders are mandatorily entered with a limit price and with a stop limit. Both the limit price and the stop limit must be valid prices in respect of the rules for limit prices as outlined in chapter 4.1.1.

On entry, the stop limit and the limit price are validated as follows, and entry of the OCO order is rejected, if any of these conditions is not fulfilled:

- The stop limit of a buy OCO order must be higher than the best available buy limit.
- The stop limit of a sell OCO order must be lower than the best available sell limit.
- The stop limit of a buy OCO order must be higher than its limit price.
- The stop limit of a sell OCO order must be lower than its limit price.

The best available limit is normally given by the limit price of the best limit order on the order book side. For the case of synthetic matching, its definition is given in the chapters on synthetic matching and pricing in the *T7 Functional Reference Part 2*.

The same condition is checked for the modification of an OCO order.

The Price Reasonability Check and the Extended Price Range Validation apply to the limit price of an OCO order in the same way as for a regular limit order.

An OCO order loses its priority when its limit price is modified, when its stop limit is modified or when its quantity is increased.

Validations that are specific to market orders, as e.g. the validation against a market order specific order size limit, are in the same way applied to OCO orders on entry.

OCO orders can be entered with an order validity of GFD, GTC or GTD. The entered order validity continues to apply after the order is triggered.

4.6.3 OCO Order Maintenance in Continuous Auction with Specialist

The processing of OCO orders in the *Continuous Auction with Specialist* trading model is slightly different. The Specialist is not able to modify an OCO order. T7 is monitoring the OCO order and performs the “cancelling”, i.e., triggering, when the OCO stop limit is reached. In the *Continuous Auction with Specialist* trading model, a Matching Quote can trigger the “cancelling”. If the OCO order is triggerable by the Matching Quote, it immediately participates in price determination as a market order. Otherwise, it participates “uncancelled” with its regular limit.

4.7 Book-Or-Cancel Orders

Book-Or-Cancel (BOC) orders are orders that are never directly executed on entry.

BOC orders, which could be partially or fully executed upon entry, are immediately deleted without execution. BOC orders that are not executable on entry are accepted and written to the order book.

It is possible to modify a BOC order in the order book. If the BOC order crosses the current spread and is eligible for execution due to the modification, the BOC order is deleted.

BOC orders are only valid with a limit and without any other order restriction other than BOC. BOC market orders are not supported.

Set Up Information:

For Xetra, BSE, MSE, and WBAG with its partner exchanges orders with attribute BOC are only allowed in the instrument state Continuous, i.e., BOC orders cannot be entered during Auctions. Sitting BOC orders are deleted in the state transition to Auction.

4.8 Closing-Auction-Only Orders

Closing-Auction-Only orders are orders that are active only in the instrument states Closing Auction and Closing Auction Freeze. In all other instrument states, they are inactive, i.e., they can be entered, modified or deleted, but they are not available for matching, and they do not contribute to the published market data.

When the instrument enters the Closing Auction state, all Closing-Auction-Only orders become automatically active, and they receive a new priority timestamp. The Closing-Auction-Only orders participate then in the closing auction as any regular order.

Unexecuted Closing-Auction-Only orders are not automatically deleted by T7 after the Closing Auction is terminated. Instead, they become inactive.

Set Up Information:

Closing-Auction-Only orders are available for Eurex, Xetra, BSE, MSE, and WBAG with its partner exchanges. EEX has no closing auction for its products and therefore does not accept Closing-Auction-Only orders.

Closing-Auction-Only orders can be market orders or limit orders.

4.9 Opening-Auction-Only Orders

Opening-Auction-Only orders are similar to closing-auction-only orders, i.e., they are active only in the instrument states Opening Auction and Opening Auction Freeze. In all other instrument states, they are inactive, i.e., they can be entered, modified or deleted, but they are not available for matching, and they do not contribute to the published market data.

When the instrument enters the Opening Auction state, all Opening-Auction-Only orders become automatically active, and they receive a new priority timestamp. The Opening-Auction-Only order participates in the opening auction as any regular order.

Unexecuted Opening-Auction-Only orders are not automatically deleted by T7 after the Opening

Auction is terminated. Instead, they become inactive. Note however that after the opening auction, further entry of Opening-Auction-Only orders with validity for the same day only, is prevented.

Opening-Auction-Only orders can be market orders or limit orders.

Set Up Information:

Opening-Auction-Only orders are available for Eurex, Xetra, BSE, MSE, and WBAG with its partner exchanges, i.e., these orders are not supported for EEX instruments.

4.10 Auction-Only Orders

Auction-Only orders are orders that are active only in the instrument states Opening Auction or Opening Auction Freeze, Intraday Auction or Intraday Auction Freeze and Closing Auction or Closing Auction Freeze. In all other instrument states, they are inactive, i.e., they can be entered, modified or deleted, but they are not available for matching, and they do not contribute to the published market data.

When the instrument enters one of the above-mentioned states, all Auction-Only orders become automatically active, and they receive a new priority timestamp. The Auction-Only order participates in Opening-, Intraday- or Closing Auction states as any regular order.

Unexecuted Auction-Only orders are not automatically deleted by T7 after an Auction is terminated. Instead, they become inactive.

Auction-Only orders can be Market orders or Limit orders.

Set Up Information:

Auction-Only orders are available for Eurex, Xetra, BSE, MSE, and WBAG with its partner exchanges only, i.e., these orders are not supported for EEX instruments.

4.11 Intraday-Auction-Only Orders

Intraday-Auction-Only orders are orders that are active only in scheduled Intraday Auctions. In all other instrument states – including opening, closing, or volatility auctions – they are inactive, i.e., they can be entered, modified or deleted, but they are not available for matching, and they do not contribute to the published market data.

When the instrument enters a scheduled Intraday Auction, all Intraday-Auction-Only orders become automatically active, and they receive a new priority timestamp. The Intraday-Auction-Only order participates in scheduled Intraday Auctions as any regular order.

Unexecuted Intraday-Auction-Only orders are not automatically deleted by T7 after an Auction is terminated. Instead, they become inactive.

Intraday-Auction-Only orders can be Market orders or Limit orders.

Set Up Information:

Intraday-Auction-Only orders are available for Xetra, BSE, MSE, and WBAG with its partner exchanges only, i.e., these orders are not supported for Eurex and EEX instruments.

4.12 Special-Auction-Only Orders

In *Continuous Auction with Specialist* trading model, for instruments determined by the management board (e.g. German federal bonds or subscription rights), the Specialist performs one Special Auction per trading day. Orders can be marked with the order restriction *Special Auction*, so that they take part only in the price determination of this Special Auction, and not in any other price determination. The Specialist triggers the Special Auction price determination by sending a Matching Quote with the respective attribute.

[Set Up Information:](#)

A Special Auction is required only for certain instruments of Deutsche Börse Frankfurt.

4.13 Midpoint Orders

For Xetra Midpoint trading, there is a special order type *Midpoint*, and a special optional order attribute *Sweep* flag. Together, they define two order subtypes:

- The Midpoint order. Order Type *Midpoint*, with *Sweep* flag not set.
- The Midpoint Sweep order. Order Type *Midpoint*, with *Sweep* flag set.

For details, please see section 8.3 on Xetra Midpoint.

4.14 Main Trading Hours Orders

Main Trading Hours orders are orders that are active only in the instrument states of the main trading phase, i.e., from Opening Auction to the Closing, including Trade-at-Close. In all other instrument states, they are inactive, i.e., they can be entered, modified or deleted, but they are not available for matching, and they do not contribute to the published market data.

When the instrument enters the main trading phase, all Main Trading Hours orders become automatically active, and they receive a new priority timestamp.

Unexecuted Main Trading Hours orders are not automatically deleted by T7 after Closing. Instead, they become inactive.

Main Trading Hours orders can be market orders or limit orders.

[Set Up Information:](#)

Main Trading Hours orders are available for Retail orders in Deutsche Börse Xetra.

4.15 Auction Volume Discovery Orders

Regular Market and Limit orders in the trading model Continuous Trading with Auctions can be entered as Auction Volume Discovery (AVD) orders, with a restriction for either the Opening, or the Intraday, or the Closing auction. These orders are entered as inactive and become active only in a specific AVD uncrossing immediately after the auction uncrossing of either the Opening, or the Intraday, or the Closing auction. At the end of the day, AVD orders will be deleted. They do not participate in Trade-at-Close.

In the AVD uncrossing, AVD orders are matched at the auction price, either with other AVD orders, or with the surplus of the auction uncrossing. Participants can opt out from taking part in an AVD uncrossing with their non-AVD orders. The Limit price of an AVD order has no impact on the price of the AVD uncrossing, its only purpose is to act as a cap (for Buy orders) or floor (for Sell orders).

It is possible to delete AVD orders or surplus orders during the AVD uncrossing, but the orders are kept in a pending delete state and are removed only after the end of the AVD uncrossing, if they have not been removed by execution in the AVD uncrossing.

AVD orders offer a Broker Internalization mechanism: Traders (brokers) can add an Internalization ID to their AVD orders. AVD Orders from the same Business Unit (participant ID) and with identical Internalization ID are matched with the highest priority during the AVD uncrossing.

AVD orders are matched with a volume-time priority and according to the following order: First, AVD orders marked for Broker Internalization, then orders of the auction surplus, then all other AVD orders. Partial matches are allowed.

After the AVD uncrossing, the AVD orders will become inactive again. Only in case of an AVD order for Intraday auctions, the AVD order might become active again, if there is an exceptional, unscheduled second Intraday auction during the same day.

If no auction price is determined, or if the auction results in an auction price without turnover (APWT), then no AVD uncrossing will take place. If an auction is extended by a volatility interruption, or by an extended volatility interruption, then the AVD uncrossing will take place after the end of this volatility interruption at the price determined in the volatility interruption.

AVD Orders will neither participate in *Continuous* trading nor in the call phase and price determination of the respective auctions. When AVD orders are activated in the AVD uncrossing after the auction price determination, they will be executed immediately in the Central Limit Order Book. Consequently, no AVD order book information will be published to the market participants before an AVD uncrossing. All trades conducted in the AVD uncrossing will be published immediately. AVD orders that were not fully executed in the respective AVD uncrossing will be marked as *Inactive* once again. Only the participant who entered an AVD order receives the order information as private information.

AVD orders can be entered only as Good-for-Day orders, with Trading Capacities Agency, Riskless Principal, or Proprietary. AVD orders cannot be entered as IOC, FOK, or BOC orders. They can be persistent or non-persistent. There is no Self-Match Prevention (SMP) for AVD orders. In PTRL, AVD orders are counted for the on-book limits.

[Set Up Information:](#)

[Auction Volume Discovery Orders are available in Deutsche Börse Xetra.](#)

4.16 Order Profiles

The T7 system uses Order Profiles to define per market which orders and order restrictions can be entered and used. These Order Profiles are based on the Order Profile Categories.

4.16.1 Order Profile Categories

All orders that are supported by T7 fall in exactly one of the following Order Profile Categories:

- Regular Limit and Market orders.
- Auction-Only Orders (AO).
- Opening-Auction-Only Orders (OAO).
- Intraday-Auction-Only Orders (IAO).
- Closing-Auction-Only Orders (CAO).
- Special-Auction-Only Orders (SAO).
- Iceberg Orders.
- Book-Or-Cancel Orders (BOC).
- Stop Orders.
- One-Cancels-the-Other Orders (OCO).
- Trailing-Stop Orders (TSO).
- Midpoint (Sweep) Orders.

T7 does not support orders that fall in more than one of these categories. Please note that Order Profile Categories and order restrictions are not the same. Though certain Order Profile Categories are based on an order restriction, these order restrictions are not reserved only to these Order Profile Categories. The relationship of Order Profile Categories and order restrictions is defined in the Order Profiles.

Example 4-4:

It is not possible to enter an OCO order with a BOC restriction.

Furthermore, it is generally not possible to modify an order so that it changes the category in this list, except where explicitly stated otherwise in the description.

Example 4-5:

It is not possible to modify a Stop order to become an OCO order, nor to modify it to become a normal limit or market order. Nevertheless, it is possible to modify a Stop Limit order to become a Stop Market order.

4.16.2 Definition and Assignment of Order Profiles

The exchange defines these order profiles and enables or disables them for individual products.

When defining order profiles, the order types, order type variants and order restrictions play a role, which are used internally by T7. T7 distinguishes:

1. The following order types:
 - Regular.
 - Stop.
 - One-Cancels-the-Other (OCO).
 - Iceberg.
 - Midpoint.
2. The following order type variants:
 - Trailing Stop (TSO), variant of Stop.
3. The following optional order restrictions:
 - Auction-Only (AO).
 - Opening-Auction-Only (OAO).
 - Intraday-Auction-Only (IAO).
 - Closing-Auction-Only (CAO).
 - Main Trading Hours (MTH).
 - Book-Or-Cancel (BOC).
 - Auction Volume Discovery Order: Opening-Auction-Only (AVD OA)
 - Auction Volume Discovery Order: Intraday-Auction-Only (AVD IA)
 - Auction Volume Discovery Order: Closing-Auction-Only (AVD CA)
 - Midpoint MBO
 - Midpoint CRT
 - Midpoint MBO-CRT

Example 4-6:

A normal limit order has an order type Regular and no order restriction.

A Book-Or-Cancel order has an order type Regular and an order restriction BOC. An order with order type Stop and an order restriction BOC would theoretically be possible but has been explicitly excluded by the rules outlined in chapter 4.16.1.

Note that this notation has been designed to support in an optimal way the business functionality of T7 and therefore differs from the notation used in the external interfaces of the system, which follows the FIX standard.

Configuration Data:

Order profiles and the assignment of order profiles to Xetra and Frankfurt products are available in the Static Reference Data File on the Cash Market website, see chapter 1.2 Usage Notes.

4.16.3 The Order Profiles Definitions

The definitions of order profiles in T7 are divided into several tables or lists of Order Profiles, each of them covering certain exchanges or special cases. Currently, there are the following tables or lists of Order Profiles:

- For Eurex and EEX
- For Xetra, BSE, MSE, and WBAG with its partner exchanges

- For Xetra, the Midpoint orders
- For Frankfurt

4.16.3.1 Order profiles as applied by Eurex and EEX

Order Profile	Order Profile Attributes												
	Order types & Restrictions							Allowed Price Condition		Allowed Order Validity			
	Regular	Stop	OAo	AO	OCO	CAO	BOC	Limit	Market	IOC	FOK ²	Day	GTD GTC
Limit Order	✓							✓		✓	✓	✓	✓
Market Order	✓								✓	✓	✓	✓	✓
Regular Market Order – IOC	✓								✓	✓	✓		
Opening Auction Limit Order ³	✓		✓					✓				✓	✓
Opening Auction Market Order ³	✓		✓						✓			✓	✓
Auction Only Limit Order ³	✓			✓				✓				✓	✓
Auction Only Market Order ³	✓			✓					✓			✓	✓
Closing Auction Limit Order	✓					✓		✓				✓	✓
Closing Auction Market Order	✓					✓			✓			✓	✓
Book-Or-Cancel Order	✓						✓	✓				✓	✓
Stop Limit Order		✓						✓				✓	✓
Stop Market Order		✓							✓			✓	✓
One-Cancels-the-Other Order					✓			✓				✓	✓

Set Up Information:

Eurex supports stop market and stop limit orders, OCO orders, BOC orders and Closing-Auction-Only orders exclusively for futures products, but not for options products. Opening-Auction-Only, Auction-Only, and Closing-Auction-Only orders are supported for futures and options. Eurex does not support FOK orders.

Please note that EEX supports FOK orders, but does not support Opening-Auction-Only and Auction-Only orders.

² EEX only, not Eurex

³ Eurex only, not EEX.

4.16.3.2 Order profiles as applied by Xetra, BSE, MSE, and WBAG with its partner exchanges

Order Profile	Order Profile Attributes																				
	Order Types & Restrictions															Allowed Price Condition		Allowed Time Validity			
	Regular	Stop	Iceberg	OCO	TSO	AO	OA	IAO	CAO	MTH	BOC	Midp	AVD OA	AVD IA	AVD CA	Limit	Market	IOC	FOK	Day	GTD/GTC
Regular Limit Order	✓									✓			✓	✓	✓	✓		✓	✓	✓	✓
Regular Market Order	✓									✓			✓	✓	✓		✓	✓	✓	✓	✓
CAO Limit Order	✓								✓							✓				✓	✓
CAO Market Order	✓								✓								✓			✓	✓
OA Limit Order	✓						✓									✓				✓	✓
OA Market Order	✓						✓										✓			✓	✓
Auction Only Limit Order	✓					✓										✓				✓	✓
Auction Only Market Order	✓					✓											✓			✓	✓
Intraday Auction Limit Order	✓							✓								✓				✓	✓
Intraday Auction Market Order	✓							✓									✓			✓	✓
Book-Or-Cancel Order	✓										✓					✓				✓	✓
Stop Limit Order		✓								✓						✓				✓	✓
Stop Market Order		✓								✓							✓			✓	✓
One-Cancels-the-Other Order				✓						✓						✓				✓	✓
Iceberg Order			✓							✓						✓				✓	✓
Trailing Stop Order		✓			✓					✓							✓			✓	✓

4.16.3.3 Order profiles as applied by Xetra, for Midpoint orders

Order Profile	Order Profile Attributes																		
	Order Types & Restrictions													Allowed Price Condition		Allowed Time Validity			
	Reg ular	Stop	Ice berg	OCO	TSO	AO	QAO	IAO	CAO	BOC	Midp	MBO	CRT	Limit	Mark et	IOC	FOK	Day	GTD/GTC
Midpoint Limit Order											✓			✓		✓	✓	✓	✓
Midpoint Market Order											✓				✓	✓	✓	✓	✓
Midpoint Limit Order MBO-CRT											✓	✓	✓	✓				✓	✓
Midpoint Market Order MBO-CRT											✓	✓	✓		✓			✓	✓
Closing Auction Midpoint Limit Order									✓		✓			✓				✓	✓
Closing Auction Midpoint Market Order									✓		✓				✓			✓	✓
Opening Auction Midpoint Limit Order							✓				✓			✓				✓	✓
Opening Auction Midpoint Market Order							✓				✓				✓			✓	✓
Auction Only Midpoint Limit Order						✓					✓			✓				✓	✓
Auction Only Midpoint Market Order						✓					✓				✓			✓	✓
Intraday Auction Only Midpoint Limit Order								✓			✓			✓				✓	✓
Intraday Auction Only Midpoint Market Order								✓			✓				✓			✓	✓
Midpoint Book-Or-Cancel Limit Order										✓	✓			✓				✓	✓

4.16.3.4 Order profiles as applied by Deutsche Börse Frankfurt

Order Profile	Order Profile Attributes										
	Order types & Restrictions					Allowed Price Condition		Allowed Order Validity			
	Regular	Stop	TSO	OCO	SA	Limit	Market	IOC	FOK	Day	GTD/GTC
Limit Order	✓				✓	✓				✓	✓
Market Order	✓				✓		✓			✓	✓
Stop Limit Order		✓				✓				✓	✓
Stop Market Order		✓					✓			✓	✓
OCO Order				✓		✓				✓	✓
TSO Order		✓	✓				✓			✓	✓

For instruments traded in subscription, only Limit and Market orders are allowed.

4.16.4 Complex Instrument Orders

T7 accepts for complex instruments only limit orders with any order validity. Market orders as well as orders with any specific order type (Stop Orders, OCO Orders) or restriction (Closing-Auction-Only Orders, BOC Orders) are not supported for complex instruments.

Technically, T7 assigns order profiles independently per instrument type. However currently, the only order profile supported for complex instruments in any product is the Limit Order profile.

4.17 Fill-Or-Kill Orders

Fill-or-Kill (FOK) orders combine an All-or-None execution restriction with an Immediate-or-Cancel order validity. Nevertheless, FOK is traditionally implemented by trading systems as an order validity of its own, and T7 follows this tradition (see chapter 4.1.3).

On FOK order entry, T7 checks whether the FOK order is fully executable or not. If yes, then the FOK order is executed, and if not, then the FOK order is deleted without any execution. The partial execution of an FOK order is thus prevented.

In the context of synthetic matching in derivatives markets, T7 will detect some but not all available synthetic matching possibilities when checking an FOK order for full executability. It is therefore possible that an FOK order is deleted without execution for reasons of insufficient executable quantity on the orderbooks, even though a full execution would have been possible with a perfect synthetic matching.

Set Up Information:

Fill-or-Kill orders are available for all cash markets on T7 and for EEX.

4.18 Multi Order Fill-or-Kill

The Multi Order Fill-or-Kill functionality is a special order entry request to enter more than one limit order for different simple and complex instruments across products (with same capacity group⁴) simultaneously with the condition that all orders are either completely executed or rejected simultaneously and all at once.

This allows participants to realize business opportunities which depend on the execution of more than one order, excluding the risk of executing only some but not all orders needed.

Set Up Information:

Multi Order Fill-or-Kill is enabled for Nodal, only.

Example 4-7:

A trader wants to execute 25 MW, where the price in combined 1 MW and 5 MW is better than the price in the outright 25 MW book.

<i>Instrument</i>	<i>Bid</i>	<i>Ask</i>
AAA JAN27 1 MW	7 @101.1	3 @ 101.2
AAA JAN27 5 MW	20 @101.0	25 @ 101.3
AAA JAN27 25 MW	25 @100.9	50 @ 101.4

⁴ Capacity groups are technical groups of products belonging to same partition and used for load balancing purposes. There can be multiple capacity groups on a single partition.

So, instead of a single Sell order 25 @100.9 in AAA JAN27 25 MW, a Multi Order FOK is entered with:

AAA JAN27 1 MW Sell 5 @101.1

AAA JAN27 5 MW Sell 20 @101.0

4.19 Cross Announcement

The Cross Announcement functionality serves to announce a Cross trade or a pre-arranged trade to the market. A cross trade is a trade where a trading participant trades against an own order in the order book. In a pre-arranged trade, orders from at least two participants are executed against each other as previously negotiated.

When a user enters a cross announcement, specifying the instrument and the quantity, T7 publishes this information to the market. The corresponding matching orders must then be entered manually within a certain time frame.

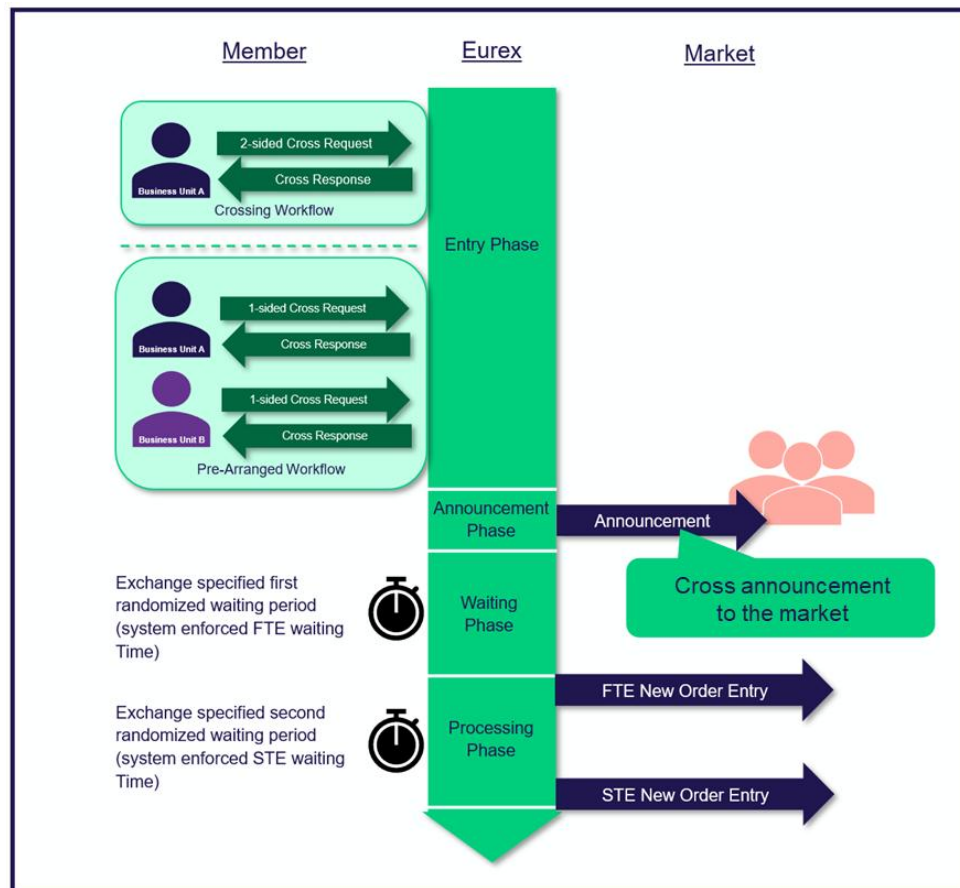
4.19.1 Automated Crossing Procedure

The automated cross procedure allows the entry of both to-be-crossed orders at once, or, in case of a pre-arranged trade allows the entry of a one-sided order which is linked to the corresponding counterpart side.

Set Up Information:

The Automated Cross Announcement is available for Derivatives markets only.

The automated cross request allows the entry of both to-be-crossed orders at once, or, in case of a pre-arranged trade, allows the entry of a one-sided order, which is linked to the corresponding counterparty side.



The automated Cross request workflow

The three phases of the automated Cross request workflow in detail:

Entry Phase:

- To start a Cross trade, the participant sends a two-sided Cross order. Thus, both sides of the Cross trade are entered at once before the Cross trade will be announced to the market.
- For a pre-arranged trade, both counterparties send opposing one-sided Cross orders, that are linked in T7 with a linkage ID and the counterparty information that will be agreed upon outside of T7 and added to the orders.
- The counterparties may determine via the Automated Crossing Procedure which order will be entered first ("first to enter", FTE), while the second order ("second to enter", STE) will be entered subsequently. Certain further attributes are made available to cater for execution restrictions and risk mitigation. The counterparties may also determine whether an order should stay in the order book after partial execution via the IOC or GFD configuration.

Announcement Phase:

- An announcement to the market about the impending cross- or pre-arranged trade is triggered automatically once the request has been validated by T7.

Waiting Phase:

- A mandatory, exchange specified, randomized waiting period will start at the time of the announcement. During the waiting phase, the market can participate by entering opposing orders or quotes in the order book before the orders are submitted. After the first waiting phase is over, the “first to enter order” is entered into the order book. During the first waiting phase, no order maintenance will be possible.

Processing Phase:

- Directly after the first order was entered, the Processing Phase begins.
- Eurex may specify a second waiting period before the “second to enter order” will be entered into the order book. In case this second waiting period is not set, both orders are directly entered one after another into the order book.
- Order Maintenance is now possible.
- FTE and STE will interact with the order book as any other order, i.e., no special treatment is foreseen.

5. Quotes

5.1 Quote Characteristics

A Quote is a special kind of order with some specific functionality and a minimal set of attributes. In general, quotes are used for market-making purposes.

A quote in T7 belongs to the session through which it had been entered. A session can only have one buy quote and one sell quote per instrument. If a quote is entered through a session that already has a quote on the same side of the same instrument's order book, then the old quote is replaced by the new one.

Typically, quotes are sent as pairs of buy and sell quotes, also referred to as Double-Sided Quotes. T7 supports also the entry of Single-Sided Quotes, where only a buy quote or only a sell quote is entered for an instrument. Note that T7 does not link a session's buy quote and the same session's sell quote for the same instrument but rather treats them as independent orders. It does not matter here, whether the buy quote and the sell quote have been entered together – as double-sided quote – or individually.

A quote must have a limit price. There is no such thing as a market quote without a price limit.

Quotes do not carry clearing related information. However, trades resulting from the execution of quotes may be automatically enriched with such information by T7. See chapter 12.2.3 for details.

Quotes carry the MiFID II related attributes for “execution decision within firm”, “investment decision within firm” and Liquidity Provision Activity.

5.2 Quotes in Cash Markets

In cash markets, the usage of quotes depends on the trading model. Different quote types are allowed in different trading models:

- *Continuous Trading with Auctions* trading model:
 - Quotes in the trading model *Continuous Trading with Auctions* provide a binding price offer to the market for a certain quantity.
- *Continuous Auction with Specialist* trading model:
 - Standard Quotes in the trading model *Continuous Auction with Specialist* provide a non-binding price offer to the market for a certain quantity.
 - Matching Quotes provide a binding price offer in an Auction resp. a Freeze phase and immediately trigger a price determination.
 - Price without turnover Quotes (PWT quotes) set a new price in the market without a turnover.
 - For the *Special Auction*, there are special PWT and matching quote types.
- *Continuous Auction with Market Maker* trading model:
 - Indicative Quotes, if allowed by the exchange, provide a non-binding price offer to the market.
 - Standard Quotes in the trading model *Continuous Auction with Market Maker* provide a binding price offer to the market for a certain quantity.

- Matching Quotes provide a binding price offer in an Auction resp. a Freeze phase and immediately trigger a price determination.
- Price without turnover Quotes (PWT quotes) set a new price in the market without a turnover.

Price without turnover Quote in Continuous Auction with Market Maker trading model:

When a PWT quote is entered in a sold-out situation and there are only buy orders in the book, then the PWT price will be published, and the instrument remains in the Pre-Call Phase. But if there are buy and sell orders in the book, then the PWT price will not be published, and a Call phase may be triggered.

Price without turnover Quote in Continuous Auction with Specialist trading model:

Specialists can enter a PWT quote during Pre-Call and Freeze. The bid price of the quote is distributed as Last Trade Price via Market Data interfaces.

A PWT quote price determination is possible, if no executable order book situation exists:

- There are no orders in book at all.
- When orders are in the book,
 - buy and sell limit orders are not executable against each other within bid and ask price of entered PWT quote.
 - no triggered buy and sell orders are available (stop limit, stop market, TSO).
 - buy or sell (stop) limit order is not executable against the limit of a stop limit order (not the stop limit) and limit of an OCO order.
 - stop orders are not triggerable at the bid and ask limit of the PWT quote and are not executable.
 - OCO order with its limit is not executable against other limit of OCO and limit orders.

A PWT quote is not possible in following cases:

- One or more buy and sell limit orders (including limit of OCO order) are executable against each other within bid and ask price of entered PWT quote.
- One or more buy and sell limit orders with opposite side as Stop market order, Trailing Stop order or OCO order is/are executable within the bid and ask price of entered PWT quote.
- One or more TSO/OCO orders are triggered and become executable within the bid and ask price of entered PWT quote.

Set Up and Config Information:

On Deutsche Börse Frankfurt, the price determination for a PWT quote is configurable.

The price determination out of a PWT quote can be based on the bid price or on the midpoint of the bid and ask of the PWT quote. In the latter case, the calculated midpoint is rounded to the next tick; if single-sided quotes are allowed, i.e., PWT quotes with bid side only, then the bid side is taken.

For Deutsche Börse Frankfurt, including structured products listed at Deutsche Börse Frankfurt, the PWT quote price determination is currently based on the bid price.

5.3 Quote Ownership

A quote in T7 is owned by the session through which it had been entered. An old quote is replaced by a new one, if the new quote is sent through the session that owns the old quote.

Each quote has also an owning user, which is the one that entered the quote, but the owning user is only of legal relevance. That means that if a user owns a quote on the book and then enters a new quote for the same instrument through a different session, the new quote is added alongside the old one, rather than replacing it.

However, if a user enters a quote through a session that has already a quote in the order book, then the old quote is replaced by the new quote, even if the old quote had been entered by a different user. Please note that, as an exception, a Retail Liquidity Provider quote can co-exist with a non-Retail Liquidity Provider quote in one session.

Example 5-1:

There is a quote in the book with owning session 1000 and owning user XYZLOLTR001.

- 1. User XYZLOLTR001 enters a new quote through the same session 1000.
→ The old quote is replaced by the new quote.*
- 2. User XYZLOLTR002 enters a new quote through the same session 1000.
→ The old quote is replaced by the new quote.*
- 3. User XYZLOLTR001 enters a new quote through the other session 1001.
→ The old quote remains in the book alongside the new quote, because they are owned by different sessions.*

Replacing a quote is thus only possible through the session that owns the quote. T7 does not support a way to replace a quote that is owned by a different session.

5.4 Quote Maintenance

5.4.1 The Mass Quote Request

Users maintain individual quotes using Mass Quote Requests. A mass quote request is a list of requests to enter, replace or delete individual quotes. The T7 Mass Quote Request supports both the entry of single-sided buy or sell quotes, and the entry of pairs of buy and sell quotes.

Note that the entry of a single-sided buy (sell) quote, i.e., without specifying the sell (buy) side in the request, has no effect on an existing sell (buy) quote that had been already in the book, except in cases described in chapter 5.4.7. Specifically, the sending of a single-sided quote is not interpreted as a request to delete an existing quote on the other side.

Traders may supply a Mass Quote Identifier when entering quotes, which takes the place of the client order identifier known for orders. The mass quote identifier identifies the mass quote request and is therefore the same for all quotes contained in the same mass quote request.

In the instrument state Continuous, the entry or the replacement of a quote implies that T7 attempts to execute the incoming quote against the order book. The sequence of the processing of the individual requests in the mass quote request is of relevance only in the case that quotes are executed on entry, e.g. in the context of market maker protection (see the corresponding remarks in chapter 5.6.4) or in the context of synthetic matching (see the chapters on synthetic matching in the *T7 Functional Reference Part 2*).

The requests that are contained in a single mass quote request are processed by T7 in a two-step approach. In the first step, all quotes are logically entered into the book, thereby replacing any old quotes. In the second step, T7's matching engine picks out those quotes that improved the best price on their order book, and attempts to match them as incoming quotes, one after the other, in the sequence, in which they occurred in the mass quote request. In case of a double-sided quote, the buy side is processed before the sell side.

5.4.2 Quote Entry

A user may enter quotes in Quote Entry Mode.

When a new quote is entered in quote entry mode for a specific side in a specific instrument, and if there is no quote belonging to the same session already on that side of the order book for that instrument, then the new quote is simply added.

If there is already an old quote belonging to the same session on that side of the order book for that instrument, then the new quote replaces the old quote. The entered quantity of the new quote becomes the open quantity, while the accumulated executed quantity of the new quote is initialized to zero.

Nevertheless, the new quote receives the priority timestamp of the old, replaced quote, if the limit price remains the same, and if the new quantity is not higher than the old quote's remaining open quantity. In all other cases, the entry time of the quote defines its time priority.

Please note that, as an exception, a Retail Liquidity Provider quote can co-exist with a non-Retail Liquidity Provider quote in one session.

5.4.2.1 Single-sided quote rejection policy

An exchange may require that quotes are entered as pairs of buy and sell quotes ("double-sided quotes"). There are various possibilities:

- Single-sided quote not allowed:
The entry of a single-sided quote is excluded. If one quote side of a double-sided quote is rejected, then the other quote side is rejected, too.
- Single-sided quote on entry allowed:
The entry of a single-sided quote is allowed. If one quote side of a double-sided quote is rejected, then the other quote side is rejected, too.
- Single-sided quote supported:
The entry of a single-sided quote is allowed. If one quote side of a double-sided quote is rejected, then the other quote side can be entered into the order book, if not functionally or technically rejected.

Configuration Data:

The information, whether quotes for a product are required to be double-sided, is published by T7's Reference Data Interface in the product snapshot message (RDI field name: QuoteSideIndicator). The information is also available in the Trading Parameters File, which is part of the Products and Instruments Files for Eurex and EEX on the Eurex website, see chapter 1.2 Usage Notes.

Set Up Information:

WBAG requires double-sided quotes for all products.

T7 does not require double-sided quotes for any product of Xetra, Eurex, and EEX. However, double-sided quotes may still be necessary to fulfill market maker performance requirements.

Deutsche Börse Frankfurt allows single-sided standard quotes in Continuous Auction with Specialist trading model.

5.4.3 Quote Modification

Alternatively, T7 supports the entry of quotes in Quote Modification Mode, which adheres to rules that resemble those valid for order modification.

When a new quote is entered in quote modification mode for a specific side in a specific instrument, and if there is no quote belonging to the same session already on that side of the order book for that instrument, then the new quote is not added by T7.

If there is already an old quote belonging to the same session on that side of the order book for that instrument, then the new quote replaces the old quote. The entered quantity of the new quote becomes the total quantity of the new quote, and the accumulated executed quantity of the old quote is taken over as starting value for the accumulated executed quantity of the new quote.

The open quantity of the new quote is then derived as the total quantity of the new quote minus the accumulated executed quantity of the old quote.

In case that the total quantity of the new quote is not greater than the accumulated executed quantity of the old quote, the request to enter a new quote is automatically interpreted as a request to delete the old quote, and no new quote is entered.

Like in quote entry mode, the new quote receives the priority timestamp of the old replaced quote, if the price remains the same, and if the new open quantity is not higher than the old quote's open quantity. In all other cases, the entry time of the quote defines its time priority.

Please note that, as an exception, a Retail Liquidity Provider quote can co-exist with a non-Retail Liquidity Provider quote in one session.

5.4.4 Quote Deletion on Request

It is possible to delete an individual quote that rests on the order book. The deletion request identifies the quote by side and instrument and assumes that the quote is meant that belongs to the same session as the one through which the deletion request is sent. It is not possible to delete an individual quote through a different session.

In addition to the deletion of individual quotes with a mass quote request, T7 supports also a special Delete All Quotes Request. With the help of this request, it is possible to cancel all own quotes in a product as well as all quotes in a product of another session belonging to the same business unit, or to cancel all quotes in a product over all sessions of a business unit at once. Such a request can be sent through any session that belongs to the same business unit.

During an auction freeze instrument state, just as for orders, T7 cannot delete quotes, as this would change the order book situation. Like for orders, a request to delete a quote during an auction freeze state is accepted by T7, but the quote is merely marked as pending deletion. The handling of quotes that are marked as pending deletion is identical to the handling of orders in this situation as described in chapter 4.2.3.

5.4.5 Automatic Quote Deletion

Quotes are deleted automatically in the following situations:

- The instrument enters the state Restricted, or the state Closed.
- The product enters the state Halt.
- A Volatility Interruption occurs (depending on the exchange configuration).
- The owning session gets disconnected.
- In the case of certain risk protection events that require the deletion of all orders and quotes.
- A technical back-end partition overload condition has been detected.
- A technical failure requires a restart of the central matching engine.
- In trading model *Continuous Auction with Market Maker*, if the market model allows Indicative quotes, Matching quotes will be deleted after a price determination or the expiry of an auction. Standard and Indicative quotes will not be deleted on these occasions.
- Retail Liquidity Provider quotes are deleted on auction or volatility interruption start.

Quotes are always considered as having an order validity of Good-For-Day. However, since quotes are always deleted when the instrument enters one of the instrument states Restricted or Closed, they are in any case already deleted when the End-Of-Day processing starts.

Set Up Information:

Quotes as well as non-persistent orders entered for Xetra, BSE, MSE, or WBAG with its partner exchanges are not deleted when the instrument state moved to the state Volatility Auction.

5.4.6 Quote Deactivation

It is possible to deactivate or reactivate all quotes of a session that belong to the same product. The deactivation or reactivation is always valid for all the quotes of a session for the specified product. It is not possible to deactivate or reactivate individual quotes.

The scope of a deactivation and of the market maker protection parameters set by the market maker (see chapter 5.6) must be the same, i.e., quotes are activated or deactivated, and market maker protection limits are defined for all quotes in a product.

The deactivation or reactivation of the quotes of a session can be requested through any session that belongs to the same business unit. Additionally, an automatic deactivation of quotes is triggered in case of a violation of a Market Maker Protection limit (see chapter 5.6).

When a session's quotes are inactive, it means that they do not participate in matching and T7 does not consider them for the calculation of market prices. However, inactive quotes can still be maintained just like active quotes. A trader can thus continue to perform normal quote maintenance, like adding, modifying, and deleting individual quotes, while all the session's quotes for the product, including new ones remain inactive, even if all the price validations are done for inactive quotes in the same way as for active quotes.

It is possible to deactivate and to delete all quotes of a session per product at the same time. In this case, all further mass quote requests for this session and product will be rejected until the session will be activated again for quoting for this product.

Note: It is preferable to consider inactive quotes or active quotes as being a status of the owning session in respect to a specific product, and this status of the session then affects the behavior of its quotes. In this way, it is easy to understand that quotes being active or inactive is a status that exists independently from quotes actually being on the order book. If a trader deactivates quotes, deletes them all afterwards and enters new quotes later on, then these new quotes are still inactive as long as the trader did not send a reactivation request.

When the quotes of a session are reactivated, T7 does the following for each quote one after the other:

1. The priority timestamp of the quote is updated.
2. The Extended Price Range Validation is applied, if the necessary conditions are fulfilled (see chapter 6.3). If the quote exceeds the allowed price range, it is deleted. There is however, no Price Reasonability Check for quotes being reactivated.
3. If the instrument state is Continuous and the quote is executable, the quote is matched as if it were an incoming quote. (Please note, that BOC quotes are not handled as BOC quotes anymore once they entered the orderbook. So, they are no BOC quotes anymore on de- and reactivation.)
4. From then on, if the quote has still an open quantity, it is treated as any active quote on the order book.

T7 processes quote reactivation requests asynchronously, i.e., with a minor delay, for products where PLP is not active. This has the effect that a quote reactivation request might be surpassed by another order or quote maintenance request that arrived shortly later. There is no delay to the reactivation request in case there are no quotes in the book. Concerning quote deactivation requests, they are processed immediately upon arrival, and the same as it is done for all other order or quote maintenance requests.

In general, T7 processes a buy quote before the sell quote of the same instrument. This can be of relevance e.g. if the reactivation of a buy quote which turns out to be immediately executable, triggers

a buy market order on the book (chapter 7.3.2.4), before the corresponding sell quote is reactivated. At that moment, the session's sell quote for the same instrument is not yet reactivated and thus not yet eligible to match against the triggered market order.

For futures products with synthetic matching, the sequence in which the quotes of different instruments are reactivated can be relevant. T7 follows these principles:

- Quotes of simple instruments are always processed before quotes of complex instruments, i.e., futures contracts before futures spreads.
- For simple instruments, quotes for an instrument with an earlier contract date are processed before quotes for an instrument with a later contract date.
- The sequence of processing of instruments that cannot be distinguished by the above rules merely follows the value of the technical instrument identifier in T7. The assignment of technical instrument identifiers by T7 does not follow any rule.

The status of a session's quotes being active or inactive is persistent. It survives all situations when quotes are deleted intra-day, including session disconnect and a technical failure of the central Matching Engine. Quotes being entered after such an event are still inactive, if quotes had been inactive before the event. However, at the start of day, all sessions are set to have active quotes, even if they had their quotes being inactive at the end of the previous trading day.

5.4.7 Book-Or-Cancel Quotes

Book-or-Cancel (BOC) quotes are either written to the order book without matching on entry or rejected. BOC quotes that are not executable on entry are accepted and written to the order book. BOC quotes, which could be partially or fully executed on entry, are immediately rejected without execution.

If one side of a quote is rejected because of Book-or-Cancel, then the other side of this quote is rejected, too, if it exists in this quote request. A sitting quote, potentially overwritten by the incoming BOC quote, is deleted even in case of a rejection of the BOC quote.

Please note that after a Book-or-Cancel quote has been written to the order book, it can trigger market orders. This occurs if the quote spread is lower than the market order matching range. In this case, the BOC quote is passively matched after it has been written to the order book.

The exchange can enable the possibility of entering BOC quotes per product.

[Set Up Information:](#)

Book-or-Cancel quotes are enabled for Eurex.

5.4.8 Safeguards

Find detailed information about safeguards of all kinds in chapter 14.

The user may provide a Cross ID which prevents the matching against identically tagged orders or quotes of the same business unit by means of the self-match prevention functionality of type A, see chapter 7.7.

In any case, T7 applies the following rules in order to prevent unwanted matching between quotes of the same session or to remove unwanted quotes from the order book:

1. A crossed double-sided quote is rejected by T7.
2. If a new single-sided quote is executable against the same session's old quote on the contra-side of the same instrument's order book, then the old quote is deleted by T7 and the new quote is added. Here the decision if a quote is executable or not does not depend on whether the instrument state would actually allow the execution of the quotes but is entirely based on the limit price of the buy quote being greater than or equal to the limit price of the sell quote.
3. When many quotes are sent in one mass quote request, they are processed in sequence. T7 prevents a new quote matching against an old quote that is due to be replaced or to be deleted by the same request. This explicitly includes cases of synthetic matching of quotes in different instruments. However, matching against an old quote in a different instrument is not prevented, if that old quote is not due to be replaced or deleted by the same request.
4. If the entry or the deletion of an individual quote is rejected by T7, then T7 rejects both sides of the new quote and it deletes both sides of the session's old quote in the affected instrument.

5.5 Quote Validations

5.5.1 Standard Limit Price Validations

The limit price of a quote is subject to the same validations as the limit price of an order:

- It must comply with the price step table that is relevant for the instrument.
- The entering user shall request that the limit prices of the quotes are validated with the Price Reasonability Check. See chapter 6.2 for the details of the Price Reasonability Check.
- Quotes that are not validated with the Price Reasonability Check are tested with the Extended Price Range Validation, provided that this validation is enabled for the product. See chapter 6.3 for the details of the Extended Price Range Validation.
- For *Continuous Auction with Specialist* trading model there is no price validation for Standard and PWT quotes.

5.5.2 Minimum Quote Size

When a quote is entered, the total quantity of a quote must be greater than or equal to the Minimum Quote Size, which is defined individually for each instrument/product by the exchange. The quantity being relevant here is the total quantity of the quote and not its open quantity (see chapter 4.1.2 for the definitions of these terms).

Due to partial executions, the open quantity of a quote may fall below the value of the Minimum Quote Size, but this is not considered to be a violation of the Minimum Quote Size. It is even possible to enter a new replacing quote in Quote Modification Mode (see chapter 5.4.3), leaving the open quantity below the Minimum Quote Size, as long as the total quote size remains greater than or equal to the Minimum Quote Size.

The Minimum Quote Size may have a different value during fast market and stressed market conditions. Typically, during a Fast Market, quoting requirements are relaxed, and so the Minimum Quote Size is likely to be lower.

If a quote was successfully entered during a Fast Market, and then the Fast Market ends, the total quantity of that quote is at that point no longer re-tested. It may remain in the order book, even if its total quantity is less than the Minimum Quote Size outside a Fast Market. However, any new quotes are tested again against the value of the Minimum Quote Size outside a Fast Market, even if entered in Quote Modification Mode.

Configuration Data:

The information about minimum quote sizes is published by T7's Reference Data Interface in the product snapshot message (RDI group message name: QuoteSizeRules).

Set Up Information:

Deutsche Börse Xetra and Frankfurt do not apply a Minimum Quote Size.

5.5.3 Maximum Quote Spread

If quotes must be entered as double-sided quotes, then they are accepted only if the price difference between the buy side and the sell side of the quote does not exceed the Maximum Quote Spread. See chapter 6.4 for the detailed rules including the calculation of the Maximum Quote Spread.

In the cash trading model *Continuous Auction with Market Maker*, null-spread quotes are allowed for the quote types *Indicative*, *Price Without Turnover* (PWT), *Matching*, and in the cash trading model *Continuous Auction with Specialist*, null-spread quotes are allowed for the quote types *Price Without Turnover* (PWT), *Matching*. Entering a Null Spread Matching quote in Pre-call will be declined.

5.5.4 Quoting Periods

Quoting Periods define the periods in which a quote can be submitted in T7. In case that Quoting Periods are set on instrument level, a Starting and an Ending Time are defined for an instrument, which are included in the published reference data. Quotes submitted outside of defined Quoting Periods are rejected. The same is true for requests for quote.

Set Up Information:

Currently in use for Deutsche Börse Frankfurt in trading model Continuous Auction with Market Maker and in trading model Continuous Auction with Specialist.

5.6 Market Maker Protection

5.6.1 Overview

T7 offers a Market Maker Protection (MMP) mechanism, which can prevent too many quotes of a market maker matching during a short period of time. The exchange enables or disables this feature on a product basis.

Configuration Data:

The information, whether market maker protection is enabled for a product, is available in the Trading Parameters File, which is part of the Products and Instruments Files for Eurex and EEX on the Eurex website, see chapter 1.2 Usage Notes.

Set Up Information:

For Xetra, Frankfurt, BSE, MSE, and WBAG with its partner exchanges the Market Maker Protection is disabled.

Market Maker Protection is not supported for Inter-Product Spreads.

For the MMP, T7 calculates for each session and each product, several statistics on the traded volumes of the session's quotes. There are four different types of statistics available, the Volume statistic, the Delta statistic, the Vega statistic, and the Percent statistic. A detailed description of these statistics is available in chapter 5.6.2.

For the calculation of the statistics, only trades are taken into account that occurred in a time window before the last trade. The size of this time window is configured by the market maker.

The traded volumes that are counted for quotes in complex instruments are always the traded volumes in the leg instruments.

Example 5-2:

A market maker has configured market maker protection for the product OESX. A quantity of 10 of a buy quote in a Call Butterfly standard options strategy for the product OESX is executed. The result of this is a quantity of 10 being bought in the first leg, a quantity of 20 being sold in the second leg and a quantity of 10 being bought in the third leg. The Volume statistics counts all traded leg volumes and is therefore increased by 40 (=10+20+10). Thus, the session's Volume statistics is increased by 40 for the product OESX.

To make use of this mechanism, a market maker must define a set of MMP limit values that correspond to the four different statistics described above, and the size of the time window must be defined so that it can be applied for the calculation of the statistics. The market maker may define one such set of limit values to be applied on all quotes of one session. Alternatively, the limits can be defined for all sessions at once on BU level. The market maker can freely choose whether any limits are defined at all, and if so for which statistics.

When a quote is executed, T7 checks whether the owning session has relevant limits defined and if so, it compares the limits with the corresponding traded volume statistics. If one of the limits is exceeded, T7 automatically triggers a quote deactivation that applies to the same scope as the violated limit. In addition, if a product wide limit is exceeded, then the quotes are deactivated.

In case limits for both, for the entire BU *and* for an individual trading session, are defined, the following scenarios may occur:

- The limit set for the BU gets exceeded, but the limit for the individual trading session in a product not:
Then all quotes of the BU, including the quotes for the specified trading session in the product, are deactivated.
- The limit set for the BU is still active, but the limit for the individual trading session in a product gets exceeded:
Then all quotes which belong to the individual trading session for a product are deactivated, but all other quotes belonging to other sessions of the BU remain in the order book.

Participants can optionally choose an additional deletion of their quotes, after they have become deactivated by a Market Maker Protection event. Then, the entry of new quotes will be rejected.

Example 5-2 continued:

Assume that the market maker that owns the Call Butterfly quote had configured market maker protection for the product OESX. The configured Volume limit is 50 for OESX and the time window size is 2 seconds. One second before the trade in the Call Butterfly instrument, the market maker's quote in the simple instrument OESX Jun27 3250 C traded 20 lots, which brought the session's Volume statistic to 20. The new trade of the Call Butterfly quote increases the Volume statistic to 60 (=20+40). This exceeds the configured limit of 50. The session's quotes for OESX are deactivated.

There is no specific reset action required to allow the session to bring its quotes back into the market after they have been deactivated due to an exceeded MMP limit. A normal reactivation request is enough. The market maker protection limits are again valid immediately after the reactivation.

5.6.2 MMP Statistics Definitions

The four MMP statistics represent four different methods of counting the traded contracts.

The Volume statistics counts the total number of traded contracts.

The Delta statistics holds for futures the difference between the number of bought futures contracts and the number of sold futures contracts. For options, T7 first computes the difference between the number of bought call contracts and the number of sold call contracts. Then it computes the difference between the number of bought put contracts and the number of sold put contracts. Finally, it calculates the Delta statistics as the difference between the two differences.

The Vega statistics holds the number of bought contracts minus the number of sold contracts. It is available only for options, because for futures there would be no difference to the Delta statistics.

For Options, the Volume, Delta and Vega statistics can thus be represented as formulas:

$$\text{Volume} = \#BC + \#BP + \#SC + \#SP$$

$$\text{Delta} = (\#BC - \#SC) - (\#BP - \#SP)$$

$$\text{Vega} = (\#BC + \#BP) - (\#SC + \#SP)$$

where #BC is the number of bought call contracts, #BP is the number of bought put contracts, #SC is the number of sold call contracts and #SP is the number of sold put contracts.

For Futures, these statistics can be represented as follows:

$$\text{Volume} = \#BF + \#SF$$

$$\text{Delta} = \#BF - \#SF$$

$$\text{Vega} = \text{N/A}$$

where #BF is the number of bought futures contracts, and #SF is the number of sold futures contracts.

The Delta statistics and the Vega statistics can be negative. Therefore, it is the absolute values of the

Delta statistics and of the Vega statistics that are checked against their respective limits.

The Percent statistic sums up a value that is calculated by comparing the traded volume of the quote to the original total size of the quote. For complex instruments, it is important to note that it is the traded volume of the quote in the complex instrument itself and not the traded leg volumes that are considered for the Percent statistics.

The idea of the Percent statistic is to have a volume statistics that however gives equal weight to quotes with different quantities in different instruments.

The Percent statistics is defined as:

$$\text{Percent Statistic} = \sum \text{Round} (100 \times \text{Traded Quantity} \div \text{Total Quote Size})$$

where the summing is done over all the executions of the session's quotes.

The calculated percentage value for each executed volume is rounded to the nearest integer value (e.g. 2.4% is rounded to 2%, and 2.5% is rounded to 3%), before being added to the Percent statistic.

Example 5-3:

A session's Percent limit for simple instruments in the product OESX is set to 240. Consider three quotes being executed in the sequence as given by the following table.

Side and Instrument	Total quote size	Open at time of execution	Size of execution	Added to Percent statistic	Resulting Percent statistic
Buy OESX Jun27 3200 C	100	100	100	100 %	100 %
Sell OESX Jun27 3050 P	50	50	40	80 %	180 %
Buy OESX Jun27 3400 C	30	20	15	50 %	230 %
Sell OESX Jun27 3050 P	50	10	10	20 %	250 %

With the last execution, the Percent limit of 240 is exceeded and quotes are deactivated.

Note that the sell quote in the instrument OESX Jun27 3050 P is executed twice. The example illustrates how the Percent statistic compares the quantity being executed to the total quote size rather than to the open quantity at the moment of execution.

5.6.3 Maintenance of the Limits

The MMP limit sets are permanently stored and applied by T7, until they are modified. They can be changed at any moment while the system is accessible.

After a limit modification, there is no check if the new limit is already exceeded. The new values are taken into account only at the next time that a quote is matched.

The MMP limits are not obligatory. If there is no limit set, T7 does no limit check. If limits are set, but an individual limit has a zero value, the corresponding statistic is not checked by T7. In this way, it is possible to make use of only one or only some of the limits.

The time interval can be set to zero, however this means that the MMP is effectively switched off, even if some limits are defined. It does specifically *not* mean that the MMP reacts if and only if the matching of a single incoming order already exceeds a limit.

5.6.4 Additional Rules for MMP

5.6.4.1 Exclusion of uncrossing trades

The MMP takes into account only trades that have been executed during the instrument state Continuous. Auction uncrossing trades and in general uncrossing trades when entering the Continuous state, are not taken into account for the MMP statistics. However, trades resulting from a subsequent stop order triggering are taken into account, the same as trades resulting from feeding orders as part of the uncrossing procedure, which is done, in some cases for complex instruments while entering the instrument state Continuous as described in chapter *Synthetic Uncrossing: Feeding of Futures Spread Orders* in the *T7 Functional Reference Part 2*.

5.6.4.2 Reset of statistics after a limit violation

A statistics value is reset to zero when the corresponding limit is exceeded. If a limit is exceeded, and the affected quotes are reactivated faster than the size of the time window, the trades before the limit were exceeded are no longer taken into account.

5.6.4.3 Deactivation only after the processing of the incoming order is complete

A deactivation due to MMP takes place only after the matching of an incoming order or quote has been completed. If in a synthetic matching situation, an incoming order matches synthetically against several of a session's quotes in different instruments, all these executions are performed, and the quote deactivation is done only afterwards, even if it was already the first of the executions that led to a violation of an MMP limit.

5.6.4.4 Deactivation during the mass quote request processing

Quotes that are sent together in one mass quote request are in this context considered independent incoming orders. Any quote of the incoming mass quote request can be matched and cause a violation of a limit of the session that entered the mass quote request. The consequence of this is a quote deactivation, immediately after the processing of the matching quote and before the processing of the remaining quotes of the mass quote request.

Example 5-4:

A market maker enters a mass quote request with double-sided quotes in the following sequence:

- | | | | |
|----|----------------------------|---------------|----------------|
| 1. | OESX Jun27 3300 C | Buy 100@14.00 | Sell 100@14.60 |
| 2. | OESX Jun27 3350 C | Buy 100@5.20 | Sell 100@5.80 |
| 3. | OESX Jun27 3400 C | Buy 100@1.80 | Sell 100@2.30 |
| 4. | OESX BUL Jun27 3300 – 3400 | Buy 100@11.90 | Sell 100@12.60 |

The market maker's quote machine did not calculate the prices well and so all the sell quotes in the mass quote request happen to be fully executable on entry. The market maker had set 100 as a limit for the Volume statistics of simple instruments and again 100 as a limit for the Volume statistics of standard options strategies. The market maker did not set any product wide limit.

The first quote matches fully with a quantity of 100, which is equal to the limit but does not exceed the limit. Then the second quote matches fully with a quantity of 100, which brings the session's Volume statistic for simple instruments to 200, thus exceeding the corresponding limit of 100. An immediate deactivation for the session's quotes in simple instruments is triggered. The third quote enters the book but is already inactive and so does not match. The fourth quote is not inactive since it does not belong to a simple instrument. It matches fully, which brings the Volume statistics for standard options strategies to 200, a volume of 100 coming from each leg. This finally triggers a deactivation for the session's quotes in standard options strategies.

5.6.4.5 Deactivation during the processing of a reactivation

The situation is similar for the reactivation of the quotes of a session. Quotes being reactivated are processed one after the other like independent incoming orders. That means that if the reactivation of quotes leads to an execution of such a quote, then this might cause an MMP limit to be violated and thus to an immediate renewed deactivation of the quotes. The reactivation processing is, in this case, no longer continued for the remaining quotes that had not yet been processed.

5.7 Request for Quote

A Request for Quote (RfQ) is a request that is directed either to the entire market or to specific market makers, which indicates trading interest in a specific instrument. An RfQ can be single-sided or double-sided, and it can optionally carry a quantity.

The exchange determines by product whether RfQs are supported.

5.7.1 RfQ Generation

5.7.1.1 User Requested RfQs

Generally, an RfQ can be generated on request of a user of the system.

A user request for an RfQ is accepted only if all of the following conditions are fulfilled:

- The instrument state is Continuous or an auction state.
- There had been no other RfQ for the same instrument shortly before.
- The same user has not entered more than a maximum number of requests for an RfQ for instruments of the product in the last time.
- The spread between the best buy price and the best sell price is not narrow enough, or alternatively, the quantity of the best price is not high enough.

The actual values of the involved time windows, maximum numbers, price spreads and minimum quantities, to be applied for the above conditions depend on configuration parameters that are set by the exchange on a product basis. The values may also differ during fast market and stressed market conditions, when quoting requirements may be more relaxed, and thus conditions for the acceptance of requests for an RfQ are stricter.

5.7.1.2 Automatic RfQs

For derivatives markets only, T7 supports furthermore an automatic generation of RfQs. The exchange determines by product whether automatic RfQ generation is supported.

If supported for the product, an automatic RfQ is generated, if an incoming market order does not match on entry at all and is written to the order book. Furthermore, an automatic RfQ is generated, if a Stop Market order or an OCO order is triggered and is not immediately matched, not even partially, when being triggered.

Automatic RfQs are generated only if all of the following conditions are fulfilled:

- The instrument state is Continuous.
- There had been no other RfQ for the same instrument shortly before.
- The spread between the best buy price and the best sell price is not narrow enough, or alternatively, the quantity of the best price is not high enough.

An automatic RfQ is always double-sided and carries no quantity.

5.7.2 Distribution of RfQ Messages

T7 supports the following distribution models of RfQ messages:

1. Public distribution: The RfQ messages are distributed to all market participants via the public market data interface.

2. Private distribution to assigned Designated Sponsors: The RfQ messages are distributed to the Designated Sponsors assigned to the concerned instrument via the trading interface.
3. Private distribution to assigned Market Makers and Designated Sponsors: The RfQ messages are distributed to the Designated Sponsors and Market Makers assigned to the concerned instrument via the trading interface.
4. User defined distribution: The submitter of an RfQ specifies per request the receiving group (or combination of groups) of RfQ according to the groups defined in items 1 to 3 (all participants, Designated Sponsors, Designated Sponsors or Market Makers).

For derivatives markets, only public distribution is supported.

For cash markets, the exchange configures which distribution model is supported for an instrument.

5.7.3 Quote Request Solution

In the *Continuous Auction for Market Maker* and in the *Continuous Auction for Specialist* trading models, the Quote Request Solution (QRS) offers market participants the opportunity to request a prompt and full execution of an order at a defined or better price.

During the main trading phase in continuous auction, the following applies for the QRS:

- Market participants can ask the Market Maker or Specialist for an indicative private quote submitting the ISIN, the quantity they would like to trade and optionally the side (buy or sell) they intend to trade.
- The request is answered by the Market Maker or Specialist either with a quote response containing an adequate bid/ask with the available quantity (quantity 0 is allowed) or with an error message in case no current and adequate quote e.g. in terms of quantity is available. In case the Market Maker or Specialist does not answer, the market participant also receives an error message indicating that the time period for a response is exceeded.
- Having received an adequate answer from the Market Maker or Specialist, the participant may submit an order based on the quote request response, referred to as QRS order.
- In the *Continuous Auction for Market Maker* trading model, the QRS order triggers an auction Call phase. If there is no execution in this Call phase, the QRS order is deleted at the end of the Call phase.
- All the messages, i.e., the quote request, the quote response, and the order upon a quote response refer to each other via a unique *Quote ID* that is set by the participant and which has to be unique per business unit and instrument during the business day.
It is important to notice that the *Quote ID* initially submitted in the QRS workflow in a RfQ differs in validation and uniqueness from the *Quote ID* submitted as (mass) quote identifier by a Specialist / Market Maker for which no validation is done in T7. As such, the field used is the same however, yet the associated functionality differs.
- The QRS order can either be fully executed according to the matching rules of the market model or not at all. In case the Market Maker's or Specialist's matching quote would result in a partial execution of the QRS order, the quote is rejected by T7.
- If not executed, the QRS order is deleted from the order book after the respective time period elapsed. This deletion is performed even if the order book is currently frozen.
- Any modification to the QRS order is rejected and only deletions are allowed.
- The exchange defines a maximum number of QRS quote requests which can be sent per BU in a product during the trading day.

- The quote request, the quote request response, and the order upon a quote response are marked with a timestamp and outdated after a certain time period.

In case of unsupported ISINs (e.g. instruments in subscription, instruments with a single auction only), QRS quote requests are rejected and returned with a respective error message.

6. Price Range Tables and their Applications

6.1 Price Range Table Basics

6.1.1 Functionality Overview

T7 makes extensive use of price range tables. The standard Price Range Tables are used to calculate price ranges that are applied for the following purposes:

- The Price Reasonability Check is used by traders to ensure the reasonability of their order's or quote's limit price on entry. It is described in chapter 6.2.
- The Market Order Matching Range helps to protect market orders by setting a limit to the trade price at which a market order is executable. The procedure is described in chapter 7.3.2.
- The Maximum Quote Spread Validation limits the allowed price spread between the buy side and the sell side of a double-sided quote, for products where double-sided quotes are mandatory. See chapter 6.4 for details.
- The Extended Price Range Tables are used by T7 to force the limit price of incoming orders and quotes to a crude price check, the Extended Price Range Validation, if they have not been validated by the Price Reasonability Check already. See chapter 6.3.

6.1.2 Calculation of Price Ranges

A price range table enables the calculation of a price range depending on a reference price. The table consists of a list of consecutive price intervals together with the absolute or percentage parameters to be applied for the calculation of the price range, in case the reference price falls into a certain price interval. The price intervals in the table are defined for positive prices. For negative reference prices, the price interval applicable for their absolute value (i.e., the same number without the minus sign) is used.

There are two parameters, the Absolute Price Range Parameter and the Percent Price Range Parameter. The price range is then calculated depending on the reference price as

$$\text{Price Range (Reference Price)} = APR + |\text{Reference Price}| \times \frac{PPR}{100}$$

where the values for the Absolute Price Range Parameter *APR* and the Percent Price Range Parameter *PPR* are taken from the table entry for the price interval that contains the reference price.

Price range tables contain only entries for positive reference prices. In case of a negative reference price, the absolute value of the reference price has to be used, i.e., the value without the minus sign.

During fast market and stressed market conditions, the price range calculated for the price reasonability check and the extended price range validation is increased according to the associated fast percentage:

$$\text{Price Range Fast} = \text{Price Range} \times \left(1 + \frac{\text{Fast Percentage}}{100}\right)$$

where *Price Range* is the price range being calculated as given above, and *Fast Percentage* is a parameter that depends on the product and may differ for the price reasonability check and the

extended price range validation.

A calculated price range is never rounded but applied with its exact value.

Example 6-1:

For the options series on the Nokia stock NOA3 that expire in the next 24 months, Eurex has set up the following standard price range tables:

Price Interval Start	Price Interval End	Absolute Price Range Parameter	Percent Price Range Parameter
0.00	1.00	0.10	0
1.00	5.00	0	10
5.00	maximum price	0.50	0

The corresponding Fast Market Percentage parameter is set to 100.

This enables a calculation of the price ranges for a few sample reference prices as follows:

Reference Price	Calculation	Resulting Price Range
-2.40	$0 + -2.40 \times 10 \div 100$	0.24
0.00	$0.10 + 0.00 \times 0 \div 100$	0.10
0.27	$0.10 + 0.27 \times 0 \div 100$	0.10
1.00	$0 + 1.00 \times 10 \div 100$	0.10
3.50	$0 + 3.50 \times 10 \div 100$	0.35
5.00	$0.50 + 5.00 \times 0 \div 100$	0.50
7.80	$0.50 + 7.80 \times 0 \div 100$	0.50

During a Fast Market, the values for the price range are doubled:

$$\text{Price Range Fast} = \text{Price Range} \times (1 + 100/100) = \text{Price Range} \times 2$$

6.1.3 Availability of Price Range Tables

Standard Price Range Tables and Extended Price Range Tables are set up by product and by instrument type. Standard Price Range Tables for simple instruments are even defined by instrument, as the price ranges may depend on the expiration of the instrument.

Standard Price Range Tables are always available for all products, while the Extended Price Range Validation and thus the related tables are not available for all products.

There is an independent version of the Extended Price Range Tables to be applied for the validation of stop limit orders that are not triggered on entry or modification.

Configuration Data:

The standard price range tables for a specific product are published by T7's Reference Data Interface in the product snapshot message (RDI group message name: PriceRangeRules).

The identifier of the relevant standard price range table for a specific instrument is then available in T7's Reference Data Interface's instrument snapshot message (RDI group message name: PriceRangeRules).

The value of the fast percentage parameter to be applied on a standard price range during a fast market or stressed market condition for derivatives markets, is published by T7's

Reference Data Interface in the product snapshot message (RDI field name:

FastMarketPercentage). It is also available in the Trading Parameters File, which is part of the Products and Instruments Files for Eurex and EEX on the Eurex website, see chapter 1.2

Usage Notes.

The extended price range tables as well as related information including the assignment of products to these tables, are available as part of the Products and Instruments Files for Eurex and EEX on the Eurex website, see chapter 1.2 Usage Notes.

6.2 Price Reasonability Check

When a user enters or modifies a limit order or enters a quote, the user has to perform a Price Reasonability Check on the limit price of the order or quote. If the price reasonability check fails, the order or quote is rejected. A user can authorize the limit by sending the order or quote once again without performing the price reasonability check.

T7 basically supports two different concepts of the Price Reasonability Check, one for derivatives market instruments, the other for cash market instruments. The Price Reasonability Check for the derivatives markets is based on the price range whereas the Price Reasonability Check for the cash markets is based on the volatility range. In addition to that, in the *Continuous Auction with Specialist* and in the *Continuous Auction with Issuer* trading models for cash instruments, the Price Reasonability Check is based on the price range. The three concepts are described in the following.

6.2.1 Price Reasonability Check based on the Price Range

6.2.1.1 Procedure

The price reasonability check for the derivatives markets is performed exclusively in the instrument state Continuous.

The check leads to a rejection of the order or quote, if the limit price of a buy order or quote exceeds a given reference price by more than the standard price range as given in chapter 6.1, or if the given reference price exceeds the limit price of a sell order or quote by that amount. The price range is always calculated on the basis of the reference price and not based on the limit price to be checked. I.e., the condition for rejection is

$$\text{Buy Limit Price} > \text{Reference Price} + \text{Price Range (Reference Price)}$$

or

$$\text{Sell Limit Price} < \text{Reference Price} - \text{Price Range (Reference Price)}.$$

It is possible that no reference price is available and that therefore the price reasonability check cannot be done. The user has the choice of whether in this case, the order or quote is rejected or

accepted without a price reasonability check.

6.2.1.2 Reference Price Determination

For the determination of the reference price, there is a standard procedure, and there is a non-standard procedure for the case that the condition for the standard procedure is not fulfilled. If neither procedure can be applied, then no price reasonability check is done.

Standard Procedure

In the Standard Procedure, the reference price is the best available price on the side that is opposite to the side of the order to be tested. I.e., for a buy order or quote, the reference price is the best sell price, and for a sell order or quote, the reference price is the best buy price.

The condition for the standard procedure to be applied is that both a best buy price and a best sell price are available and that the price difference between the best buy price and the best sell price must be smaller than or equal to the price range being applied.

The exception is if there is no best buy price available, then the smallest allowed limit price for the instrument is used instead of the missing best buy price. This is relevant for instruments that have a market price close to zero, and for which a limit price at or below zero is not admitted, like out-of-the-money option series.

The best buy price or best sell price are here understood as the best price as being published in the market data feed. Usually, this is the best limit price available on the order book. However, for synthetically traded products, this may be a synthetic price. See the chapters on synthetic matching and for the publication of synthetic prices in the *T7 Functional Reference Part 2*.

Non-Standard Procedure

If the above-mentioned price spread condition for the standard procedure cannot be fulfilled, then the Non-Standard Procedure is applied. For the non-standard procedure, an alternative reference price must be available. Depending on the product, this is either the last trade price or a theoretical price. If no such price is available, the previous day's settlement price⁵ is used instead. If neither a last trade price or theoretical price, nor the previous day's settlement price is available, then there is no alternative reference price available, and the non-standard price reasonability check cannot be performed.

The following table lists which price is being used as the reference price for the price reasonability check in the non-standard procedure. Here, BBP stands for Best Buy Price, and BSP stands for Best Sell Price. TP stands for the alternative reference price, i.e., the Last Trade Price or the Theoretical Price, whichever has to be applied, or in case of non-availability, the previous day's settlement price.

⁵ For Variance Futures and for Total Return Futures (see Functional Reference Part 2: Appendix on Variance and on Total Return Futures), the previous day's settlement price in trading notation is applied here.

BBP Available	BSP Available	Market Price Condition	Reference price to test incoming buy order	Reference price to test incoming sell order
Yes	Yes	$BBP \leq TP \leq BSP$	TP	TP
		$TP < BBP < BSP$	BSP	BBP
		$BBP < BSP < TP$	BSP	BBP
No	Yes	$TP \leq BSP$	BSP	TP
		$BSP < TP$	BSP	BSP
Yes	No	$BBP \leq TP$	TP	BBP
		$TP < BBP$	BBP	BBP
No	No	n/a	TP	TP

Please note that in the case of an order modification, the best price being applied in this chapter may be derived from the old limit price of the same order that is being modified. In the case of quote replacement, the best price may be derived from the old quote, which is being replaced by the new quote.

For stop limit orders that are not triggered directly on entry or modification, the reference price to be applied is the stop price of the order itself. The reason is that at the point of order entry, the stop price is the best guess for the market price prevailing at the yet unknown future point in time when the stop order will be triggered.

6.2.1.3 Product Settings

T7 allows the exchange to determine by product, whether the price reasonability check is supported at all, and which type of price is used in the non-standard procedure.

Configuration Data:

The values of the parameters that control the settings for the price reasonability check are available in the Trading Parameters File, which is part of the Products and Instruments Files for Eurex and EEX on the Eurex website, see chapter 1.2 Usage Notes.

6.2.2 Price Reasonability Check based on the Volatility Range

6.2.2.1 Procedure

For cash instruments, the price reasonability check applies to all instrument states where order maintenance is allowed for new or modified limit orders and quotes.

The price reasonability check has to be performed by the user. The price reasonability check validates that the new limit price does not exceed the volatility range. A user can authorize the limit exceeding the volatility range by sending the order or quote once again without performing the price reasonability

check. The volatility range is a special interval around the last trade price to prevent large deviations of execution prices.

Market orders are not considered for price reasonability check.

6.2.2.2 Validation Rules

With a given last trade price, the limit price of an order or quote is checked for buy/sell side as follows:

The incoming buy limit is not reasonable if

$$\text{Buy Limit Price} > \text{Last Trade Price} + \text{Volatility Range (Last Trade Price)}$$

The incoming sell limit is not reasonable if

$$\text{Sell Limit Price} < \text{Last Trade Price} - \text{Volatility Range (Last Trade Price)}.$$

6.2.3 Price Reasonability Check in Continuous Auction with Specialist / with Issuer

Due to the extreme price volatility of certain structured products one volatility-based wide price corridor is not sufficient. Therefore, different price corridors are cross-checked and confirmed by the exchange. The price range table is used to validate limit orders (as well as QRS orders, i.e., orders entered with *Quote/D*), stop limit orders as well as the matching quote of the Specialist / Issuer. The following rules apply:

Order Type	Order is rejected if ...
Buy Matching Quote	Buy price of MQ > Last Price + Price Range
Sell Matching Quote	Sell price of MQ < Last Price – Price Range
Limit Buy	Limit Price > Last Price + Price Range
Limit Sell	Limit Price < Last Price – Price Range
Stop* Buy	Trigger Price < Last Price – Price Range
Stop* Sell	Trigger Price > Last Price + Price Range
OCO Buy	Limit Price > Last Price + Price Range Trigger Price < Last Price – Price Range
OCO Sell	Limit Price < Last Price – Price Range Trigger Price > Last Price + Price Range

* Stop includes Stop Market, Stop Limit, Trailing Stop.

The corridors are trailing the Last Trade Price whenever it is updated along price determination per order execution or PWT quote entry.

Standard quotes and PWT quotes are excluded from the validation.

6.3 Extended Price Range Validation

T7 performs the Extended Price Range Validation on the limit price of the order or quote, if the following conditions are fulfilled:

- The Extended Price Range Validation is enabled for the product and the instrument type.
- The limit price of the order or the quote is not being checked with the price reasonability check, no matter if it is not done because it has not been requested or because the available market price information is not sufficient or because the check is disabled.
- In all instrument states where order maintenance is allowed (for cash), respectively in instrument state *Continuous* (for derivatives).

The Extended Price Range Validation leads to a rejection of the order or quote, if the limit price of a buy order or quote exceeds the reference price (for cash) respectively the best sell price (for derivatives) by more than the extended price range, or if the best buy price exceeds the reference price (for cash) respectively the limit price of a sell order or quote (for derivatives) by that amount.

6.3.1 Extended Price Range Validation for cash markets

The Extended Price Range Validation is based on the value for the price reasonability check, extended by a percentage value defined by the exchange. With a given last trade price, the limit price of an order or quote is checked for buy/sell side as follows:

The incoming buy limit is not reasonable if

$$\text{Buy Limit Price} > \text{Last Trade Price} + \text{Extended Price Range (Last Trade Price)}$$

The incoming sell limit is not reasonable if

$$\text{Sell Limit Price} < \text{Last Trade Price} - \text{Extended Price Range (Last Trade Price)}.$$

The extended price range can be skipped after contacting Market Operations in exceptional situations.

6.3.2 Extended Price Range Validation for derivatives markets

The Extended Price Range Validation is calculated as given in chapter 6.1. The extended price range is always calculated based on the best price to which the limit price is compared and not based on the limit price itself.

The condition for rejection is:

$$\text{Buy Limit Price} > \text{Best Sell Price} + \text{Extended Price Range (Best Sell Price)}$$

or

$$\text{Sell Limit Price} < \text{Best Buy Price} - \text{Extended Price Range (Best Buy Price)}.$$

The best buy price or best sell price are here understood as the best price as being published in the market data feed. Usually, this is the best limit price available on the order book. However, for synthetically traded products, this may be a synthetic price. See the chapters for synthetic matching and for the publication of synthetic prices in the *T7 Functional Reference Part 2*.

It is possible that there is no such best price to which the limit price of the order or quote should be compared. In this case, the Extended Price Range Validation cannot be done, and is skipped.

Stop limit orders can also be subject to the Extended Price Range Validation. However, there is a specific Extended Price Range Table for stop orders to be applied here. Furthermore, for those stop limit orders that are not triggered directly on entry or modification, the best buy price or the best sell price in the formula above is substituted with the stop price of the stop order itself. The reason is that at the point of order entry, this is the best estimate for the market price prevailing at the yet unknown future point in time when the stop order will be triggered.

6.4 Maximum Quote Spread Validation

If the exchange requires that quotes have to be entered as double-sided quotes, then single-sided quotes are rejected, and double-sided quotes are accepted only if the price difference between the buy side and the sell side of the quote does not exceed the Maximum Quote Spread.

See chapter 5.5.3 for related set-up information regarding individual exchanges.

The Maximum Quote Spread is determined either as being equal to the Price Range being calculated on basis of the price of the buy quote, or as being equal to the Price Range being calculated on basis of the price of the sell quote, whichever Price Range value turns out to be larger:

$$\text{Maximum Quote Spread} = \max[\text{Price Range (BuyQuote Price)}, \text{Price Range (Sell Quote Price)}]$$

The double-sided quote is rejected, if the quote spread is greater than the Maximum Quote Spread, i.e.:

$$\text{Sell Quote Price} - \text{Buy Quote Price} > \text{Maximum Quote Spread}$$

As an exception, the entry of a single-sided sell quote is admitted, even if double-sided quotes are mandatory, if the difference between the limit price of the sell quote and the minimum price of the instrument is smaller than the Maximum Quote Spread, i.e.:

$$\text{Sell Quote Price} - \text{Minimum Price} < \text{Maximum Quote Spread}$$

This is to allow the entry of single-sided sell quotes for out-of-the-money options, for which market makers may consider that even the minimum price is too high for a buy quote.

7. On-book Matching

7.1 Definitions

7.1.1 Orders and Quotes

For the calculation of the matching process, T7 treats orders and quotes identically. Therefore, throughout this chapter, the term order is generally applied to both orders and quotes.

7.1.2 Matching

Matching is the procedure of finding pairs or groups of orders that are executed against each other.

In its simplest form, there is one buy order and one sell order that are both executed at the same execution price and with the same quantity. However, in general, several orders on the buy side can be executed against several orders on the sell side. The execution price is the same for all involved orders and the accumulated executed quantity on the buy side must equal the accumulated executed quantity on the sell side. T7 informs the owners of the orders with an execution confirmation and then creates a trade and forwards this trade to the clearing system, resp. to the settlement system in case of non-CCP instruments.

The complete processing of e.g. an incoming order may then involve several such matches at the same or at different prices.

7.1.3 Direct Matching and Synthetic Matching

The matching of orders that all belong to the same instrument is called Direct Matching. In Synthetic Matching⁶, orders of different simple and complex instruments are executed against each other. T7 supports synthetic matching for futures spreads and for inter-product spreads.

Synthetic matching is described in the *T7 Functional Reference Part 2*. See the chapters on synthetic matching of futures spreads and on synthetic matching of inter-product spreads. This chapter describes direct matching.

7.1.4 Incoming Orders and Book Orders

The matching procedure makes a difference between Incoming Orders and Book Orders. Strictly speaking, an incoming order is an order that is in the process of being entered, and a book order is an order that is on the order book already.

In the context of matching, however, book orders are sometimes treated as incoming orders. These cases are

- Orders that are being modified such that the price is improved.
- Quotes that are reactivated.
- Market orders that are triggered (see chapters 7.3.2.3 and 7.3.2.4).
- Stop orders, TSO orders and OCO orders that are triggered (see chapters 4.3, 4.4 and 4.6).

⁶ The term Implied Matching is a widely used synonym for Synthetic Matching. Eurex applies the term Synthetic Matching. No subtle difference of meaning is intended.

- Futures spread orders and inter-product spread orders that are fed into the market after an uncrossing (see the chapters *Feeding of Futures Spreads Orders* and *Uncrossing of Inter-Product Spreads in the T7 Functional Reference Part 2*).

In this chapter therefore, the term *Incoming Order* is applied not only to actual incoming orders but extended also to book orders given in the above list.

7.1.5 Full Match and Partial Match

An order matches fully if its entire open quantity is executed. Since there is nothing left to match, a fully matched book order is removed from the order book, and a fully matched order that is in the process of being entered, is not written to the book.

Or an order matches partially, if not all its open quantity is executed. In this case, an order that was already on the order book remains on the order book, and an order that is in the process of being entered and is not an IOC order, is written to the order book. The quantity that was executed is removed from the open quantity and added to the accumulated executed quantity.

It is possible for a single order to get involved in multiple executions at different points in time. For example, an order may be partially executed upon entry, while the remaining open order remains in the order book. The open portion may then be executed a minute later, an hour later, or even days later.

7.1.6 Continuous Trading and Uncrossing

T7 supports essentially two different matching procedures:

1. Continuous Trading: In the instrument state Continuous, the matching engine of T7, attempts to execute an incoming order in the extended sense as described above, immediately against orders on the order book. The rules for Continuous Trading are described in chapter 7.2.1.
- Uncrossing: An auction phase usually ends with an uncrossing procedure that may result in an auction trade. Orders at both sides of the order book are executed against each other at one single auction price, so that afterwards the order book is uncrossed, i.e., there are no longer two orders left on the order book that can be executed against each other. For complex instruments, an uncrossing is done when the instrument state is switched to Continuous without going through an auction phase. The rules for uncrossing are described in chapter 7.2.2.

7.1.7 Order Allocation

Allocation is the procedure to distribute a given quantity among a group of recipients that are able to receive more than is available. In the context of matching, Order Allocation refers to the distribution of a quantity that is available for matching to several orders, the accumulated quantity of which exceeds the quantity that is available for matching.

T7 supports three different order allocation methods, which are described in detail in chapter 7.4. They are

- the Time allocation method,
- the Pro-Rata allocation method and
- the Time-Pro-Rata allocation method.

The exchange defines by product and by instrument type, which order allocation method is applied in continuous trading and which is applied in auction trades.

Please note that for Midpoint matching in the separate Midpoint order book a volume-time priority is applied.

Set Up Information:

Eurex generally applies the same allocation method for auction trades and in continuous trading. For most products, the Time allocation method is applied. The Time-Pro-Rata allocation method and the Pro-Rata allocation method are applied in the case of specific products, as e.g. the Time-Pro-Rata allocation method in case of the money market future FEU3, or the Pro-Rata allocation method in case of many stock options.

EEX and the cash markets Xetra, Frankfurt, BSE, MSE, and WBAG with its partner exchanges generally apply the Time Allocation method for all products.

Configuration Data:

The information about which order allocation method is applied is published by T7's Reference Data Interface in the product snapshot message (RDI group message name: MatchRules). It is also available in the Trading Parameters File, which is part of the Products and Instruments Files for Eurex and EEX on the Eurex website, see chapter 1.2 Usage Notes.

7.2 The basic matching procedures

There are several essentially different matching procedures supported by T7:

- Continuous Trading.
- Order Book Uncrossing (Auction).
- Quote-driven Order Book Uncrossing, as in *Continuous Auction* trading models.

7.2.1 Continuous Trading

Continuous trading is the matching procedure that is exclusively applied in the instrument state Continuous.

7.2.1.1 Matching Procedure in Continuous Trading

In continuous trading, the matching engine of T7 attempts to execute a single incoming order – “incoming” in the extended sense as explained in chapter 7.1 – against book orders on the other side of the order book of the same instrument.

To be executable against a book order, the incoming order must be:

- Either an order to buy at a price at or above the limit price of the sell book order,
- or
- An order to sell at a price at or below the limit price of the buy book order.

For market orders, there are special rules, which are explained in detail in chapter 7.3.

In T7, the procedure for matching an incoming order against several book orders, in any case follows a strict price priority. Please note that for Midpoint matching in the separate Midpoint order book a volume-time priority is applied.

The following steps are repeated by the matching engine of T7, for each available limit price level on the order book, until either the quantity of the incoming order is exhausted or until no more orders on the order book are executable against the incoming order:

1. It finds the best available limit price level on the side of the order book that opposes the incoming order. This is the highest price for the buy side and the lowest price for the sell side.
2. It distributes the remaining available quantity of the incoming order to the book orders at this price level, according to the applicable order allocation method.
3. When all available book orders on the price level have been matched, the price level is exhausted, and the matching engine of T7 continues with the next best available price level.

If at the end, there are no more orders left on the order book against which the incoming order can be executed, and if the incoming order still has a remaining open quantity, then the incoming order is written to the order book, if it was not there already.

The allocation method applied in step 2 matters only if the remaining quantity of the incoming order is less than the accumulated quantity of the book orders at this price level.

Example 7-1:

Assume that during the instrument state Continuous, the buy order book for FESX Jun27 contains four orders, which are listed in the order of their entry time:

- *Order 1: buy 20 contracts at price 3125*
- *Order 2: buy 30 contracts at price 3124*
- *Order 3: buy 10 contracts at price 3125*
- *Order 4: buy 5 contracts at price 3123*

An incoming sell limit order (Order 5, sell 100 contracts at price 3124) is partially executed in two match steps at two trade prices against the buy order book in the following way:

- *First match step at price 3125:*
 - *20 contracts are executed against order 1 at price 3125*
 - *10 contracts are executed against order 3 at price 3125*
- *Second match step at price 3124:*
 - *30 contracts are executed against order 2 at price 3124*

Order 4 is not executed since its limit price 3123 is lower than the limit price 3124 of the incoming sell order. The remaining quantity 40 of the incoming sell order is written to the order book.

If the quantity of the incoming sell order had been 25 instead of 100, then the sell order would have been fully matched in one match step at price 3125 against order 1 and order 3. While the distribution of the total executed quantity of 25 among the equally priced orders 1 and 3 depends on the configured allocation method (see below), order 2 is in any case not executed because of its lower price priority.

The limit price of the book order to be matched becomes the execution price. An incoming order may thus match at various execution prices, depending on the limit prices of the book orders that it is executed against.

7.2.1.2 Match Event

The matching of a single incoming order against possibly many orders on the book at various price levels constitutes a Match Event.

7.2.1.3 Match Step

A match event is subdivided into Match Steps. In direct matching, which is described in this chapter, a match step comprises all matching at a specific price level.

The precise definition of a match step is that it comprises all matching where all the matched book orders are allocated in one distribution step per involved instrument. This, however, gains relevance only in synthetic matching, where several match steps per price level are possible (see chapter *Synthetic Matching in Continuous Trading* in the *T7 Functional Reference Part 2*) and can thus be ignored in this chapter.

7.2.1.4 Match Step Identifier

Each match step has a Match Step Identifier that is unique on a product level for the business day. The match step identifier is included in the publicly distributed trade volume reporting data, and at the same time, the match step identifier is also contained in the order execution messages that are received by the owners of the involved orders. In this way, participants are given the ability to link their own order execution information with the public trade volume reporting data.

7.2.1.5 Immediate Matching in Continuous Auction with Market Maker trading model

In the *Continuous Auction with Market Maker* trading model, immediate matching in instrument state Pre-Call occurs when a crossed order book situation is created by either the Liquidity Provider quote and an order (limit or market) or by two orders (limit or market) within the limits of the LP quote, if the quote does not trigger a stop order, and if no order is partially matched. Otherwise, the instrument state changes to Auction-Call.

In the *Continuous Auction with Specialist* trading model, there is no immediate matching. Here, matching is possible only within the Freeze phase controlled by the Specialist.

7.2.2 Order Book Uncrossing (Auctions)

Order Book Uncrossing is the matching procedure that is exclusively applied in the context of Auctions.

7.2.2.1 Uncrossing Procedure

The uncrossing procedure executes one or more buy orders on the order book against one or more sell orders on the order book at one single execution price, so that:

1. The limit prices of the executed orders are not violated, and
2. Afterwards the order book is uncrossed, i.e., there are no longer two orders left on the order

book that can be executed against each other.

The rules that are applied to determine the execution price for an uncrossing procedure are described in chapter 7.2.2.2.

The uncrossing procedure is normally applied at the end of an auction phase. An auction phase is a phase where the instrument state is an auction state, possibly alternating with an auction freeze state. See chapters 3.2.1 for details on these instrument states.

Under exceptional circumstances, however, an auction can be cancelled without an uncrossing being done.

Furthermore, the uncrossing procedure must be applied whenever an instrument's state is moved to the Continuous instrument state, even without a previous auction phase. For complex instruments, which do not have an auction phase (see chapter *Instrument States of Complex Instruments* in the *T7 Functional Reference Part 2*), this is the standard case.

Since the main application of the uncrossing procedure is the generation of an auction trade at the end of an auction phase, the uncrossing trade is also called an Auction Trade, and the corresponding trade price is also called an Auction Price, even if no auction phase was involved.

An uncrossing trade is performed as one match event with a single match step. It is reported as an auction trade in the public Trade Volume Reporting.

7.2.2.2 Auction Price Determination

All orders that are executed in a specific uncrossing procedure are executed at the same execution price, irrespective of their limit price. This execution price is the auction price of the specific uncrossing procedure.

T7 supports two different ways to determine the auction price. Both ways follow the principle of Maximizing Executions but differ when more than one price is available. In such a case, the derivatives markets calculate the auction price as the midpoint of the potential price interval weighted by the order quantities. Whereas for the cash markets the surplus and the reference price are used for further determination of the auction price.

In the following, both methods to determine the auction price and their underlying matching rules are described.

7.2.2.2.1 Auction Price Determination – Derivatives markets

T7 determines the auction price for the derivatives markets so that the following two main objectives are reached:

1. Uncrossing: After the auction trade, there are no two orders left in the order book that are executable against each other. As a consequence, the best sell price that is available after the execution of the auction trade is always higher than the corresponding best buy price. Market orders are considered as being executable against any limit order.
2. Price Continuity: The auction trade price is not lower than the best buy price that is available after the execution of the auction trade, and it is not higher than the best sell price that is available after the execution of the auction trade.

As a by-product of fulfilling these two objectives, the principle of Maximizing Executions is fulfilled as well, i.e., the auction price is a price for which the executed volume is maximized.

It is possible that prices in a whole price range can reach the above objectives. In this case, T7 applies the following additional rules to decide on a single auction price:

3. If the range of possible prices is limited on both sides by limit prices of orders in the order book, then the following formula is applied to calculate the auction price:

$$AP = \frac{BMQ \times LoP + BLQ \times HiP + SLQ \times LoP + SMQ \times HiP}{BMQ + BLQ + SLQ + SMQ}$$

where

- AP is the auction price,
- BMQ is the accumulated quantity of Buy market orders,
- BLQ is the accumulated quantity of Buy limit orders, which can be executed at a price in the determined range,
- SLQ is the accumulated quantity of Sell limit orders, which can be executed at a price in the determined range,
- SMQ is the accumulated quantity of Sell market orders,
- LoP is the lowest price of the determined range,
- HiP is the highest price of the determined range,

If the resulting price is not a valid price according to the applicable price step table, then the auction price is rounded down to the next valid price.

4. If the range of possible prices is limited only on one side by the limit price of an order in the order book, then this limit price is chosen as the auction price.

Example 7-2:

For FESX Jun27, the order book contains three orders on each side as follows.

- *Buy order book:*
 - *Order 1: buy 5 contracts without price limit (market order)*
 - *Order 2: buy 20 contracts at price 3131*
 - *Order 3: buy 25 contracts at price 3127*
- *Sell order book:*
 - *Order 4: sell 10 contracts without price limit (market order)*
 - *Order 5: sell 15 contracts at price 3128*
 - *Order 6: sell 10 contracts at price 3132*

The main objectives Uncrossing and Price Continuity can be reached with any auction price in the range 3128 to 3131. Below the price 3128, sell order 5 cannot be matched anymore because of its price limit, which reduces the available quantity for the execution to 10. This in turn does not allow buy order 2 to be fully executed. Since the remainder of order 2 and order 5 are crossed, the objective of Uncrossing would not be reached. A similar reasoning applies to prices above 3131.

To select a single auction price in the interval between 3128.0 and 3131.0, the third rule is applied:

$$AP = \frac{5 \times 3128.0 + 20 \times 3131.0 + 15 \times 3128.0 + 10 \times 3131.0}{5 + 20 + 15 + 10} = 3129.8$$

The result is rounded down to 3129.0 as the next lower price consistent with the price step table. The executed quantity is 25.

For the derivatives markets there are situations where no auction price can be determined and therefore no auction trade is done:

- The order book is not crossed; there are no two orders that can be matched against each other.
- There are only market orders on both sides of the order book. In this case, there is no limit price that could serve as a reference for the determination of the auction price. Therefore, no auction trade is done, and the uncrossing condition mentioned above is considered fulfilled anyway.

7.2.2.2.2 Auction Price Determination – Cash Markets

The auction price for cash markets is determined according to the *Principle of Most Executable Volume* and lowest surplus.

Should this process determine more than one limit with the highest executable order volume and the lowest surplus, then the surplus is referred to for further price determination:

1. The auction price is stipulated according to the highest limit if the surplus for all limits is on the buy side (bid surplus).
2. The auction price is stipulated according to the lowest limit if the surplus for all limits is on the sell side (ask surplus).

If the inclusion of the surplus does not lead to a clear auction price, the reference price (the last trade price) is included as additional criterion. This may be the case:

- If there is a bid surplus for one part of the limits and an ask surplus for another part.
- If there is no surplus for all limits.

In both cases, the reference price is considered for stipulating the auction price:

3. If the reference price is higher than or equal to the highest limit, the auction price is determined according to this limit.
4. If the reference price is lower than or equal to the lowest limit, the auction price is determined according to this limit.
5. If the reference price lies between the highest and lowest limit, the auction price equals the reference price.

If only market orders are executable against one another, they are matched at the reference price.

Example 7-5:

For an equity the order book contains two orders on each side as follows.

- *Buy order book:*
 - *Order 1: buy 300 at price 202*
 - *Order 2: buy 200 at price 201*
- *Sell order book:*
 - *Order 3: sell 300 at price 199*
 - *Order 4: sell 200 at price 198*

There are several possible limits (199 and 201) and no surplus on hand. The auction price either equals the reference price or is fixed according to the limit nearest to the reference price:

- *If the reference price is € 201, the auction price is € 201*
- *If the reference price is € 202, the auction price is € 201*
- *If the reference price is € 198, the auction price is € 199.*

An auction price cannot be determined if orders are not executable against one another (exception see section 7.2.2.3).

7.2.2.2.3 Auction Price Determination – Cash Markets Retail Early And Late Trading

The price determination in the product states Retail Early and Late Trading takes place in the Retail Call auctions. Only Retail orders entered by Retail Member Organizations (RMO) or Retail quotes and orders entered by Retail Liquidity Providers (RLP) – not restricted to Main Trading Hours (MTH) – take part in the price determination. As in Main Trading, Retail orders can match with each other, but RLP quotes/orders cannot. Crossed RLP quote/order scenarios are resolved via an orderbook consistency adjustment mechanism (details below).

The auction price is the price with the highest executable order volume and the lowest surplus at or within the RLP (consistency-adjusted – when applied) quote/order limits or boundaries⁷. A strict price-RLP-time matching priority will be followed during the allocation of executed quantities. In case of multiple RLP quotes/orders, consistency-adjusted to the same limit, the RLP quote/order with the higher actual/physical limit will have the priority.

The following rules apply when the orderbook has multiple RLP quotes/orders available on both sides or only on the one side.

- Matching outside the RLP quotes or RLP orders limit is not possible.
- If more than one RLP quote/order are available, the lowest of limits on the bid or ask side and the highest of limits on the ask or bid side define the RLP outer boundaries. This also covers scenarios where RLP orders/quotes are available only on one side of the order book.
- The modified principle of highest executable volume with lowest surplus at or within the RLP outer boundaries or limits is used for the price determination.

⁷ Limits mainly refer to RLP quotes/orders available only on one side. Boundaries refer to RLP quotes/orders available on both sides.

- Any crossed RLP quotes/orders situation will be resolved via consistency adjustment, details below.
- RLP quotes/orders will never get matched on both sides of the orderbook in one price determination.
- Without a RLP quote/order, no price determination takes place.

Handling of Crossed RLP quotes/orders – Consistency Adjust-to-Reference Rule:

In case of an incoming RLP quote/order or modification/deletion of a RLP quote/order that would lead to a crossed RLP quote/order or zero-spread RLP quote/order situation, adjusting in the direction of the reference price with an offset to tick is applied. The rules are the following:

- If the reference price is above the bid limit of the crossing quote, then the ask quote will be adjusted to a limit one tick above the bid limit of the crossing quote.
- If the reference price is below the ask limit of the crossing quote, then the bid quote will be adjusted to a limit one tick below the ask limit of the crossing quote.
- If the reference price lies at or between the crossing quote limits, then both crossing limits will be adjusted, where
 - the bid limit is adjusted to 1 tick below the reference price, and
 - the ask limit is adjusted to 1 tick above the reference price.
- RLP orders/quotes take part in the auction price determination with their adjusted limits.
- If several RLP limits are adjusted to the same limit on one side of the orderbook, then the RLP orders/quotes take part in the allocation of executed quantities with their physical/actual limit.
- Based on the orderbook situation and physical limits of crossing quotes, the situation is adjusted or un-adjusted after each orderbook event, if necessary.

The match event will be flagged as Retail match event for any execution in Retail Early and Late Trading phases.

7.2.2.3 Auction Price without Turnover (APWT) – Cash Markets

In general, an auction price cannot be determined if orders are not executable against one another. However, for the cash markets a concept of auction prices without turnover is available on T7. The use of the *Auction Price without Turnover* functionality is determined by the exchange on instrument level.

Please do not confuse Auction Price Without Turnover (APWT), used in *Continuous Trading* trading models, with Price Without Turnover Quote (PWT), used in *Continuous Auction* trading models.

Set Up Information:

Currently, the functionality is activated for all ETFs, ETCs and ETNs as well as for all equities traded on Xetra. For WBAG the APWT functionality is used for selected ETFs. APWT prices are used as reference prices on Xetra and WBAG.

An auction price without turnover is potentially offered in all regular auctions such as opening, intraday, or closing auction, but not in volatility auction. It is determined as the midpoint of the existing best bid and best ask limits in the order book at the end of the auction's call phase. Auction prices without turnover are disseminated with a quantity of zero via T7 market data feed.

An auction price without turnover is only determined by the T7 system if the following conditions are met:

- A regular auction price cannot be determined at the end of the auction's call phase.
- At least one bid and one ask limit is present at the end of the auction's call phase.
- The auction price without turnover lies both within the instrument's volatility prices ranges (such as Floating Price Range and Fixed Price Range, or ACE corridor) at the end of the auction's call phase, or the auction price without turnover lies outside of the instrument's volatility price ranges, but at least one (and the same) Designated Sponsor provides liquidity at the same time on *both* sides of the order book (either as order(s) or (Designated Sponsor) quote side(s)) in compliance with the respective minimum requirements of the instrument at the end of the auction's call phase.

If one or several of the conditions listed above are not fulfilled, an auction price without turnover cannot be determined.

7.2.3 Quote-driven Order Book Uncrossing for Cash Markets

The matching in the *Continuous Auction* trading models is similar to an order book uncrossing, yet there are the following differences:

- Matching is restricted to the limits set by a matching quote. Only orders and quotes are taken into account, which have a limit within the matching quote's limits or better or are market orders. All other orders and quotes are not taken into account.
- The criterion for price determination in case of an ambiguous result based on executable volume and minimum surplus is different. Not the reference price is used, but the midpoint of the highest bid limit with minimum surplus and the lowest ask limit with minimum surplus (both obviously within the matching range) is taken. This midpoint is then rounded to the next allowed price step and determines the auction price.

Any possible matching within the price range of the Matching Quote (including its borders) is performed, either of orders among themselves, or of orders with the Matching Quote. Stop orders (including OCO and TSO orders) triggered by the Matching Quote are considered, too. As matching procedure, the *Modified Principle of Most Executable Volume* is applied.

7.2.3.1 Continuous Auction with Market Maker

The trading in the *Continuous Auction with Market Maker* trading model (CA-M) is used for cash market instruments. It is driven by quotes entered by a *Liquidity Provider* (LP) acting as a market maker on behalf of the issuer. Each instrument traded in this model has exactly one Liquidity Provider assigned.

Matches can happen either in the instrument state Pre-Call or in Auction-Call, but only within the limits of the Liquidity Provider quote (LP quote). Thus, the quotes define a price corridor outside of which no match can take place. The rules of matching in Pre-Call follow the continuous matching rules, the rules of matching in Auction-Call follow the Auction Uncrossing rules. In Auction-Call a Standard quote or a Matching quote is required to constitute a match.

Orders can be limit or market orders, stop and trailing stop orders, or OCO orders, but no order restrictions are allowed. Quotes can be Standard quotes, Indicative quotes, Price-without-turnover

quotes (PWT), or Matching quotes. Standard quotes and Indicative quotes can be entered only in Book or Pre-Call. PWT quotes can be entered in Pre-Call only and have quantities of zero. A matching quote entered in instrument state Book or Pre-Call is treated like a Standard quote. A matching quote entered in Auction-Call triggers an immediate matching. Indicative quotes behave like Standard quotes except that they never take part themselves in matching. They are not valid in Auction-Call.

Example 1:

- *Instrument is in Pre-Call.*
 - *Order entered: Sell 10@5.*
 - *Order entered: Buy 10@22.*
 - *No match since no quote.*
 - *Standard Quote or Indicative Quote entered: 0@10 vs 0@20.*
 - *Immediate match without Auction 10@15,*
since 15 is the midpoint of 10 and 20 from the quote, and no surplus.

Example 2:

- *Instrument is in Pre-Call.*
 - *Order entered: Sell 10@5.*
 - *Order entered: Buy 10@22.*
 - *No match since no quote.*
 - *Standard Quote 0@10 vs 100@20, or resp. Indicative Quote entered*
 - *Immediate match without Auction 10@10,*
since ask surplus on ask side shifts auction price toward the opposite side.

Set Up Information:

The trading model Continuous Auction with Market Maker is available for WBAG and its partner exchanges as "Emittentenmodell".

7.2.3.2 Continuous Auction with Specialist trading model

The trading in the *Continuous Auction with Specialist* trading model (CA-S) is used for cash market instruments. It is driven by quotes entered by a Specialist with Trading Capacity *Issuer/Liquidity Provider* acting on behalf of the issuer. Each instrument traded in this model has exactly one Specialist assigned.

Matches can happen exclusively in the instrument state *Freeze* and only within the limits of the Specialist's matching quote. The rules of matching follow the Auction Uncrossing rules.

The following order types are allowed: Limit order, Market order, Stop order (limit or market), TSO order, OCO order, Special-Auction-Only order.

Example 1:

- *Instrument is in Pre-Call.*
 - *Order entered: Sell 10@5.*
 - *Order entered: Buy 10@22.*
 - *No match since no quote.*
- *Specialist changes instrument state to Freeze.*
 - *Matching Quote entered: 0@10 vs 0@20.*
 - *Match 10@15,*
since 15 is the midpoint of 10 and 20 from the quote, and no surplus.

Example 2:

- *Instrument is in Pre-Call.*
 - *Order entered: Sell 10@5.*
 - *Order entered: Buy 10@22.*
 - *No match since no quote.*
- *Specialist changes instrument state to Freeze.*
 - *Matching Quote entered: 0@10 vs 100@20.*
 - *Match 10@10,*
since ask surplus on ask side shifts auction price toward the opposite side.

Set Up Information:

The trading model Continuous Auction with Specialist is available for all cash markets and set up for Deutsche Börse Frankfurt.

7.3 Market Order Matching in Continuous Trading

Market orders are entered by traders to be matched at any price as long as it is the best available price. When not matched they may be saved on the book like limit orders.

T7 supports two different types of Market Order Matching namely

- Market Order Matching *with* Market Order Matching Range.
- Market Order Matching *without* Market Order Matching Range.

The Market Order Matching Range is a protection of market orders against unreasonable execution prices. The use of the Market Order Matching Range is determined by the exchange.

The exact rules for market order matching with and without Market Order Matching Range are described in the following chapters.

Set Up Information:

Xetra, Frankfurt, BSE, MSE, and WBAG with its partner exchanges do not support the Market Order Matching Range for any instrument.

All market orders in instruments of the exchanges Eurex and EEX are protected by the Market Order Matching Range.

7.3.1 Market Order Matching without Market Order Matching Range

If the Market Order Matching Range is disabled, market orders are treated as having no price limit, i.e., their volume is available at any price in the execution price determination protected by the volatility range limits.

An incoming market order always crosses the book if there is an active order on the opposite side. The best available limit of the opposite order book side defines the execution price for an incoming market order.

In case there are resting market orders in front of the best available limit, the last traded price constitutes the execution price if it is better than the best available book limit or no book limit is available.

Since an incoming market order is always executed as long as there is quantity on the opposite side of the book, a crossed book situation is prevented.

For an incoming limit order, the pricing of booked market order also depends on the incoming limit.

The execution price for a booked buy market order is set as follows:

$$\text{Execution price} = \max\{\text{Last Trade Price}, \text{Best Bid Limit}, \text{Best Ask Limit}\}$$

The execution price for a booked sell market order is set as follows:

$$\text{Execution price} = \min\{\text{Last Trade Price}, \text{Best Bid Limit}, \text{Best Ask Limit}\}$$

7.3.2 Market Order Matching with Market Order Matching Range

The Market Order Matching Range helps to protect market orders against unfair trades. It is applied by defining a price interval around the current market price, outside which a market order is not allowed to match.

Therefore, it is possible that in a continuous trading phase market orders are saved on the book, even if the opposite side of the order book is not empty.

The Market Order Matching Range is identical to the Price Range that is defined in chapter 6.1.2. This includes that its value depends on a reference price, and that the value may depend on whether there is a Fast Market or Stressed Market Condition. Chapter 6.1.2 applies without changes to the calculation of the Market Order Matching Range.

7.3.2.1 Matching of Incoming Market Orders

An incoming market buy order can match against orders on the sell order book, if the execution price is not greater than the best buy price plus the Market Order Matching Range, where the Market Order Matching Range is calculated with the best buy price as the reference price.

If there is no best buy price available, then the instrument's minimum price is used instead. This is relevant mainly for out-of-the-money options series.

An incoming market sell order can match against orders on the buy order book, if the execution price is not smaller than the best sell price minus the Market Order Matching Range, where the Market Order Matching Range is calculated with the best sell price as the reference price.

Continuing the use of the definition given in chapter 7.1.4, the term *incoming* includes

- Orders that are modified from being limit orders to being market orders,
- Triggered stop market orders and triggered OCO orders.

In the case that the instrument supports synthetic matching, the best price that is applied here is the published best price. See the chapters on synthetic pricing in the *T7 Functional Reference Part 2* for details on synthetic matching and published best prices.

If the order book situation is such that an incoming market order cannot or can no longer match at a price inside the Market Order Matching Range, then depending on whether it is an IOC order or not, the remaining part of the incoming market order is either cancelled or it is saved on the book, even if there are still orders on the opposite side of the order book.

Example 7-3:

For FESX Jun27, the market order matching range is 10, independent of the price to which it refers.

The sell order book contains the following orders:

- *Order 1: sell 20 contracts at price 3125*
- *Order 2: sell 10 contracts at price 3130*
- *Order 3: sell 30 contracts at price 3132*

The buy order book contains the following orders:

- *Order 4: buy 15 contracts at price 3120*
- *Order 5: buy 30 contracts at price 3118*

A buy market order is entered:

- *Order 6: buy 60 contracts without price limit (market order)*

The best available buy price is 3120. The incoming buy market order can therefore match until a price of 3130, which is determined as the best buy price plus the market order matching range, i.e., $3120 + \text{Range} (3120) = 3130$.

The incoming buy market order is thus executed against order 1 at price 3125 and against order 2 at price 3130. However, it is not executed against order 3 because of the market order matching range. The order is instead written to the order book with a remaining quantity of 30.

7.3.2.2 Matching of Book Market Orders

If there are one or more book market orders resting on the side of the order book that is opposite to the side of the incoming order, then these book market orders are executed at a trade price that is equal to the best available limit price on the side of the resting market orders.

This means that the execution price, at which a book market order that faces an incoming order is allowed to match, is not extended by the Market Order Matching Range.

In case that synthetic matching is supported, this best available limit price can be a synthetic price, which may differ from the best limit price taken from orders in the same instrument and even from the

published best price. See the chapters on synthetic pricing in the *T7 Functional Reference Part 2* for details on synthetic pricing.

If there is no such best limit price available, resting buy market orders can still be matched at the instrument's minimum price, which is relevant mainly for out-of-the-money options series.

When book market orders are matched at the same price as the best priced book limit orders, the book market orders are matched together with the best priced book limit orders in one single match step. However, in the order allocation, these market orders and limit orders are allocated separately, and the market orders are allocated first.

Example continued (1):

The buy order book for FESX Jun27 contains now the following orders:

- *Order 6: buy 30 contracts without price limit (market order)*
- *Order 4: buy 15 contracts at price 3120*
- *Order 5: buy 30 contracts at price 3118*

And the sell order book contains the following order:

- *Order 3: sell 30 contracts at price 3132*

A limit order to sell 10 contracts at price 3115 is entered. It is fully executed against book market order 6 at the best available buy price of 3120, which is the limit price of order 4.

7.3.2.3 Book Market Order Triggering by Incoming Orders

An incoming limit order or market order on the same side as a book market order cannot be matched before that book market order.

The term incoming order also applies here to the following:

- Orders that are being modified such that the limit price is improved.
- Quotes that are reactivated.
- Stop orders, TSO and OCO orders that are triggered (see chapters 4.3, 4.4 and 4.6).
- Futures spread orders that are fed into the market after an uncrossing (see chapter *Feeding of Futures Spread Orders* in the *T7 Functional Reference Part 2*).

Thus, in case that an incoming order could be executed, but that there are one or several market orders in the book on the same side as the executable incoming order, then all these book market orders are triggered one after the other, before the incoming order is processed.

The condition for the triggering to occur is strictly that the incoming order would match, at least if the book market order triggering would not be done first. The mere fact that there is an incoming order or that this order has a better limit price than the currently available best buy price is not sufficient for triggering book market orders.

Market order triggering means that based on the time priority, the book market orders are re-processed one after the other as incoming orders. Compared to the handling of real incoming market orders, the Market Order Matching Range is applied for triggered market orders in a different way as

follows, but only if the incoming order is a limit order:

- If the incoming order is a buy limit order, then the execution price of a triggered buy market order cannot be both higher than the incoming order's limit price, and higher than the best available sell price plus the Market Order Matching Range, where the Market Order Matching Range is calculated with the best available sell price as the reference price.
- If the incoming order is a sell limit order, then the execution price of a triggered sell market order cannot be both lower than the incoming order's limit price, and lower than the best available buy price minus the Market Order Matching Range, where the Market Order Matching Range is calculated with the best available buy price as the reference price.

In case that synthetic matching is supported, the best available price can be a synthetic price, which may differ from the best limit price taken from orders in the same instrument and even from the published best price. See the chapters on synthetic pricing in the *T7 Functional Reference Part 2* for details on synthetic pricing.

Note that contrary to the case of real incoming market orders, the Market Order Matching Range is here applied to the opposing order book side.

Example continued (2):

The buy order book for FESX Jun27 contains now the following orders:

- *Order 6: buy 20 contracts without price limit (market order)*
- *Order 4: buy 15 contracts at price 3120*
- *Order 5: buy 30 contracts at price 3118*

And the sell order book contains:

- *Order 3: sell 30 contracts at price 3132*

Another buy market order is entered:

- *Order 8: buy 10 contracts without price limit (market order)*

The best available buy price is 3120 and the best available sell price is 3132. Their price difference is greater than the market order matching range of 10, and therefore the incoming market order cannot be matched. It is instead written to the order book.

Then a buy limit order is entered:

- *Order 9: buy 20 contracts at price 3130*

This incoming limit order is itself not executable and is therefore written to the order book without execution. Since it is not executable itself, the incoming limit order also does not trigger the book market orders. Therefore, even though the spread between the new best available buy price of 3130 and the best available sell price at 3132 is now smaller than the market order matching range of 10, the book market orders are not triggered and remain on the order book.

Finally, another buy limit order is entered:

- *Order 10, buy 10 contracts at price 3135*

This incoming buy limit order is executable and therefore triggers the book market orders 6 and 8. Their execution limit is now $\text{Max}(3135, 3132 + \text{Range}(3132)) = 3142$.

The triggered book market orders 6 and 8 are thus executed against order 3 at the latter order's limit price of 3132. All three orders get fully executed, leaving the sell order book empty, and so the incoming limit order 10 is written to the order book.

In the case that the incoming order is a market order, the Market Order Matching Range is applied for the execution of the triggered book market order in the same way as for real incoming market orders, i.e.

- If the incoming order is a buy market order, then a triggered buy market order can match if the execution price is not greater than the published best buy price plus the Market Order Matching Range, where the Market Order Matching Range is calculated with the published best buy price as the reference price. If there is no published best buy price available, it is substituted by the instrument's minimum price.
- If the incoming order is a sell market order, then a triggered sell market order can match, if the execution price is not smaller than the published best sell price minus the Market Order Matching Range, where the Market Order Matching Range is calculated with the published best sell price as the reference price.

In the case that the instrument supports synthetic matching, the published best price may be a synthetic price. See the chapters on synthetic pricing in the *T7 Functional Reference Part 2* for details on synthetic matching and published best prices.

In the end, if all book market orders to be triggered have been processed, T7 processes the incoming order. Any stop orders that are triggered by the execution of the triggered book market orders are processed only after the incoming order has been processed.

BOC orders (see chapter 4.7) never match on entry and therefore do not trigger book market orders.

7.3.2.4 Book Market Order triggered by Incoming Quotes

Incoming executable quotes trigger book market orders in the same way as incoming orders, see chapter 7.3.2.3. Additionally, quotes that are not executable on entry may trigger book market orders as well, if the conditions outlined in the following are fulfilled. The triggering of the book market orders takes place immediately after the incoming quote has been written to the order book. Where trades occur infrequently, this rule helps matching book market orders in quote driven markets.

The condition to be applied is that the spread of the incoming quote is smaller than or equal to the Price Range as defined in chapter 6.1.2. This condition depends on whether a market order is a buy order or a sell order, i.e., in the case of an incoming double-sided quote,

- buy market orders are triggered, if

$$\text{Sell Quote Price} - \text{Buy Quote Price} \leq \text{Price Range (Buy Quote Price)},$$
- and sell market orders are triggered if

$$\text{Sell Quote Price} - \text{Buy Quote Price} \leq \text{Price Range (Sell Quote Price)},$$

The condition is also considered to be fulfilled in the following cases:

- The same conditions are applied when quotes are reactivated rather than real incoming.
- The same conditions are applied when a single-sided quote is incoming, and the other side of the quote is already on the order book.

Additionally, in the case of a single-sided sell quote, the same condition is applied, but by calculating the spread using the instrument's minimum limit price instead of the missing buy quote price, i.e.

- buy market orders are triggered, if

$$\text{Sell Quote Price} - \text{Minimum Price} \leq \text{Price Range (Minimum Price)},$$
- and sell market orders are triggered if

$$\text{Sell Quote Price} - \text{Minimum Price} \leq \text{Price Range (Sell Quote Price)},$$

The triggering of the book market orders occurs immediately after the quote has been written to the order book. This means that the triggered market orders might match against the quote that triggered it at the limit price of the quote.

If there are market orders eligible to be triggered on both sides of the order book, then only the market orders are triggered on the side of the order book, where the accumulated quantity of market orders is higher. If the quantities on both sides are equal, only the buy market orders are triggered. This then automatically results in the book market orders on the other side of the order book being fully matched by the triggered market orders.

The price limit for the execution of market orders that are triggered due to the conditions of this chapter is identical to the limit that is applied to incoming market orders. The rules are described in chapter 7.3.2.1.

Example 7-4:

Starting with an empty order book, the following orders are entered for FESX Jun27:

- *Order 1: buy 20 contracts at price 3150*
- *Order 2: sell 10 contracts at price 3165*

Then the following market orders are entered:

- *Order 3: buy 20 contracts without price limit (market order)*
- *Order 4: sell 20 contracts without price limit (market order)*
- *Order 5: sell 10 contracts without price limit (market order)*

The difference between the best buy price 3150 and the best sell price 3165 is greater than the market order matching range, which is always 10, no matter for which price it is calculated. Therefore, all these market orders cannot be matched and are written to the order book.

Now a double-sided quote is entered:

- *Buy 10 contracts at price 3145 and sell 10 contracts at price 3155*

Both sides of the quote are not executable, and so both sides of the quote are written to the order book without execution.

However, the difference between the sell quote price and the buy quote price is equal to the price range for both sides. Therefore, the entry of the double-sided quote triggers the market orders on both sides of the order book.

Since the accumulated quantity of sell market orders ($20 + 10 = 30$) is greater than the accumulated quantity of buy market orders (20), it is the sell market orders that are triggered.

- The oldest sell market order 4 is triggered first. Its quantity of 20 is fully executed at price 3150 against the buy market order 3, which in this way gets fully executed as well.*
- The next sell market order 5 is triggered afterwards. Its quantity of 10 is fully executed at price 3150 against the buy limit order 1, which has a better limit price than the buy quote.*

While all market orders are fully executed, the double-sided quote is not executed at all even though it triggered the execution of the book market orders.

7.4 Xetra Midpoint Matching

Xetra Midpoint matching (cf. chapter 8.3) is not a price determination procedure since the Midpoint price is given by the BBO constellation in the Xetra CLOB. Xetra Midpoint matching follows a volume-time priority, prioritizing the size and the entry time of Midpoint orders. The Xetra Midpoint matching procedure maximizes the overall executable volume at the prevailing Midpoint price, taking into consideration MAQ and CRT order restrictions.

The Midpoint opportunity detection for potential matches is started once the Midpoint price moves, once the instrument moves to *Continuous*, or once a Midpoint order is entered or modified (not: deleted). Sitting Midpoint orders becoming CRT-eligible (i.e., the moment when they have achieved the Minimum Marketable Resting Time) do not trigger a Midpoint opportunity detection. However, Midpoint CRT orders are matched with priority against CRT-eligible Midpoint orders with the next Midpoint opportunity detection. Midpoint MBO orders do not participate in the Midpoint opportunity detection that is triggered by their own order entry or modification.

The price limit of Midpoint and Midpoint Sweep orders entered as Limit orders (L) will not be considered for any price determination in Midpoint matching since the Midpoint price for any potential match in the Midpoint order book will be determined by the BBO constellation in the Xetra CLOB. In the Midpoint order book, the limit will only serve as cap or floor, limiting the price at which a buy or sell Midpoint or Midpoint Sweep order may be executed.

Any Midpoint price which, after rounding to the T7 tick size, will be equal to the best bid or to the best offer of the BBO spread in the Xetra CLOB will not be considered a valid Midpoint price and no Midpoint execution will take place based on this price. Any Midpoint price outside the current volatility corridor will not result in a Midpoint match.

7.5 Order Allocation Methods

7.5.1 Overview

An Order Allocation Method describes how a tradable quantity is shared among a group of eligible orders, if the tradable quantity is insufficient to allow all eligible orders to be fully executed.

T7 always observes a strict price priority. This means that an eligible limit order receives a share only, if all market orders and all limit orders with a better limit price are fully matched. Therefore, the different order allocation methods describe different ways on how to distribute a tradable quantity to be shared among orders of the same price level, if that tradable quantity is lower than the accumulated quantity of the orders at that price level.

T7 supports three order allocation methods, which are explained in detail in the following subsections:

1. Pro-Rata Allocation: This allocation is based on the quantity ratio defined by the individual book order quantity divided by the total accumulated quantity of all price best book orders. The matched quantity of a book order is given by the multiplication of its quantity ratio and the quantity of the incoming order. In this way, all price best book orders are considered for execution. The Pro-Rata Allocation method is described in chapter 7.5.2.
2. Time-Pro-Rata Allocation: The price best orders are sequenced by their time priority. Orders with a higher time priority receive a higher matched quantity compared to the Pro-Rata Allocation at the expense of orders with a lower time priority. Compared to the Time Allocation, orders with a high time priority receive a lower matched quantity. Depending on the specific order book situation, it may be possible that not all price best orders are considered for execution and, consequently, the number of orders considered by the Time-Pro-Rata Allocation is smaller compared to the Pro-Rata Allocation. The Time-Pro-Rata Allocation method is described in chapter 7.5.3.
3. Time Allocation: The price best orders are sorted by their time priority. The first price best order is filled as much as possible, and the remaining quantity of the incoming order is passed to the next price best order. Usually, the number of orders that receive a share in the case of the Time Allocation is smaller compared to the case of the Time-Pro-Rata Allocation or of the Pro-Rata Allocation. The Time Allocation method is described in chapter 7.5.4.

The enumeration of the different order allocation methods indicates an increase of the time sensitivity, which is defined by the impact of the orders' time priority on the order allocation. While the Pro-Rata Allocation does not show any time sensitivity, the Time-Pro-Rata allocation may be characterized by a medium-scale time sensitivity. Whereas the Time Allocation obviously has the strongest possible time sensitivity.

T7 allows the exchange to define by product and by instrument type, which order allocation method is applied in continuous trading and which is applied for auction trades.

Another type of allocation is path allocation in synthetic matching, which is not to be confused with order allocation. Path allocation is described as part of the synthetic matching procedure for futures spread instruments in chapter *Synthetic Matching in Continuous Trading: Path Allocation* in the *T7 Functional Reference Part 2*.

Another type of allocation is applied in Midpoint matching in the separate Midpoint order book (see Xetra Midpoint in chapter 8.3): Here, the Midpoint orders are allocated according to a volume-time priority.

7.5.2 Pro-Rata Allocation

The pro-rata allocation method first sorts the eligible orders by their open quantity, orders with larger open quantity coming first. If there are orders with the same open quantity, these are then sorted between them by their time priority, orders with an older time priority stamp preceding those with a newer priority time stamp.

It then calculates the allocated share for one eligible order after the other in the sequence that they have just been sorted, with the following procedure:

1. Divide the quantity of the order by the sum of the quantities of all eligible orders that are still left to receive an allocation.
2. Multiply the result by the remaining tradable quantity to be allocated among the eligible orders.
3. If the result is not an integer number, then round the result up to the next highest integer number. The result is the allocation for the concerned order.

This calculation of the allocated share can also be expressed with the help of a mathematical formula:

$$a_i = \text{MIN} \left[q_i, \text{ROUNDUP} \left[A_i \times \frac{q_i}{Q_i} \right] \right]$$

where a_i	is the quantity that is allocated to the order at position i in the sorted list of eligible orders,
MIN	is the minimum function, i.e., $\text{MIN}[X, Y]$ is either X or Y , whichever is smaller,
q_i	is the open quantity of the order at position i in the sorted list of eligible orders,
ROUNDUP	means that the computed value is rounded up to the next higher integer number,
$A_i = \left(A - \sum_{k=1}^{i-1} a_k \right)$	is the quantity available to be allocated to the order at position i in the sorted list of eligible orders, which is given by the total quantity A to be allocated minus the sum of the quantities a_k that were already allocated to the orders, which are placed higher in the sorted list of eligible orders.
$Q_i = \sum_{k=i}^n q_k$	is the accumulated open quantity of all eligible orders that have not yet been allocated their share.

Note that the rounding effects may result in a slight preference of larger orders, and in case of equal open order quantities in a slight preference of older orders.

Example 7-7:

A quantity of 25 is to be allocated among three orders in the order book with a total open quantity of 90. Their time priority is given by the sequence in the following list, highest time priority first:

- Order 1: Quantity 20
- Order 2: Quantity 20
- Order 3: Quantity 50

For the Pro-Rata Allocation, these orders are sorted by quantity first. The two orders with the same quantity are then sorted by time priority. The allocation quantities are iteratively calculated.

Order Priority	Order Quantity	Allocation calculation	Result before rounding	Final allocation after rounding
Order 3	50	$25 * 50 / 90$	13.89...	14
Order 1	20	$(25 - 14) * 20 / 40$	5.5	6
Order 2	20	$(25 - 14 - 6) * 20 / 20$	5	5

The highest allocation goes to the largest order. The allocation for the two equal sized orders is nearly the same, but the rounding gives a slight precedence to the order with the higher time priority.

7.5.3 Time-Pro-Rata Allocation

7.5.3.1 Time-Pro-Rata Allocation Procedure

The procedure for the time-pro-rata allocation comprises of two allocations, which are executed in two consecutive steps, first a basic allocation step and then a remainder allocation step. With the basic allocation, the quantity is distributed close to an Ideal Time-Pro-Rata Allocation formula. The basic allocation allocates only the integer parts of the Ideal Allocation Quantities leaving the accumulated fractional shares for allocation in the remainder allocation.

In detail, the procedure works as follows:

1. Basic Allocation Step:
 - i. Calculate the Ideal Allocation Quantity for each order according to the Ideal Time-Pro-Rata Allocation that is described further below.
 - ii. The ideal allocation quantity is a number, which is not subject to any integer requirements. Therefore, round down the ideal allocation quantities to the next integer value. The rounded value is allowed to be zero. This gives the allocation quantities of the basic allocation for each order.
 - iii. If, by chance, all of the ideal allocation quantities have been integer numbers already, the allocation quantities of the basic allocation constitute already the final order match quantities and the procedure is finished. Or there is a remaining quantity that needs to be allocated in the remainder allocation step as follows.

2. Remainder Allocation Step:

- i. The remaining quantity that is to be allocated is obtained by subtracting the quantities that have been allocated in the basic allocation step from the total quantity to be allocated.
- ii. The remaining quantity is then distributed according to the Remainder Allocation Procedure, which is described further below. For this allocation, only orders are considered which have a non-zero open quantity remaining after the basic allocation. This gives the allocation quantities of the remainder allocation for each order. Due to the design of the allocation procedure, each book order receives, at most, one additional unit of quantity in the remainder allocation.
- iii. The allocation quantities of the basic allocation and the remainder allocation are added up to give the final order match quantities.

The following two sub-chapters describe in detail the two allocation methods that are part of the time-pro-rata allocation procedure as described above.

7.5.3.2 Ideal Time-Pro-Rata Allocation

This sub-chapter describes the determination of the ideal allocation quantities, which constitutes the sub-step i of the basic allocation step as described above.

The ideal time-pro-rata allocation calculates the ideal allocation quantities in an iterative procedure. To this end, the orders are sorted in descending time priority, i.e., older orders that have the higher time priority come first.

The procedure then iterates over the eligible orders one after the other to determine the ideal allocation quantity for each order applying the following formula:

$$\tilde{a}_i = \text{MIN} \left[q_i, \left(\tilde{A}_i \times \left(1 - \left(1 - \frac{q_i}{Q_i} \right)^2 \right) \right) \right] = \text{MIN} \left[q_i, \left(\tilde{A}_i \times \left(\frac{Q_i^2 - Q_{i+1}^2}{Q_i^2} \right) \right) \right]$$

where $\tilde{a}_i$	is the ideal allocation quantity for the order at position i in the sorted list of eligible orders,
MIN	is the minimum function, i.e., $\text{MIN}[X, Y]$ is either X or Y , whichever is smaller,
q_i	is the open quantity of the order at position i in the sorted list of eligible orders,
$\tilde{A}_i = \left(A - \sum_{k=1}^{i-1} \tilde{a}_k \right)$	is the total quantity A available to be allocated minus the sum of the ideal allocation quantities $\tilde{a}_k$ of the orders, which are placed higher in the sorted list of eligible orders.

$$Q_i = \sum_{k=i}^n q_k$$
 is the accumulated open quantity of those eligible orders, for which the ideal allocation quantity still needs to be calculated.
 (Note that by definition $Q_{i+1} = Q_i - q_i$ and $Q_{n+1} = 0$)

Note that the values of the ideal allocation quantities are in general not integer numbers. The calculation of the above formula and thus the result of the time-pro-rata allocation procedure itself may therefore be influenced by the arithmetic precision that is applied.

With the help of the equation $\tilde{A}_i/A = (Q_i/Q)^2$, with $Q = Q_1$ being the total available quantity of all eligible orders, the above formula can also be expressed as

$$\tilde{a}_i = \text{MIN} \left[q_i, \left(A \times \left(\frac{Q_i^2 - Q_{i+1}^2}{Q^2} \right) \right) \right]$$

Here, the expression $(Q_i^2 - Q_{i+1}^2)/Q^2$ represents the weight of the book order with the rank i .

7.5.3.3 Remainder Allocation Procedure

This sub-chapter describes the remainder allocation procedure, which is applied in the sub-step ii of the remainder allocation step as described above. The remainder allocation procedure distributes the quantity that remains to be allocated after the basic allocation step.

Only orders that have not been already fully allocated in the basic allocation step are considered in the remainder allocation procedure. First, the remainder allocation procedure sorts these orders by quantity, and then by priority time. This means, larger orders come in any case before smaller orders, and only if orders have the same quantity, then the order with the older priority time stamp comes first. The quantity considered in this sorting procedure is the open quantity of the order available for the entire time-pro-rata allocation, and not only what is left after the basic allocation step.

The remainder allocation procedure then distributes the remaining quantity by going through this list from the beginning to the end, and allocating a quantity of 1 to each order, until the remaining quantity is exhausted. That means if there are N Orders in the list and the remaining quantity to be distributed is K , then the first K Orders receive an allocation of 1, while the last $N - K$ orders receive nothing in the remainder allocation procedure.

Example 7-8:

A quantity of 25 is to be allocated among three orders in the order book with a total open quantity of 90. Their time priority is given by the sequence in the following list, highest time priority first:

- Order 1, Quantity 20
- Order 2, Quantity 20
- Order 3, Quantity 50

In the Basic Allocation Step, the orders are sorted by time priority. The ideal allocation quantities are calculated in full precision for all orders. Finally, the ideal allocation quantities are rounded down to get final allocation quantities of the Basic Allocation Step.

Order Priority	Order Quantity	Ideal Allocation Quantity	Rounded Allocated Quantity
Order 1	20	9.87...	9
Order 2	20	7.40...	7
Order 3	50	7.71...	7
Sum	90	25	23

The difference between the total quantity to be allocated, and the sum of the rounded allocation quantities of the Basic Allocation Step turns out to be $25 - 23 = 2$. This is the remaining quantity that is distributed in the Remainder Allocation Step.

In the Remainder Allocation Step, the orders are sorted by quantity first. The two orders with the same quantity are then sorted by time priority. The remainder quantity of 2 is now allocated one by one to the orders sorted in this way.

Order Priority	Order Quantity	Basic Allocations	Remainder Allocated	Total Allocated
Order 3	50	7	1	8
Order 1	20	9	1	10
Order 2	20	7	0	7
Sum	90	23	2	25

The result shows that both the time priority and the order size play a role in the allocation. The higher time priority of Order 1 gives it a bigger share than Order 3. However, since the order size matters as well, Order 3 gets still a bigger share than Order 2, notwithstanding the lower time priority. The last table below compares the results of the three allocation methods for the current example.

Order Priority	Order Quantity	Time Allocation	Time-Pro-Rata Allocation	Pro-Rata Allocation
Order 1	20	20	10	6
Order 2	20	5	7	5
Order 3	50	0	8	14

7.5.4 Time Allocation

The time allocation method first sorts the eligible orders by their priority time stamp, orders with an older priority time stamp coming first.

It then determines the allocation for one eligible order after the other in the sequence that they have just been sorted. Each order receives an allocated quantity that is equal to its open quantity, provided that the quantity left to be allocated after the previous orders in the list got their share, is sufficient. If that quantity is not sufficient, then the order is allocated whatever remaining quantity was left to be allocated. In this way, it is possible that orders, which are last in the list, receive nothing.

Note that the term “Time Allocation” is a synonym of the term “Price-Time Allocation”. The term “Time Allocation” is applied here, because price priority is something that is a common feature of all matching procedures in T7, independent of the order allocation method. What distinguishes the time

allocation method from other order allocation methods is the priority time being the only criteria for the allocation among orders of the same price level.

This calculation of the allocated share can also be expressed with the help of a mathematical formula:

$$a_i = \text{MIN}[q_i, A_i]$$

where a_i is the quantity that is allocated to the order at position i in the sorted list of eligible orders,

MIN is the minimum function, i.e., $\text{MIN}[X, Y]$ is either X or Y , whichever is smaller,

q_i is the open quantity of the order at position i in the sorted list of eligible orders,

$A_i = \left(A - \sum_{k=1}^{i-1} a_k \right)$ is the quantity available to be allocated to the order at position i in the sorted list of eligible orders, which is given by the total quantity to be allocated A minus the sum of the quantities that were already allocated to the orders, which have a higher priority.

Example 7-9:

A quantity of 25 is to be allocated among three orders in the order book with a total open quantity of 90. Their time priority is given by the sequence in the following list, highest time priority first:

- Order 1, Quantity 20
- Order 2, Quantity 20
- Order 3, Quantity 50

For the time allocation, these orders are sorted by time priority. The first order is fully allocated. The remaining quantity is given to the second order, and since nothing is left, the third order receives nothing.

Order Priority	Order Quantity	Quantity Available To be Allocated	Allocated Quantity
Order 1	20	25	20
Order 2	20	$25 - 20 = 5$	5
Order 3	50	$25 - 20 - 5 = 0$	0

Since order 3 has the lowest time priority, it receives nothing, even though it is the largest order.

7.5.5 Order Allocation in an Uncrossing Trade

The quantity to be matched in an uncrossing trade is either the accumulated quantity of buy orders that can be executed at the auction price, or it is the quantity of sell orders that can be executed at the auction price, whichever is lower. The traded quantity is allocated to the executable orders as follows:

- Orders with a limit price that is better than the auction price, higher in the case of buy orders and lower in the case of sell orders, are fully executed.
- Orders with a limit price that is equal to the auction price are allocated according to the applicable allocation procedure.
- Orders with a limit price that is worse than the auction price, lower in the case of buy orders and higher in the case of sell orders, are not executed at all.

Example 7-6:

For FESX Jun27, the order book contains the following orders:

- *Buy order book:*
 - *Order 1, buy 15 contracts at price 3126*
 - *Order 2, buy 10 contracts at price 3126*
 - *Order 3, buy 15 contracts at price 3125*
 - *Order 4, buy 20 contracts at price 3125*
- *Sell order book:*
 - *Order 5, sell 35 contracts at price 3124*

The determination of the auction price and quantity yields an execution of 35 contracts at an auction price of 3125. Prices below 3124 or above 3125 would not reach the objective of Uncrossing. A price of 3124 or between 3124 and 3125 would not reach the objective of Price Continuity. Only a price of 3125 reaches both objectives. The execution of the individual orders is then done as follows:

- *The better-priced buy orders 1 and 2 with an accumulated quantity of 25 are fully executed at the auction price of 3125.*
- *The remaining quantity of 10 is distributed among the second best priced orders 3 and 4, depending on the configured allocation method. For FESX, this is the time allocation method. Therefore, the remaining quantity of 10 is entirely allocated to order 3, which has the higher time priority as compared to order 4.*
- *Sell order 5 is fully executed at the auction price of 3125, which is better than the order's price limit.*

7.6 Volatility Interruption

7.6.1 Overview

The Volatility Interruption is a special mechanism that is applied during trading, in order to prevent large deviations of execution prices.

To this end, T7 compares each execution price to recent execution prices in the same instrument, and if the price difference is considered excessively large, it stops trading and automatically starts a volatility auction in the affected instrument.

T7 supports two different concepts of Volatility Interruption, one for the derivatives markets and another for the cash markets. The two concepts of volatility interruption are explained in detail in the

following subsections.

7.6.2 Volatility Interruption Functionality for Derivatives markets

For derivatives markets, there are two Volatility Interruption Models in place: The Time Window Volatility Interruption Model and the Static Volatility Interruption Model. Both can be combined.

7.6.2.1 Time Window Volatility Interruption Model

In the Time Window Volatility Interruption Model, the new trade price is compared with the trade prices of all those trades in the same instrument, that are not older than a configured time window. Two separate fixed-length time windows are applied for each product, a short and a long window, in order to account for different liquidity scenarios that might occur in an instrument. If there is a trade in either of these time windows with a trade price that differs from the new trade price by more than the maximum allowed price deviation, a volatility interruption is triggered. In more detail, the processing is as follows.

Before T7 executes an incoming order at a new execution price, the central matching engine checks the new execution price against all execution prices in the same instrument that occurred in a short time interval before the current transaction. This includes the executions of the incoming order that have already occurred at different prices.

If T7 finds an execution price in one of the time intervals, which differs too much from the new execution price, then a Volatility Interruption is applied as follows:

1. The execution at the offending new execution price and any further executions of the incoming order are prevented.
2. The instrument state is changed to Volatility Auction. Depending on the instrument where the volatility condition is detected, the state change is done either only for the concerned instrument or for all simple instruments of the product. Exceptions to the latter case are simple instruments that are neither in the state Continuous, nor in an auction state or an auction freeze state, e.g. expired instruments. Complex instruments may also change their states, due to the automatic dependency of their states on the states of their leg instruments (see chapter *Instrument States of Complex Instruments* in the *T7 Functional Reference Part 2*).
3. The incoming order is written to the book, or in case of an IOC order, it is cancelled. Executions of that order that had been done at other prices before the condition was detected remain valid.

The prevention of the offending execution means in effect that the cause of a Volatility Interruption is not visible in the public trade volume reporting.

7.6.2.2 Static Volatility Interruption Model

The Static Volatility Interruption Model prevents, apart from preventing sharp price movements within short time, also unintended large price movements across the entire business day.

The trigger mechanism for Volatility Interruptions in this model is based on static price ranges around reference prices defined by the exchange. A Volatility Interruption is triggered once the allowed static price deviation is exceeded. The execution of the incoming order is prevented and the affected instrument, or all instruments of the affected product, are automatically moved from instrument state

Continuous to a Volatility Interruption auction.

Reference prices for determining the static Volatility Interruption are only updated over the trading day based on the following hierarchy:

1. Last auction price (this includes volatility auction prices)
2. Previous day's closing price
3. Previous day's settlement price
4. Settlement price of the nearest expiry

Configuration Data:

The information, whether and which volatility interruption functionality is enabled for a product, and if so for which instrument, and whether a volatility auction is started in all instruments of the product or only in the affected instrument, is available in the Trading Parameters File, which is part of the Products and Instruments Files for Eurex and EEX on the Eurex website (see chapter 1.2 Usage Notes).

7.6.3 Volatility Interruption Functionality for Cash Markets

The concept that is used by the cash markets triggers a volatility interruption if a potential trade price lies outside predefined fixed or floating volatility boundaries.

7.6.3.1 Single Volatility Interruption Model

During continuous trading, it is checked whether the potential trade price lies within a predefined floating volatility range around the last price. In addition, it is checked whether the potential trade price lies also within a predefined range around the last auction price (fixed range). If at least one of the conditions is not fulfilled, trading is interrupted by a *volatility auction*.

A similar procedure applies during auction call phases, i.e., a volatility interruption is initiated if the potential auction price⁸ lies outside the floating and/or fixed price range at the end of an auction call phase. In such a case, the auction call phase is followed by another call phase with the *volatility indicator* set. It has a predefined duration. Volatility interruptions in an auction are particularly announced.

If the auction price still lies outside the price range, an extended volatility auction is initiated, either until the order book is not crossed anymore or until the auction is terminated manually by an exchange operator.

Extended volatility boundaries are calculated at volatility auction termination. Upper and lower extended volatility boundaries are calculated around the last traded price and using the floating volatility ranges multiplied by an extended volatility factor.

7.6.3.2 Automated Corridor Expansion Volatility Model

The *Automated Corridor Expansion* (ACE) volatility model works with a cascade of predefined volatility corridors. The initial volatility auction of ACE is triggered depending on the predefined *initial dynamic volatility percentage*, which can be set to a different percentage value than that of the first price range corridor. If, at the end of the first *volatility auction* resp. at the end of the auction with *volatility indicator* set, the potential auction price still lies outside the predefined price range corridor, a cascade of a

⁸ Also called Indicative Auction Price. This document applies the term Potential Auction price.

predefined number of follow-up volatility auctions is initiated, each with a more and more extended predefined volatility range corridor.

If the auction price still lies outside the predefined price range corridor of the last of the cascading volatility auctions, an extended volatility auction is initiated, either until the order book is not crossed anymore, but not in intraday or closing auctions, or until the auction is terminated manually by an exchange operator, just as for the *Single Volatility Interruption* model.

An immediate termination of an ACE volatility interruption is performed when a regular auction (e.g. intraday auction or closing auction) is scheduled. The termination of an ACE volatility interruption at the end of the trading day (product state *Closing*) is performed in the same way as for the *Single Volatility Interruption* model, i.e., the volatility interruption is terminated without a price determination.

Set Up Information:

The Automated Corridor Expansion (ACE) volatility model is enabled per instrument by the exchange and requires the predefinition of the initial dynamic volatility percentage and the optional predefinition of cascading volatility corridors by the exchange for each of the following trading phases: Continuous trading, Opening auction, Intraday auction, Closing auction. Up to ten volatility corridors can be configured, defined in percent as the maximum allowed deviation to the last traded price (plus and minus), with a specific duration for each corridor.

The information about the configuration is available in the Static Reference Data files on the Cash Market website, see chapter 1.2 Usage Notes.

For Continuous Auction trading models, there is no volatility interruption functionality.

7.6.4 Automatic Order Deletion

Depending on configuration by the exchange, a volatility interruption leads to the immediate deletion of all quotes and non-persistent orders in an affected instrument, such that only persistent orders are kept.

Furthermore, relevant for derivatives markets, the same occurs to all quotes and non-persistent orders of all the complex instruments that have at least one leg instrument, the state of which is moved to Volatility Auction.

Set Up Information:

For Eurex and EEX products, quotes and non-persistent orders are automatically deleted by the T7 system when a volatility auction is started.

For Xetra products and for products traded on BSE, MSE, and WBAG with its partner exchanges, quotes and non-persistent orders are not automatically deleted by the T7 system when a volatility auction is started.

7.7 Self-Match Prevention (SMP)

Self-match prevention (SMP) allows to prevent that certain own orders of the same instrument match against each other. Please note that the term “orders” includes quotes in this chapter, see chapter 7.1. T7 supports various types of SMP:

- Type A.
- Type B.
- Market-wide SMP.

The SMP type is defined by each exchange per market.

Set Up Information:

SMP can be switched ON and OFF for certain business units by the exchange.

Eurex supports self-match prevention type A for selected products. Eurex publishes in the Functional Product and Instrument file whether self-match prevention is enabled for a product.

Xetra, BSE, MSE, and WBAG with its partner exchanges support self-match prevention type A for all products traded in trading model Continuous Trading with Auctions.

Frankfurt does not support self-match prevention.

EEX supports self-match prevention type A.

Nodal Exchange supports self-match prevention type B.

Market-wide SMP:

Market-wide SMP is supported by Eurex and by EEX.

Self-Match Prevention can be used for Retail quotes and orders, too, but is not applied between RLP quotes/orders and RMO orders in *Continuous* trading.

7.7.1 SMP type A

The self-match prevention of type A is an *optional* functionality, which allows a business unit to prevent that certain own orders of the same instrument match against each other. It is supported at order entry or modification during continuous trading, including cross- and pre-arranged trades, but not in any matches in an auction nor order book uncrossing. Note however that the self-match prevention mechanism does not prevent matches of orders in different instruments against each other, which occur in the context of synthetic matching in derivatives markets; see chapters *Futures Spreads: Synthetic Matching in Continuous Trading* and *Inter-Product Spreads: Synthetic Matching* in the *T7 Functional Reference Part 2*.

When an incoming order (“incoming” in the extended sense as defined in chapter 7.1.4) and a book order could match against each other in the current trading phase, T7 checks whether they are owned by the same business unit and whether they carry the same optional, user supplied SMP ID. If that is the case, the match between the two orders is prevented in an SMP event.

The SMP instruction of the incoming aggressive order or quote determines the SMP processing. Exchanges can define which SMP instructions are allowed. The following SMP instructions are

supported:

- Cancel Aggressive and Passive (CAP)
- Cancel Aggressive (CA)
- Cancel Passive (CP)

In case no SMP instruction is defined but a SMP ID is entered, a default handling is defined by the exchange. Independent from any specific SMP instruction, the point in time of verifying whether a SMP event exists will depend on the orderbook allocation scheme.

In case of a *time priority* orderbook allocation, the incoming aggressive order is executed order by order against passive orders on the opposite orderbook side of the incoming order in accordance with their time priority until the incoming order is facing an execution against a passive order triggering a SMP event. Thus, in case of a time priority orderbook allocation, the SMP event check is performed order-by-order.

In case of a *pro-rata* or *time pro-rata* orderbook allocation, the existence of a SMP event is performed immediately before executing the incoming aggressive order against passive orders resting on the opposite side of the orderbook. Therefore, the orders are adjusted / deleted and the pro-rata algorithm is performed again thereafter.

SMP instruction	Time allocation	Non-time allocation
CAP	Order-by-order, both orders will be reduced/netted	Per match price level, upfront, both orders will be reduced/netted
CA	Order-by-order, remaining quantity of incoming order will be cancelled	Per match price level, upfront, remaining quantity of incoming order will be cancelled
CP	Order-by-order, incoming order will completely cancel the resting orders with the same SMP ID	Per match price level, upfront, incoming order will completely cancel the resting order(s) with the same SMP ID.

Set Up Information:

Each exchange will define its own default SMP Instruction.

7.7.1.1 Example: Cancel Aggressive and Passive (CAP)

In case of an SMP event, the quantity of both, aggressive and passive, orders will be reduced until at least one order is completely cancelled.

Orderbook Allocation Time priority and SMP Deletion Instruction CAP:

To resolve a detected SMP event, the quantity of both, incoming aggressive and passive orders, will be reduced until at least one order is completely consumed. Provided quantity is still available on the incoming side, the execution of the incoming order against the orderbook side opposing the incoming order will continue.

Example: **CCCFR incoming Sell Limit order 500@7.3 with SMP ID 123 and CAP instruction**

Initial order book							Final order book						
Business Unit	SMP ID	SMP instruction	BID qty	BID price	ASK price	ASK qty	Member	SMP ID	SMP instruction	BID qty	BID price	ASK price	ASK qty
AAAFR			100	7,5			AAAFR			100	7,5		
BBBFR			200	7,5			BBBFR			200	7,5		
CCCFR	123	CA	50	7,5			CCCFR	123	CA	50	7,5		
							CCCFR	123	CAP			7,3	150
DDDFR			100	7,2			DDDFR			100	7,2		

(The incoming order with restriction CAP is **not** displayed in the initial order book, but only sitting orders)

Orderbook Allocation Pro-Rata / Time Pro-Rata and SMP Deletion Instruction CAP:

To resolve a detected SMP event, the quantity of both, incoming aggressive and passive order will be reduced until at least one order is completely consumed. Afterwards, the pro-rata matching weights of each passive order involved in the match event will be calculated in accordance with the pro-rata allocation scheme and the match event will be executed providing that there is still some quantity left on the incoming side.

Example: **CCCFR incoming Sell Limit order 200@7.3 with SMP ID 123 and CAP instruction**

Initial order book							Final order book						
Member	SMP ID	SMP instruction	BID qty	BID price	ASK price	ASK qty	Member	SMP ID	SMP instruction	BID qty	BID price	ASK price	ASK qty
AAAFR			100	7,5			AAAFR			50	7,5		
BBBFR			200	7,5			BBBFR			100	7,5		
CCCFR	123	CA	50	7,5			CCCFR	123	CA	50	7,5		

(The incoming order with restriction CAP is **not** displayed in the initial order book, but only sitting orders)

7.7.1.2 Example: Cancel Aggressive (CA)

This SMP deletion instruction will result in the cancellation of the remaining quantity of the incoming order or quote in case an SMP event occurs.

Orderbook Allocation Time priority and SMP Deletion Instruction CA:

The remaining quantity of the incoming aggressive order will be cancelled in case of the incoming aggressive order is facing a passive order on the opposite orderbook side of the incoming order triggering a SMP event (order-by-order SMP event check).

Example: **CCCFR incoming Sell Limit order 500@7.3 with SMP ID 123 and CA instruction**

Initial order book														
Member	SMP ID	SMP instruction	BID qty	BID price	ASK price	ASK qty								
AAAFR			100	7,5			Trade 100@7.5 Trade 200@7.5 Cancel aggressive 200	AAAFR			100	7,5		
BBBFR			200	7,5				BBBFR			200	7,5		
CCCFR	123	CA	50	7,5				CCCFR	123	CA	50	7,5		
DDDFR			100	7.2				DDDFR			100	7.2		

(The incoming order with restriction CA is **not** displayed in the initial order book, but only sitting orders)

Orderbook Allocation Pro-Rata / Time Pro-Rata and SMP Deletion Instruction CA:

No execution, as a resting SMP order sits on the match price level.

Example: **CCCFR incoming Sell Limit order 200@7.3 with SMP ID 123 and CA instruction**

Initial order book

Member	SMP ID	SMP instruction	BID qty	BID price	ASK price	ASK qty
AAAFR			100	7,5		
BBBFR			200	7,5		
CCCFR	123	CA	50	7,5		
DDDFR			100	7,2		

Cancel aggressive 200

Final order book

Member	SMP ID	SMP instruction	BID qty	BID price	ASK price	ASK qty
AAAFR			100	7,5		
BBBFR			200	7,5		
CCCFR	123	CA	50	7,5		
DDDFR			100	7,2		

(The incoming order with restriction CA is **not** displayed in the initial order book, but only sitting orders)

7.7.1.3 Example: Cancel Passive (CP)

In case of an SMP event, this instruction will result in the cancellation of book order(s) or quote(s) on that match price level on the opposite side of the orderbook.

Orderbook Allocation Time priority and SMP deletion instruction CP:

In case the incoming aggressive order is facing a passive order on the opposite orderbook side of the incoming order triggering an SMP event (order-by-order SMP event check), the corresponding passive order will be deleted entirely, regardless of the size of the incoming aggressive order triggering the SMP event. Afterwards, the execution of the incoming order will continue. The incoming order will be executed, as long as quantity in the order book exists, and the remaining quantity will be written into the order book.

Example: **CCCFR incoming Sell Limit order 500@7.3 with SMP ID 123 and CP instruction**

Initial order book													
Member	SMP ID	SMP instruction	BID qty	BID price	ASK price	ASK qty							
AAAFR			100	7,5									
BBBFR			200	7,5									
CCCFR	123	CA	50	7,5									
DDDFR			100	7,2									

Final order book													
Member	SMP ID	SMP instruction	BID qty	BID price	ASK price	ASK qty							
AAAFR			100	7,5									
BBBFR			200	7,5									
CCCFR	123	CA	50	7,5									
CCCFR	123	CP			7,3	200							
DDDFR			100	7,2									

(The incoming order with restriction CP is **not** displayed in the initial order book, but only sitting orders)

Orderbook Allocation Pro-Rata / Time Pro-Rata and SMP Deletion Instruction CP:

The passive orders triggering the SMP event will be deleted entirely on that price-level (there might be more than one passive order satisfying the SMP criterion). Afterwards, the pro-rata matching weights of each remaining passive order involved in the match event will be calculated in accordance with the pro-rata allocation scheme and the match event will be executed.

Example: **CCCFR incoming Sell Limit order 200@7.3 with SMP ID 123 and CP instruction**

Initial order book													
Member	SMP ID	SMP instruction	BID qty	BID price	ASK price	ASK qty							
AAAFR			100	7,5									
BBBFR			200	7,5									
CCCFR	123	CA	50	7,5									
DDDFR			100	7,2									

Final order book													
Member	SMP ID	SMP instruction	BID qty	BID price	ASK price	ASK qty							
AAAFR			33	7,5									
BBBFR			67	7,5									
CCCFR	123	CA	50	7,5									
DDDFR			100	7,2									

(The incoming order with restriction CP is **not** displayed in the initial order book, but only sitting orders)

7.7.1.4 FOK and Iceberg orders in SMP type A

For FOK orders, SMP is applied, if the FOK order is potentially fully executable considering all price levels; otherwise, if the FOK order is not potentially fully executable considering all price levels, it is deleted without any impact on any order in the order book.

For incoming Iceberg orders, the full quantity – display and hidden – is taken into consideration during the SMP processing, essentially treating them like a regular order with SMP.

For sitting Iceberg orders, the display quantity is cancelled in case of SMP processing. The same quantity is also cancelled from the incoming order. If this results in a display quantity of zero for a resting Iceberg order and potentially more quantity could be executed but is prevented due to SMP, that quantity is cancelled from the hidden part following the peak refill rules.

7.7.2 SMP type B

The self-match prevention of type B is – once defined for a group of business units (SMP group) – a *mandatory* functionality, which prevents matching of orders of the same instrument against each other within this SMP group. No Cross ID has to be supplied to enable it. It is supported at order entry or modification in all instrument states. Note however that the self-match prevention mechanism does not prevent matches of orders in different instruments against each other, which occur in the context of synthetic matching in derivatives markets; see chapters *Futures Spreads: Synthetic Matching in Continuous Trading* and *Inter-Product Spreads: Synthetic Matching* in the *T7 Functional Reference Part 2*.

When an incoming order and a book order could match against each other now or in a later trading phase, T7 checks whether they are owned by the same SMP group. If a potential opportunity for a self-match exists for two opposing orders, then the situation is resolved; this is done either by deleting one of the involved orders or alternatively both, depending on a configurable parameter at business unit level.

7.7.3 Market-wide Self-Match Prevention

The market-wide SMP works like the SMP type “A” but is based on market-wide SMP IDs, i.e., orders or quotes flagged with the same market-wide SMP ID will be prevented from matching in the same instrument irrespective of whether the orders or quotes were sent by the same or by a different trading participant. The mechanism of preventing orders from matching with each other follows the same logic as for SMP Type “A”: Both the quantity of the incoming order and the quantity of the potentially matching resting order are reduced or are deleted instead.

The market-wide SMP and SMP type “A” are mutually exclusive for each order or quote. Orders or quotes tagged with SMP type “A” will not trigger any SMP action when interacting with orders or quotes tagged with market-wide SMP IDs, even if the same numerical ID is applied.

The market-wide SMP IDs are created by the Admin Users of the trading participants, who tell other trading participants the SMP ID (outside T7), so that they can search and register for these market-wide SMP IDs in the T7 Admin GUI. The Admin User can define a market-wide SMP ID by himself, as long as it is a valid SMP ID, or he can leave the definition of a valid market-wide SMP ID to the T7 system.

The lifecycle of a market-wide SMP ID starts on the day of its creation, where the market-wide SMP ID

is available for registration for other trading participants but not yet active (pending active). Only on the following business day the new market-wide SMP ID can be used (active). Each market-wide SMP ID has an expiry date. The expiry date is the last date of usage of a market-wide SMP ID. It is possible to update the expiry date on the expiry day. One day after the expiry date the market-wide SMP ID will be removed from T7 and cannot be used any longer. All orders or quotes using the removed market-wide SMP ID will be removed alongside the expired SMP ID.

7.8 Passive Liquidity Protection (PLP)

In order to encourage Liquidity Providers to choose tighter quote spreads and larger volumes, the Passive Liquidity Protection (PLP) is put in place for certain products. The Passive Liquidity Protection works as follows:

- If incoming orders could potentially match in the central order book, either with quotes or orders, they are deferred once by a very small amount of time (milliseconds or even less) before they finally enter the order book. Please note that nobody is informed about the coming deferred order.
- If later order modifications or deletions refer to a deferred order still waiting for being released, then these later order modifications or deletions become deferred, too.
- Quotes are never deferred, but they are hindered to match aggressively by treating them always as Book-or-Cancel quotes. The respective quote or quote side is rejected according to the configuration of the single-sided quote rejection policy, cf. chapter 5.4.2.1.

While a transaction is deferred, a mass cancellation event can occur. There are four types of mass cancellation events, and the following table outlines which handling T7 applies when the deferral of an order transaction is finished:

Event Type	Deferral Handling
Mass Order Deletion request	Match as IOC
Session Logout	Reject for further processing
Risk Event at BU level with order deletion	Reject for further processing
GUI Stop Trader/BU button	Reject for further processing

Mass Order Deletion request:

In case of an incoming Mass Order Deletion request while an order is deferred, T7 validates the deferred orders like Immediate-Or-Cancel orders (IOC). Thus, the orders are matched after the deferral, but any remaining quantity is deleted, and the orders are not written to the order book.

Session Logout, Risk Event at BU level with order deletion, GUI Stop Trader/BU button:

If such a mass cancellation event occurs, all deferred orders are rejected after the deferral. That means, that even if a deferred order would have been executable, it would not be matched.

No impact on *first-come-first-serve* principle

Please note, that despite the deferral of aggressive order transactions, there is still an incentive of using an optimized latency profile for aggressive liquidity providers for trading against passive client orders improving the bid – ask spread. All aggressive order transactions targeting client orders in the central order book are deferred by the *same* deferral time *without* changing the transaction sequence. Thus, the *first* aggressively acting order targeting the client order is also the *first* order re-entering the matching engine of T7 after the deferral time elapsed. *This* order is executed first against the client order still passively sitting in the order book. – It is only the overall success rate to match against a stale quote side which is reduced with the introduction of the *Passive Liquidity Protection* concept.

Set Up Information:

Passive Liquidity Protection (PLP) is activated on Eurex and available for cash and derivatives markets.

The deferral time period and the products for which PLP is enabled are defined by the exchange.

7.9 Automatic Detection of Stressed Market Conditions

T7 automatically detects stressed market conditions when certain triggering conditions are met. The triggering conditions are specific per type of the market, derivatives market or cash market.

7.9.1 Derivatives markets

In general, stressed market conditions in derivative markets apply product-wide, for all instruments of a product. This applies irrespective of whether the triggering conditions for stressed market conditions may relate to a single instrument only.

Stressed market conditions for a product are set when one of the following triggering conditions is met:

- **End of a volatility interruption**
Stressed market conditions are set when the instrument is switched to continuous trading from a previously entered volatility interruption.
This trigger applies to equity index futures, single stock futures and ETF futures.
- **Simultaneous significant short-term change of price and volume**
The procedure to detect a significant short-term change of price is similar to the procedure used for the detection of volatility interruptions, but based on a separate set of parameters (considered time interval and allowed price deviation simultaneously).
The detection of a significant short-term change of volume refers to the traded volume accumulated during a predefined time interval and compares the volumes in the last recorded time interval against the volume in the immediately preceding time interval. If the volumes differ by more than the allowed deviation, then stressed market conditions are set.
Only trades from simple instrument orders or quotes are considered for this trigger.
This trigger applies to equity index futures, single stock futures and ETF futures.
- **Stressed Market Signals in a related product**
In case a futures product is in stressed market conditions and there is a related options product with the same underlying, then the options product is automatically set in stressed market conditions (e.g., for OESX the corresponding related product is FESX). Additionally, a volatility interruption in the futures product sets the corresponding related options product into stressed market conditions.
This trigger applies to ETF options, equity options, equity index options.

7.9.2 Cash Markets

In general, stressed market conditions in cash markets apply per instrument.

The following two conditions must be met simultaneously for triggering stressed market conditions in a cash market instrument:

- i. The instrument has entered an extended volatility interruption.
- ii. Exchange defined thresholds are exceeded.

Stressed market conditions are evaluated when the instrument is switched to Freeze during an extended volatility interruption.

8. Special On-book Trading Services

As part of the on-book trading, various special on-book trading services are offered by T7 to enable and improve trading for trading participants.

8.1 Eurex Improve

Eurex Improve is a client order flow execution facilitation service, also known as Client Liquidity Improvement Process (CLIP). It enables an in-house proprietary desk of a facilitating bank/broker to back the client's order flow by agreeing upon the execution of the client's order flow of a fixed quantity and price against an order of the bank/broker, yet giving other market participants the opportunity to get involved in the execution of the client's order flow by pre-announcing the agreement to all market participants and by executing the client's and the bank/broker's orders in the central order book which is open to all market participants.

[Set Up Information:](#)

Eurex Improve is available for Eurex.

8.1.1 Parties and their roles in Eurex Improve

The Eurex Improve functionality involves three different parties:

- **Client ("client"):** The clients request and agree upon the execution of their client order flow, defined by quantity and price, in the central order book with a bank/broker. Usually, a client is represented by the client's bank/broker registered at Eurex.
- **Facilitating Bank/Broker ("bank/broker"):** The bank/broker answers and agrees upon the client's request. In contrast to the client's order, the execution of the bank/broker's order is subject to price competition with other market participants.
- **Other market participants:** All other market participants, especially liquidity providers in the respective product, have the opportunity to get involved in the execution of the client's order flow by receiving a pre-announcement of the agreement and entering orders or quotes at a better price than the agreed price into the central order book.

The client and the bank/broker can be identical traders, yet the designation *other market participants* excludes the client trader and the bank/broker trader.

In consultation with the participants, the exchange defines groups of participants' business units, called Eurex Improve BU Groups. These groups serve to define the allowed Eurex Improve relationships between counterparties in Eurex Improve. The exchange can define that Eurex Improve can only be used in the relationships defined by the Eurex Improve BU Groups.

8.1.2 The Eurex Improve process

The Eurex Improve process comprises three phases:

- Initiation.
- Price Improvement Period.
- Execution.

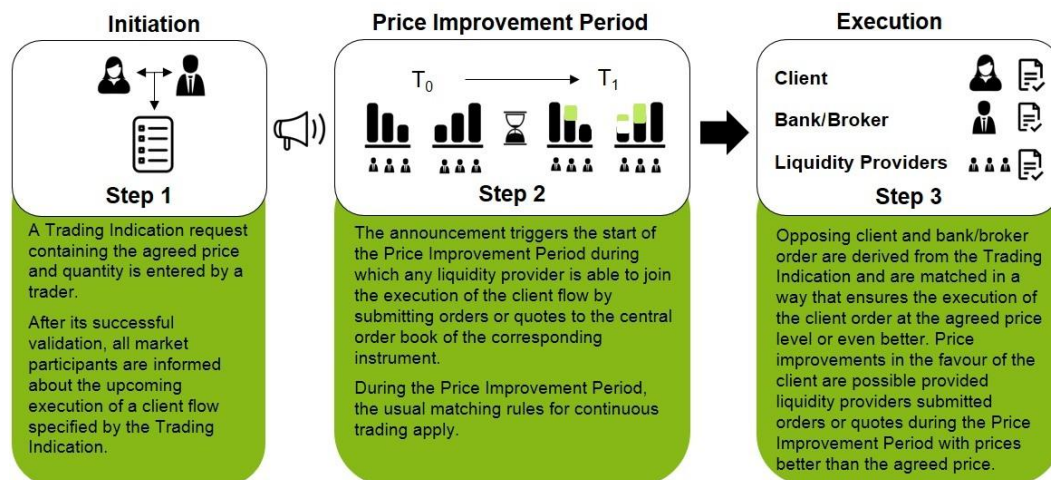


Figure 8-1: The Eurex Improve Process in three phases

8.1.2.1 Phase 1: Initiation

Outside the T7 system, the client and the bank/broker agree upon the execution of the client's order flow at a fixed quantity and at a price better than the current price on the client side of the central order book. Then the bank/broker is entering a CLIP trading indication containing both sides, the client side and the bank/broker side, into the T7 trading platform (double-sided CLIP trading indication). Alternatively, it is also possible to enter two one-sided Clip trading indications opposing each other, one side representing the client side and the opposite side representing the bank/broker side. In the latter case, a cross reference to the other side must be included for identification purposes. On bank/broker side, only *Proprietary* or *Market Maker* is allowed as trading capacity, and on the client side, only *Agency* is allowed as trading capacity.

Initiation: Consolidation and Validation

In case that two one-sided Clip trading indications are entered, the T7 system considers the Eurex Improve agreement made, if the specifications of two CLIP trading indications (e.g. instrument, price and quantity) correspond to each other, and if they are entered within the *CLIP Maximum Arrangement Time*. Then the two CLIP trading indications are consolidated, otherwise the CLIP trading indications are deleted without consequences. A double-sided CLIP trading indication always fulfills this condition.

The consolidated CLIP trading indication has to pass the following validations, otherwise it is rejected:

- The agreed price has to be strictly better than the current bid/ask on client side in the central order book, i.e., in case of a client buy side, the agreed price has to be strictly higher than the best bid price in the central order book, resp. in case of a client sell side, the agreed price has to be strictly lower than the best ask price in the central order book. In complex instruments, this applies to respective leg instrument order books, in case there are no orders in the complex instrument. In case of a complex instrument, it is made transparent by a flag in the CLIP response whether a synthetic price is used for the validation against the agreed price.

- The agreed quantity has to be greater or equal than the *CLIP Minimum Quantity*, and smaller or equal than the *CLIP Maximum Quantity*.
- Client and Bank/broker must not have orders or quotes in the central order book for the respective product when entering the CLIP trading indication and are not allowed to enter orders or quotes for the respective product until the CLIP trading indication is deleted or rejected, or until the CLIP execution phase is over.

Initiation: CLIP Announcement

When the consolidated CLIP trading indication passed all validations successfully, a CLIP Announcement is sent to all other market participants, informing them about the upcoming execution of a client order flow.

The disclosure of the agreed price, the agreed quantity, and the client side in the CLIP Announcement may be mandatory or optional, and if optional, the disclosure depends on the decision of the submitter(s) of the CLIP trading indication.

8.1.2.2 Phase 2: Price Improvement Period

The Price Improvement Period starts immediately with the CLIP Announcement. Its duration is configured by the exchange and published to all market participants.

During the Price Improvement Period, all other market participants including the liquidity providers have the opportunity to get involved into the upcoming execution of the client order flow. They do this by entering or adjusting orders and quotes in the central order book on the bank/broker side. Orders or quotes on the client side are *not* involved, see below.

Please note that the central order book is not “frozen” in the Price Improvement Period, so that entering or adjusting orders and quotes may result in immediate normal matching. The two orders agreed upon in the CLIP trading indication have not entered the central order book, yet.

The client and the bank/broker involved in the CLIP trading indication are not allowed to enter orders or quotes into the central order book for the respective product in the Price Improvement Period.

In case of an instrument state change during the price improvement period (including a volatility interruption), then the Price Improvement Period is terminated immediately, and the announced execution of a client flow does not take place and pending CLIP trading indications are deleted.

8.1.2.3 Phase 3: Execution

Immediately after the end of the Price Improvement Period, the execution of the client order flow is performed in one single CLIP match event, considering on the client side *only* the client order flow, processed in two steps:

- Step 1: The bank/broker side of the CLIP trade indication is converted into an order with the agreed price and with a priority timestamp showing the time of the *beginning* of the Price Improvement Period. It is inserted into the central order book *without* performing possible matching.
- Step 2: The client side of the CLIP announcement is converted into an order with the agreed price and with a priority timestamp showing the time of the *end* of the Price Improvement Period. It is inserted into the central order book as incoming order *with* performing matching.

Since in the CLIP match event on the client side *only* the client order flow is considered, the complete matching of the client order flow is guaranteed. It may happen that in the meantime other orders or quotes with a better price than the client order flow had been entered into the central order book on the client side. In this case, the market is informed about a match event outside of the bid-ask price range.

Since other market participants may have entered or adjusted orders or quotes on the bank/broker side in the Price Improvement Period with a better price than the bank/broker order, it may happen that the client order is matched at better prices than the agreed price, and that the bank/broker order remains in the central order book, partially or even completely unmatched.

8.1.3 The Tolerable Price Concept

To compensate the disadvantage of the bank/broker that the bank/broker's order may be only partially or not at all matched at the agreed price, the bank/broker can specify a *Maximum Tolerable Price* in the CLIP trading indication. The *Maximum Tolerable Price* indicates up to which price level the bank/broker is willing to be executed against the client's order flow. The difference between the *Maximum Tolerable Price* and the agreed price may not exceed a *Maximum Tolerable Price Interval*, defined by Eurex.

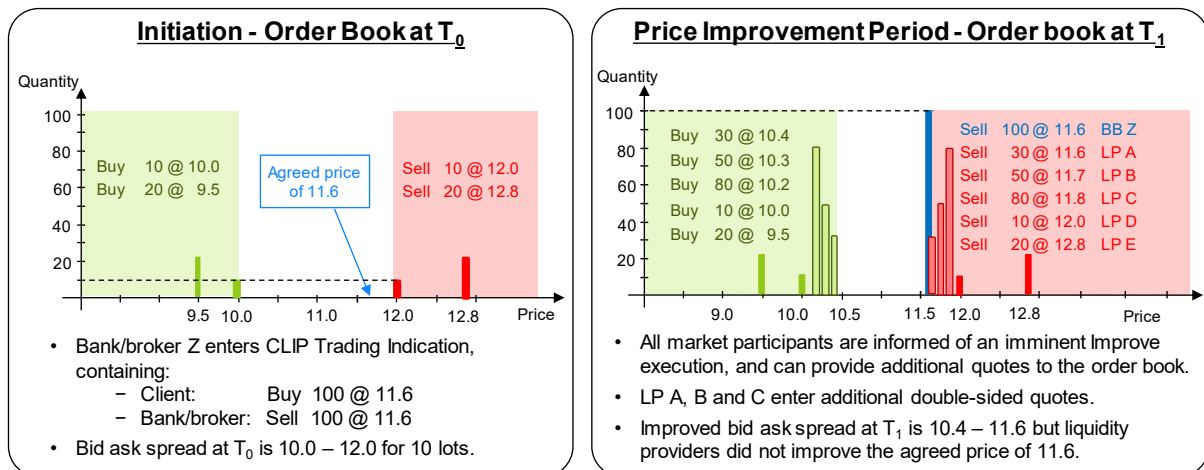
When the CLIP match event takes place at a price level better than the agreed price but no better than the *Maximum Tolerable Price*, and if this price level is met by orders or quotes entered during the Price Improvement Period, then an additional *Tolerable Broker Order* is considered in the CLIP Match Event at this price level. Its timestamp is the same as the initial bank/broker's order timestamp, i.e., the time of the *beginning* of the Price Improvement Period. Its quantity is calculated as a percentage of the (partial) match quantity of the client order at this price level. This *Tolerable Broker Quantity Percentage* is defined by Eurex.

Set Up Information:

The exchange configures the CLIP Maximum Arrangement Time, the CLIP Price Improvement Period Duration, the CLIP Minimum Quantity, the CLIP Maximum Quantity, the Maximum Tolerable Price Interval, the Tolerable Broker Quantity Percentage, and the usage details (mandatory or optional) of the disclosure of the agreed price, the agreed quantity, and the client side in the CLIP Announcement.

Example 1: Eurex Improve Match Event without Price Improvements by Liquidity Providers

The following example describes a CLIP match event which might occur in less liquid markets. It assumes that the price agreed between bank/broker and client is not improved during the price improvement period implying that the CLIP match event takes place inside the best bid – ask spread available after the price improvement period.



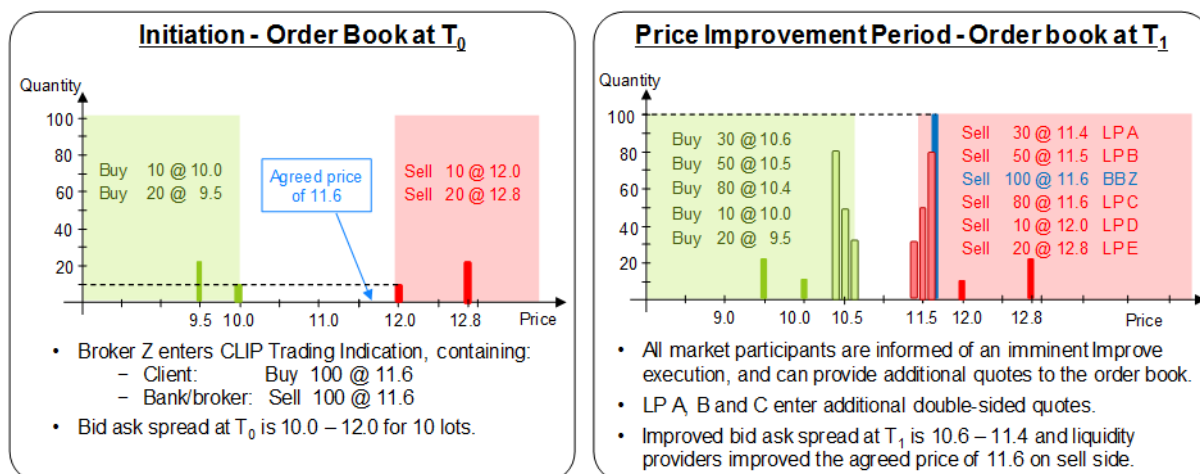
Bank/broker Z (“BB Z”) submits a CLIP trading indication with an agreed price of 11.6 and an agreed quantity of 100 lots. The client is on the buy side and the bank/broker on the sell side. The order book valid before the announcement at T_0 is depicted in the diagram on the left and the order book after the price improvement period at T_1 is given in the diagram on the right side.

The CLIP match event starts by converting the bank/broker side of a CLIP trading indication into a sell order with 100 @ 11.6 which is inserted into the central order book with an order priority time identical to the time of the announcement of the CLIP trading indication. Afterwards, the client side of the CLIP trading indication is converted into an incoming buy order with 100 @ 11.6 which is executed against the sell side of the order book. Since there was no price improvement during the price improvement period, the incoming client buy order is completely executed at 11.6 against sell order of the bank/broker. Because of the price time priority, the liquidity providers joining the order book during the price improvement period can only be considered in the execution against the client order, if they are improving the price on the proprietary side, i.e., if they are entering a sell order or sell quote with a price smaller than 11.6 (which was not the case in Example 1).

Executions	Buy Side	Sell Side
100 @ 11.6	Bank/broker Z (client side)	Bank/broker Z (proprietary side)

Example 2: Eurex Improve Match Event with Price Improvements by Liquidity Providers

The following example describes a CLIP match event where liquidity providers are improving the price agreed between the client and bank/broker on the proprietary side.



A CLIP trading indication is submitted by bank/broker Z with an agreed price of 11.6 and an agreed quantity of 100 lots. Again, the client is on the buy side, and the bank/broker on the sell side. The order book valid before the announcement at T_0 is depicted in the diagram on the left and the order book after the price improvement period at T_1 is given in the diagram on the right side.

Again, the CLIP match event starts by converting the bank/broker side of a CLIP trading indication into a sell order with 100 @ 11.6 and inserting it to the central order book. Afterwards, the client buy order with 1000 @ 11.6 is extracted from the CLIP trading indication and executed as an incoming order against the sell side of the order book. The resulting trades are summarized in the table below. The first match of the CLIP match event takes place at a price of 11.4 and a traded quantity of 30 lots. A second match is executed at a price of 11.5 with a traded quantity of 50 lots. The last match occurs at the agreed price level of 11.6, where 20 out of 100 lots of the sell order of Bank/broker Z are executed against the remaining client order. As indicated in Example 2, liquidity provider A and B submitted orders or quotes with a more competitive price compared to the agreed price of Bank/broker Z.

Executions	Buy Side	Sell Side
30 @ 11.4	Bank/broker Z (client side)	Liquidity Provider A
50 @ 11.5	Bank/broker Z (client side)	Liquidity Provider B
20 @ 11.6	Bank/broker Z (client side)	Bank/broker Z (proprietary side)

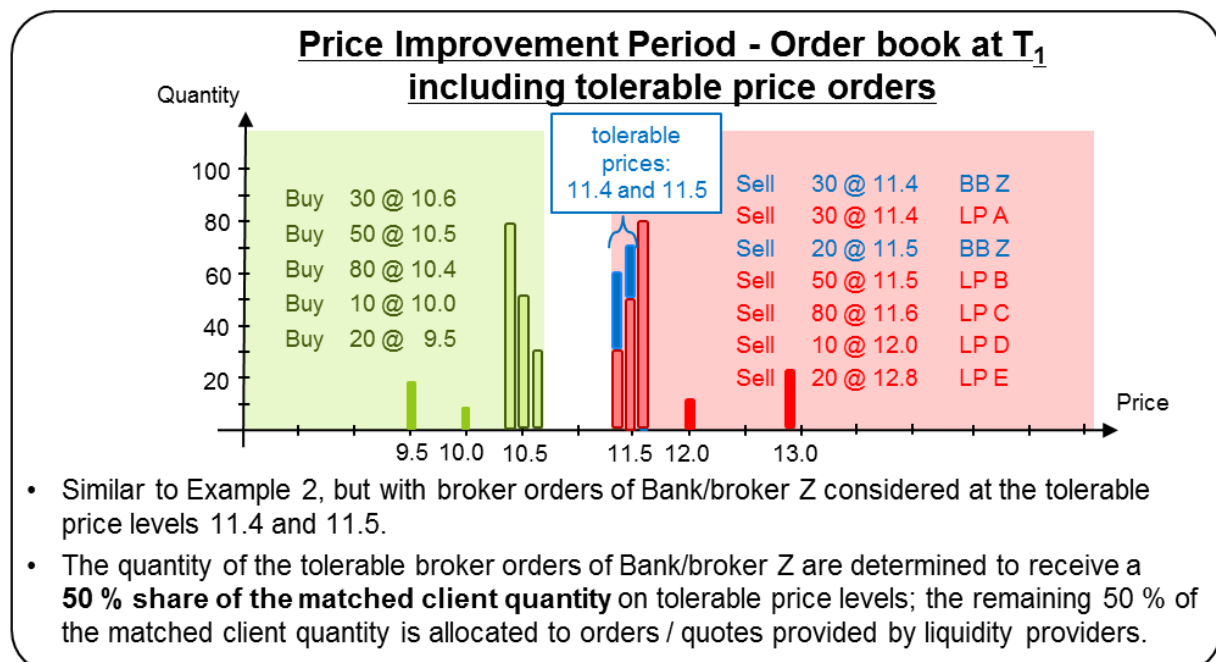
From a client point of view, instead of buying 100 lots at a price of 11.6, the client actually buys 100 lots at an average trade price of 11.49 which is below the originally agreed price of 11.6 and represents – from this point of view – a better price. The example also shows that the bank/broker side only received 20 lots at the agreed price of 11.6.

Example 3: Eurex Improve Match Event and Tolerable Price Concept

Example 3 describes a CLIP match event where the bank/broker is using the tolerable price concept. The order book situation before and after the price improvement period of Example 3 are the same as for Example 2. The CLIP trading indication submitted by Bank/broker Z is also assumed to be the same as in Example 2 except that Bank/broker Z is additionally specifying a maximum tolerable price of 11.4.

The diagram shows the order book situation after the price improvement period is concluded at T_1 . Tolerable proprietary orders are considered at tolerable price levels of 11.4 and 11.5. The tolerable proprietary quantity percentage is 50% of the matched client order quantity on each tolerable match price level.

As indicated in the picture, the CLIP match event is creating a tolerable proprietary order at price level 11.4 since 11.4 is a tolerable proprietary price level. The tolerable proprietary quantity at 11.4 is derived in that way that Bank/broker Z receives a 50 % share of the matched client order quantity on that price level. Since the quantity provided by the liquidity provider A on the tolerable price level of 11.4 is 30 lots and the client order quantity available for matching at 11.4 is 100 lots, the tolerable proprietary order receives 30 lots resulting in an overall execution of 60 lots at 11.4. The tolerable proprietary quantity at the next tolerable proprietary price level of 11.5 is derived by taking into account the remaining client order quantity of 40 lots available for matching of that price level. This results to a tolerable proprietary quantity of 20 lots, and to a partial execution of 20 out of 50 lots of the order of participant B at 11.5.



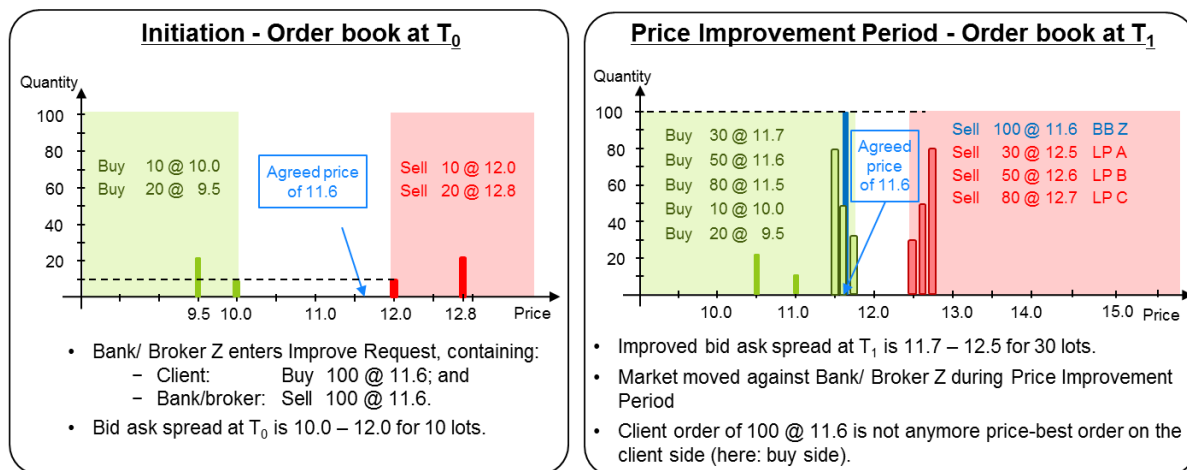
The executions of the CLIP match event are summarized in the table below. The remaining part of the proprietary order of 50 lots (not matched against the client flow) is deleted at the end of the CLIP matching event.

Executions	Buy Side	Sell Side
30 @ 11.4	Bank/broker Z (client side)	Bank/broker Z (proprietary side)
30 @ 11.4	Bank/broker Z (client side)	Liquidity Provider A
20 @ 11.5	Bank/broker Z (client side)	Bank/broker Z (proprietary side)
20 @ 11.5	Bank/broker Z (client side)	Liquidity Provider B

From a client point of view, instead of buying 100 lots at the agreed price of 11.6, the client actually buys 100 lots at an average trade price of 11.44, which is even better compared to Example 2. Compared to Example 2, the matched quantity of the proprietary side of the CLIP trading indication increased to 50 lots from 20 lots with an averaged trade price of 11.44 representing a quantity share of 50% of the incoming order when executed on tolerable price levels.

Example 4: Eurex Improve Match Event outside Bid-Ask Spread

Example 4 outlines the case that during the price improvement period the market is running away from the proprietary side of the bank/broker. Although it is assumed that such big market movements rarely occur within the small time interval of the price improvement period, it cannot be excluded.



The initial situation of Example 3 is the same as for Example 1 and 2. During the price improvement period, however, the market moved against the bank/broker with a shift of the best bid-ask spread from 10.0 to 12.0 toward 11.7 to 12.5 (shift of midpoint price / fair value from 11.0 to 12.1).

As indicated in the diagram on the right of the picture, the client order created by the CLIP match event on the buy side is not the buy order with the best price since a strong market movement is assumed. Consequently, and in accordance with the general CLIP matching procedure, the client buy order is now matched against the sell side of the order book at a price level outside the best bid-ask spread and completely executed against the best priced sell order in the order book which is the now outdated proprietary order of the bank/broker at 11.6. Such a CLIP match event outside the bid-ask spread is indicated separately in the T7 market data interfaces.

Executions	Buy Side	Sell Side
100 @ 11.6	Bank/broker Z (client side)	Bank/broker Z (proprietary side)

8.2 Xetra Retail Execution service

The Xetra Retail Execution service is a best execution offering for retail orders. It focusses on the needs of private investors and retail brokers. The service enables dedicated Retail Liquidity Providers (RLP) to enter quotes and orders (in short: RLP quotes) better than the price within the current order book for retail orders provided by dedicated Retail Member Organizations (RMO). The Xetra Retail Execution service is offered in the *Continuous Trading with Auctions* trading model.

The Xetra Retail Execution Service is offered also in Retail Early and Late Trading phases, with a different matching mechanism based on continuous Retail auctions.

Set Up Information:

The Xetra Retail Execution Service is available for Deutsche Börse Xetra only.

The exchange decides for which instruments in trading model Continuous Trading with Auctions the Xetra Retail Execution service is enabled.

There is no TES or Xetra EnLight trading for the Xetra Retail Execution service.

8.2.1 RLP quotes and RMO orders

RLP quotes are marked by the new Trading Capacity for Retail Liquidity Provision (L) and their validity is only Good-for-Day. For RLP orders, any auction-only or BOC trading restriction will be rejected. Double-sided as well as one-sided RLP quotes are allowed, but no zero quantities are allowed. RLP quotes will not interact with other RLP quotes or other non-retail orders in the orderbook in instrument state *Continuous*.

Retail orders (in short: RMO orders) are marked by the new Trading Capacity for Retail Agency (B). As Execution Restrictions, IOC, FOK, and BOC are allowed. Retail orders can match against both, an RLP quote, resulting in a retail Price Determination, or against other non-retail orders within the regular Xetra order book, resulting in a regular Price Determination.

While an instrument allowed for the Xetra Retail Execution service is in the instrument state *Continuous*, the RLP quotes can match against the RMO orders.

A retail price determination will only be possible during the instrument state *Continuous*.

RLP quotes are fully integrated in the normal matching process. However, they can only be executed against RMO orders. They will not have an advantage in price or timing over other quotes and orders.

For RLP quotes and orders, neither a modification of the Trading Capacity is allowed, nor an SMP definition. For RMO orders, a modification of the Trading Capacity is allowed, but only in pre and post trading, and the SMP functionality is supported, as for other non-retail orders. Mass quote deletions will delete RLP quotes only, not RLP orders.

Orders flagged as RMO orders, which are entered for an instrument not eligible for the Xetra Retail Execution service, will not be rejected but will be handled like a non-RMO order.

Please note that an RLP quote is able to exist together with a non-RLP quote within the same session. While non-RLP quotes replace each other within one session, RLP quotes do not replace non-RLP quotes, and are not replaced by them.

Automatic and mass deletions for RLP quotes are performed the same way as for Designated Sponsor quotes.

Trades resulting from the Xetra Retail Execution service are of the match type *Retail*. Special statistics for retail trading such as Retail Last Price, Retail Last Trade Quantity and Retail Last Trade Time is provided. In Clearing and Settlement, the account L (Retail Liquidity Provision) is mapped to P (Proprietary), and the account B (Retail Agency) is mapped to A (Agency).

The user administrators will have to assign the Trading Capacities (L, B) to their users. The Retail Liquidity Providers will use the existing *Cash Market Maker* role and the Retail Member Organizations will use the existing *Cash Trader* role. To use the new Trading Capacities (L, B) a registration as Retail Liquidity Provider respectively Retail Member Organization is necessary.

8.2.2 Order book consistency mechanism in Main Trading Hours

In case of a crossed order book situation (i.e., crossed RLP quotes / orders with other non-RMO orders in the order book) or a crossed RLP quote / order situation (i.e., RLP quotes / orders cross each other) there will be a mechanism to ensure the order book consistency in terms of pre-trade transparency and matching.

The table below specifies the two basic scenarios which need to be resolved using the new mechanism, and the corresponding rules:

Scenario	Order book consistency mechanism
Crossed book – When a non-retail order (incoming or resting) on one side crosses the limit of an RLP quote on the opposite side.	The respective side of the RLP quote / order will be disclosed with the best available limit of the opposite side of the order book.
Crossed quote – When two RLP quotes cross each other, i.e., when they would be executable against each other.	The last trade price (regardless of it being a retail or a non-retail last price) will be considered for the displayed limit of the quotes / orders within the crossed limits of these quotes / orders.

Independent from the displayed limit generated by mechanism, T7 will retain the actual (physical) limit of the RLP quote / order provided by the respective RLP on quote/order entry. T7 will revert the limit of the RLP quote / order to its original limit when the crossed situation is resolved. The quotes will be displayed in a price feed outside of T7.

8.3 Xetra Midpoint

The Xetra Midpoint service offers the possibility to execute orders at the midpoint of the currently available Xetra best bid/best ask price in the Central Limit Order Book (CLOB).

Set Up Information:

The Xetra Midpoint service is available for Deutsche Börse Xetra only.

The exchange decides for which instruments the Xetra Midpoint Service is enabled.

All traders entitled for trading in the Xetra CLOB by the existing Cash Trader role are entitled for Midpoint trading.

For Midpoint trading, separate Segment MICs are defined.

8.3.1 The Midpoint order book

Xetra Midpoint service offers a separate order book, in which orders can be executed not with price-time priority but with volume-time priority at the midpoint of the currently available best bid/best ask price of the Central Limit Order Book (CLOB) of Xetra (see chapter 7.4). The midpoint is rounded to the T7 tick size which may be more granular than the ESMA tick size. The Midpoint order book is a 'dark' order book, i.e., there is no pre-trade transparency as in the 'lit' Xetra CLOB. The orders in the Midpoint order book are not disclosed to other market participants by any orderbook interface or by any market data product.

Xetra midpoint execution takes place only in the instrument state *Continuous* of the trading model *Continuous Trading with Auctions*. Midpoint execution does neither happen in auctions, nor in volatility interruptions, nor in Trade-at-Close. Cross Requests are not available for Midpoint trading. Not only changes in the Xetra CLOB but also any valid incoming midpoint order triggers the detection for possible Midpoint executions.

Any Midpoint price which, after rounding to the T7 tick size, is equal to the best bid or to the best offer of the Best Bid Offer (BBO) spread in the Xetra CLOB is not considered a valid Midpoint price and no Midpoint execution takes place on the basis of this price.

Any Midpoint price which is outside the current volatility corridor does not result in a Midpoint match. The execution of Midpoint or Midpoint Sweep orders at the current midpoint in the Midpoint order book does not trigger any volatility interruption, nor does it trigger the adjustment of any Xetra reference prices (incl. Xetra Retail). Also, Midpoint executions will not trigger any Stop orders in the CLOB.

8.3.2 Order type *Midpoint* with two order subtypes

For Xetra Midpoint trading, there is a special order type *Midpoint*, and a special optional order attribute *Sweep* flag. Together, they define two order subtypes:

- Midpoint order. Order type *Midpoint*, with *Sweep* flag not set.
- Midpoint Sweep order. Order type *Midpoint*, with *Sweep* flag set.

Midpoint orders are entered into the Midpoint order book only ('dark'). They never enter the Xetra CLOB and never interfere with orders in the Xetra CLOB. Midpoint orders can be executed only by matching with other Midpoint or Midpoint Sweep orders in the Midpoint order book. Remainders of partial executions stay in the Midpoint order book.

Midpoint Sweep orders first make an attempt to match against sitting Midpoint orders in the Midpoint order book. If no such match is possible, or if the Midpoint Sweep order is matched in the Midpoint order book only partially, the Midpoint Sweep order with its full or remaining quantity is immediately forwarded to the Xetra CLOB ('dark-to-lit'), whereby its order type changes from *Midpoint* to *Regular*. The Sweep flag is not removed, so that the order is still recognizable as a former Midpoint Sweep order. Any modifications thereafter only apply to the order in the CLOB.

Due to synchronisation, there is no latency disadvantage for Midpoint Sweep orders inserted first into the Xetra Midpoint order book before entering the Xetra CLOB, compared to orders directly inserted into the Xetra CLOB.

Midpoint Sweep orders can be entered even if Midpoint trading is switched off. In this case, the Midpoint Sweep orders enter the CLOB directly.

Order limits of Midpoint orders do not influence the price finding in the Midpoint order book but only decide whether an order can take part in Midpoint matching at the current Midpoint price.

8.3.3 Order attributes, conditions, restrictions

Midpoint or Midpoint Sweep orders can be entered as Market (M) or Limit (L) orders. The execution conditions IOC and FOK are allowed for both, while BOC is allowed only for Midpoint Sweep orders. IOC and FOK are effective for the Midpoint order book as well as for the CLOB. The BOC condition of Midpoint Sweep orders becomes effective only once the order enters the CLOB. Supported validity constraints for Midpoint and Midpoint Sweep orders are GFD, GTC, and GTD. The following trading capacities are allowed for Midpoint trading: Agency, Riskless Principle, Market Maker, and Proprietary. Midpoint and Midpoint Sweep orders may be persistent or non-persistent.

Auction-related order restrictions such as OAO, IAO, CAO, or AO will result in an error for Midpoint orders but can be entered for Midpoint Sweep orders for which they will be without effect in the Midpoint order book. For Midpoint Sweep orders such order restrictions come into effect only once they enter the CLOB.

Limit prices of Midpoint orders (not: Midpoint Sweep orders) may be of the granularity of the T7 tick size, to which the Midpoint price will be rounded, i.e., a Midpoint order limit price may be more granular than the ESMA tick size.

The BBO flag for Midpoint and Midpoint Sweep orders will always be False. In case the Midpoint Sweep order is transferred to the CLOB, the regular BBO flagging processing will be applied.

The passive/aggressive indicator for Midpoint trades will be set according to the known rules. If two sitting Midpoint orders match due to a move of the Midpoint, both will be marked as 'passive'. For order execution messages, the passive / aggressive indicator (Fill Liquidity Indicator) will show new valid values for Midpoint orders, either 'added' (passive) or 'removed' (active) liquidity to/from the Midpoint order book.

8.3.4 Specific Midpoint Order Trading Restrictions MBO and CRT

Midpoint orders may be entered with one or two of the following trading restrictions:

- Midpoint-Book-Only (MBO)
- Counterparty-Resting-Time (CRT)

8.3.4.1 Midpoint-Book-Only (MBO)

A Midpoint order with trading restriction MBO does not participate in any immediate midpoint matching upon entry, whether full or partial. Instead, it is entered into the Xetra Midpoint order book entirely passively. The order may then participate in subsequent midpoint matches, when it can be passively executed.

Midpoint orders with trading restriction MBO cannot be Midpoint Sweep orders, i.e., they will always stay in the Midpoint order book and will never enter the Central Limit Order Book (CLOB).

MBO orders cannot be modified to or from any other trading restriction. They cannot be combined with execution conditions IOC or FOK.

8.3.4.2 Counterparty-Resting-Time (CRT)

A Midpoint Order with trading restriction CRT is executed only against counterparty Midpoint orders, which have been passively resting in the Xetra Midpoint order book for at least a predefined minimum resting time period in *Continuous* trading as well as in a marketable state without interruption regardless of the sitting orders' trading restrictions.

A Midpoint order is in a marketable state, as long as it is a Market order, or, if it is a Limit order, its price is eligible for midpoint execution, i.e., its price is within the volatility boundaries and its price allows an execution at the current Midpoint price.

The predefined minimum resting time period of a Midpoint order in the Xetra Midpoint order book is called *Minimum Marketable Resting Time*, abbreviated as MMRT, and is defined by the exchange. It can be set to 0. The MMRT is defined and communicated to the participants via Circular (Trading Parameters).

There are various reasons why the accumulated resting time period counting for Midpoint orders can be interrupted, thus the accumulation of the resting time period starts again with 0:

- When the trading state *Continuous* is interrupted.
- When the current Midpoint order is no longer marketable at the price (due to Midpoint price movement or due to Midpoint order price modification).
- When the current Midpoint price changes and moves out of the current volatility boundaries or no BBO is available in the CLOB.
- When Midpoint trading is halted by Xetra.

The matching of eligible resting orders starts on the side with the higher open quantity of eligible resting orders, and if both sides have equal open quantity, it starts with the buy side.

8.3.5 Order Modification

The change of an order of type Midpoint into an order of any other type, and vice versa, will not be allowed. In addition, it will not be allowed to change a Midpoint order into a Midpoint Sweep order, and vice versa.

The following modifications result in a new timestamp on order modification:

- Changing the limit of a Midpoint or Midpoint Sweep order
- Increasing the quantity of a Midpoint or Midpoint Sweep order

- Increasing or decreasing the Minimum Acceptable Quantity of a Midpoint order, see next subchapter.

8.3.6 Minimum Acceptable Quantity

Traders may set a Minimum Acceptable Quantity (MAQ) for each Midpoint order individually. The MAQ ensures that Midpoint orders match only against other sitting or incoming orders in the Midpoint order book which have, in sum, a quantity greater or equal to the MAQ.

A MAQ cannot be entered for Midpoint Sweep orders. The MAQ must be equal to or a multiple of the minimum tradable unit. The MAQ has to be smaller than or equal to the order quantity available for executions. As soon as the remaining quantity of a Midpoint order falls below its MAQ after a partial Midpoint execution, the MAQ is reduced to the remaining quantity.

8.3.7 Validations

Midpoint and Midpoint Sweep orders will be subject to all usual validations known for Regular orders, such as Maximum Order Value (MOV), Maximum Order Quantity (MOQ), Price Reasonability Check (PRC), or Pre-Trade Risk Limits.

Midpoint and Midpoint Sweep orders will have to comply with all the above-mentioned order conditions and restrictions, including validity and the MAQ, to take part in the volume-time priority matching of the Midpoint order book.

Midpoint and Midpoint Sweep orders will be subject to the existing MiFID validations as Regular orders. Therefore, all the MiFID relevant attributes will be applicable also for Midpoint and Midpoint Sweep orders.

Any midpoint order entered with a liquidity provision flag will be accepted by the T7 system but the sponsoring of instruments by Designated Sponsors and Regulated Market Makers will take place in the CLOB only, not in the Midpoint order book.

It will be possible to enter Midpoint Sweep orders even if Midpoint trading is switched off. In this case, the Midpoint Sweep orders will enter the CLOB directly.

8.3.8 Midpoint Self-Cross Prevention

Every Midpoint order can be entered with an SMP ID (Cross ID) in the T7 system. For Midpoint matching, the SMP ID will be taken into account to avoid orders with the same SMP ID matching each other, i.e., to achieve a Midpoint Self-Cross Prevention. All sitting Midpoint orders in the Midpoint order book will be checked for the SMP ID and once they are crossed with other orders of the same SMP ID, they will be cancelled.

For Midpoint Sweep orders, once they reach the CLOB, the SMP ID will be used for the existing Self-Match Prevention.

9. Off-book Trading

This chapter discusses the off-book trading functionality of T7. Off-book trading on T7 is also referred to as T7 Entry Services (TES). The two terms off-book and TES are applied interchangeably in this document.

Set Up Information:

Off-book trading is currently provided for Eurex, Xetra, Frankfurt, BSE, MSE, and WBAG with its partner exchanges, as well as for EEX.

Currently, off-book trading on T7 is not supported for Nodal.

9.1 TES Trade Characteristics

This chapter describes the characteristics of a TES trade.

9.1.1 TES activities and roles

The activities which are available to the users are:

- Enter a TES trade.
- Modify a TES trade.
- Delete a TES trade.
- Approve a TES trade side.

Roles are defined by grouping of the above activities, and of supervisor and view rights. The following roles are at the core of TES trading:

- **TES trader** – A TES trader must be involved in the TES trade as one of the counter parties. A user who is assigned the TES trader role can enter a TES trade as an initiating user and then modify or delete that TES trade. A TES trader can act as an approving user and can approve the respective TES side.
- **TES broker** – A TES broker is not involved in the TES trade as a counter party. A user who is assigned TES broker role can enter a TES trade as an initiating user and then modify or delete that TES trade but is not allowed to act as approving user and approve a TES trade.

For more details on roles see the *Derivatives resp. T7 Participant and User Maintenance Manual for Cash markets*. Please find the document as described in section 1.2 Usage Notes.

9.1.2 Bilateral and Multilateral TES Trades

A *bilateral TES trade* is an off-book trade executed between exactly one buyer and one seller implying two approving users.

A *multilateral TES trade* is an off-book trade executed between one or several buyers against one or several sellers implying more than two approving users.

The sum of the trade volume of all buyers is always equal to the sum of the trade volume of all sellers.

The *T7 Trade Entry* generally applies to bilateral and multilateral TES trades. The number of sides

allowed for a TES trade is defined as *Max Participants* in the TES profile (see chapter 9.4). If *Max Participants* is defined as two then only a bilateral TES trade with one buy and one sell side is allowed for the corresponding Product-Instrument type and TES type combination.

The approving user of the same business unit may have more than one side in the same TES trade (several buy or several sell sides in case of multilateral TES trades). The sequence of the buy and the sell sides has no importance and is not validated.

From an approving user perspective, a TES trade is always seen as a bilateral trade with the initiating user as its counterpart. The clearing information of an approving user is not communicated to the other approving users as well as to the initiating user involved in the same TES trade.

9.1.3 TES Trade and TES Side Identifiers

On each TES trade entry, the following identifiers are generated by T7 automatically:

- **TES Trade identifier (*TES Id*)** – When a trader or a broker has successfully entered a new TES trade in T7, the system assigns a unique TES trade identifier (*TES Id*) to the newly entered and pending TES trade. The *TES Id* is communicated to the initiating user and to all approving users via the TES broadcast. The initiating user is able to identify the TES trade using the *TES Id* in order to delete or modify the TES trade.
- **TES Side identifier (*TES Side Id*)** – When a new TES trade was successfully entered in T7, the system assigns to each side of the TES trade a TES side identifier (*TES Side Id*). The *TES Side Id* is communicated to the corresponding approving user via TES broadcast.

In order to approve a TES side, the approving user has to specify the *TES Id* and *TES Side Id*. Both identifiers are guaranteed to be unique per product resp. cash instrument and business day.

9.1.4 TES Trade Price

The TES trade price must be provided by the initiating user when entering a TES trade. Depending on the TES type, there is a price validation according to an exchange-defined price range⁹, or no price validation at all (OTC for cash). If the price is outside of a required price range, then the TES trade is rejected with a corresponding error message.

Apart from being in the expected price range the price provided in each TES trade is validated to be in accordance with the TES price step table of the relevant instrument. Please note that the TES price step table of an instrument may be different to the *on book* price step table. A price step table defines price intervals and the size of the price step for each price interval. Inside each price interval, valid TES prices are those that can be obtained by adding an integer multiple of the price step to the lower end of the price interval. Price steps are always integer multiples of the tick size, and therefore, valid TES prices are always integer multiples of the tick size however not every multiple of the tick size is a valid TES price.

The price of the TES trade entered by the initiating user is also communicated to the approving user in the TES broadcast along with the *TES Id* and *TES Side Id*. The TES trade price can be changed only by the initiating user and then the TES trade needs to be again approved by all the approving users.

⁹ For Eurex cf. e.g. *Conditions for Trading at Eurex Deutschland*, in: www.eurex.com > Rules & Regs > Eurex Rules & Regulations : Trading Conditions.

The approving user cannot change the TES trade price.

9.1.5 User Provided Leg Trade Prices

When entering a TES trade for complex instruments, depending on the relevant TES profile, it is possible for a user to provide the leg trade prices. T7 then applies these user-provided leg trade prices for the TES deals in the leg instruments, rather than calculating them itself.

Similar to the TES trade price, each user provided leg trade price is validated to be within the boundary price of the leg instrument.

As for the TES trade price, leg trade prices can only be modified by the initiating user. It is also possible to modify a TES trade from one without predefined leg trade prices to one with predefined leg trade prices or vice-versa. A change in a leg trade price is treated as a substantial modification, similar to the TES trade price modification, and requires again an approval from all approvers of the TES trade.

9.1.6 TES Side Quantity

The initiating user must provide the quantity for each buy and sell side of the TES trade. The accumulated quantity of the buy sides must be equal to the accumulated quantity of the sell sides. The quantity on each buy as well as sell side should be at least equal to the *Minimum Lot Size* defined in the applicable TES profile. For a TES trade in Options Volatility Strategy the side quantity multiplied by the **options multiplier** must be greater than or equal to the *Minimum Lot Size*.

Depending on configuration, in unilateral (1:n) TES trades, the multiple quantities are considered aggregated so that not each single trade side has to meet the *Minimum Lot Size*, but that only the sum of all quantities of this side has to meet the *Minimum Lot Size*.

Depending on the TES type, there are the following quantity validations for each approving trade side or no such validations at all.

TES quantity validations	Cash TES types		Derivatives TES types
	LIS / Xetra EnLight	OTC	
Maximum Order Value	✓		
Maximum Order Quantity	✓		
Large In Scale Value	✓		
Transaction Size Limits			✓
Minimum Lot Size			✓

Quantity validations for derivatives TES types:

- **Transaction Size Limits**¹⁰ – The side quantity is validated against the approving user's *Transaction Size Limits* for TES. For a TES trade in a complex instrument, the leg quantity multiplied by the leg ratio must be less than or equal to the approving user's *Transaction Size Limits* for TES. The side quantity is also validated against the Transaction Size Limits for TES defined by the exchange.
- **Minimum Lot Size** – The side quantity is validated against the minimum lot size.

Quantity validations for TES type LIS:

- **Maximum Order Value** – On entry, the TES price multiplied with the TES trade quantity has to be lower or equal to the Maximum Order Value given on the user level as well as compared to the Maximum Order Value defined by the exchange. If the validation fails, then the TES trade approval is rejected for the corresponding approving user.
- **Maximum Order Quantity** – The pre-defined Maximum Order Quantity on the user level has to be higher or at maximum equal to the TES trade quantity. The same is true for the maximum order quantity limit defined by the exchange.
- **Large in Scale Value** – On TES entry, TES trade price multiplied by the (side) quantity (and multiplied with the *pool factor*, if defined for certain bonds) has to be at least equal to or higher than the Large in Scale Value. Depending on the difference to this value, the delay for the TES trade disclosure is determined.

For each side of the TES trade the side quantity entered by the initiating user is also communicated to the approving user in the corresponding TES broadcast along with the *TES Id* and *TES Side Id*. The side quantity can only be changed by the initiating user. If a side quantity is changed by the initiating user, then each approving user who is part of the TES trade needs to again approve their TES trade side. The approving user cannot change the TES side quantity.

9.1.7 TES Trade Publication and Non-Disclosure Limits

For derivatives: Price and quantity of a TES trade successfully ratified on T7 are published in real time via market data. Bilateral TES trades for which the TES side quantity exceeds the configured Non-Disclosure Limit in the corresponding TES profile, the initiating user is able to specify that the TES trade shall not be published in real time to the market. The non-disclosed trade is shown in the report TE910 and on the next day on the Trader GUI.

For cash: TES trades of TES type LIS are published via market data. TES trades of TES type OTC are not published.

¹⁰ Please note that under MiFID perspective the validation for Transactions Size Limits for derivatives is equivalent to the validation of the Maximum Order Quantity.

9.1.8 Segment MIC

For cash instruments on the T7 trading venues Deutsche Börse Xetra and Deutsche Börse Frankfurt, different segment MIC codes are provided for off-book and on-book trades.

- For on-book trades there are the following segment MIC codes on the trading venue Xetra:
 - XETA (Xetra – Regulierter Markt).
 - XETB (Xetra – Freiverkehr).
 - XETS (Xetra – Scale).
- For TES trades with on-exchange TES trade types LIS, the segment MIC codes for the trading venue Xetra are:
 - XETU (Xetra – Regulierter Markt – Off-book).
 - XETV (Xetra – Freiverkehr – Off-book).
 - XETW (Xetra – Scale – Off-Book).
- For Midpoint trades there are the following segment MIC codes on the trading venue Xetra:
 - XEMA – Xetra Midpoint Regulated Market
 - XEMB – Xetra Midpoint Open Market
 - XEMI – Xetra Midpoint Scale
- For on-book trades there are the following segment MIC codes on the trading venue Frankfurt:
 - FRAA (Frankfurt – Regulierter Markt).
 - FRAB (Frankfurt – Freiverkehr).
 - FRAS (Frankfurt – Scale).
- For TES trades with on-exchange TES trade types LIS, the segment MIC codes for the trading venue Frankfurt are:
 - FRAU (Frankfurt – Regulierter Markt – Off-book).
 - FRAV (Frankfurt – Freiverkehr – Off-book).
 - FRAW (Frankfurt – Scale – Off-Book).

For TES trades with off-exchange TES trade type *OTC*, the segment MIC code generally is:

- *XOFF*.

9.1.9 Trade Description

The free text field TES trade description can be entered by the initiating user and are communicated to all the approving users in the TES broadcast. The approving users are not able to modify the TES trade description.

9.1.10 TES Time of Commencement, Entry and Approval Time

The following times are relevant in the context of a TES trade entry and approval in T7.

Time of Commencement

The Time of Commencement is the actual time when the off-book trade has been agreed outside T7, before the physical entry of the TES trade in T7 takes place. The Time of Commencement has to be specified by the initiating user and is applicable to all the TES sides of the TES trade. Depending on configuration by the exchange, the entry of the Time of Commencement is optional. However, in any case, it is strongly recommended for the initiating user to include the correct Time of Commencement, to minimize the likelihood of inquiries by the Trading Surveillance Office.

The Time of Commencement must be earlier than the TES entry time, but not older than one day.

After a successful entry of a TES trade, the Time of Commencement is visible to all approving users involved in the TES trade. Since the Time of Commencement cannot be modified by the approving user, the approval of a TES trade always implies that the Time of Commencement is accepted by the approving user. In case approving users disagree with the Time of Commencement entered, they should not approve the TES trade implying that the TES trade is never ratified.

TES Entry Time

When a TES trade is entered on T7 it is assigned TES entry time. The TES entry time applies to all approving users of TES trade.

Side Approval Time

Whenever a side of the TES trade is approved by the approving user then that time of approval is recorded as the side approval time for the corresponding side.

9.1.11 Other Attributes

Several TES attributes, which need to be filled by the approving trader, either as mandatory or optional fields, are not directly relevant to TES trading but serve other purposes, e.g. in the post-trade processing, or to satisfy regulatory requirements. These are:

- The *Trading Capacity* is a mandatory attribute which contains the trading business type (*Agency, Proprietary, Market making, Riskless Principal*).
- Clearing-related attributes.
- Clearing Account.
- Take-Up Member (derivatives only).
- Open-Close Indicator (derivatives only).
- Free format text fields.
- MiFID II related attributes like *Client ID*, *Execution ID* (short code for a natural person or Algo ID) and *Execution Qualifier* covering the ESMA field "execution within firm", *Investment ID* (short code for a natural person or Algo ID) and *Investment Qualifier* covering the ESMA field "investment decision within firm", and *Liquidity Provision Activity*.
- A *Compliance Information*, attribute for use by the regulatory authority.
- A *Country Code*, indicating the real origin of the approving trader (derivatives only).
- A *Rate Identifier*, to be filled according to FIA guidelines (derivatives only).
- A *Trade Publish Indicator*. Indicates if a trade should be or has been published immediately via market data.

- An optional *End Client Disclosure* field for the voluntary Buy-Side Trading Disclosure. Either the 5-characters Buy-Side Client ID or the client's 20-character Legal Entity Identifier LEI. The exchange decides for which products it can be used.

[Set Up Information:](#)

[Only Eurex is using it.](#)

More information about the handling of clearing related attributes, or of free format text fields, is provided later in the chapter dedicated to the TES requests.

9.2 TES Trade Maintenance

9.2.1 TES Trade Entry and Approval

After a TES trade entry by the initiating user the status of all its sides is set to *Pending* including the TES trade side owned by the initiating user.

A Bilateral TES Trade is entered by the Buyer A as Initiating User						
TES Id	TES Side Id	User Character	Role	User Name	Activity	Side Status
1		Initiating User	TES Trader	Buyer A		
1	1	Approving User	TES Trader	Buyer A	ENTER	Pending
1	2	Approving User	TES Trader	Seller B	ENTER	Pending

or

A Bilateral TES Trade is entered by the Seller B as Initiating User						
TES Id	TES Side Id	User Character	Role	User Name	Activity	Side Status
1		Initiating User	TES Trader	Seller B		
1	1	Approving User	TES Trader	Seller B	ENTER	Pending
1	2	Approving User	TES Trader	Buyer A	ENTER	Pending

or

A Bilateral TES Trade is entered by the Broker C as Initiating User						
TES Id	TES Side Id	User Character	Role	User Name	Activity	Side Status
1		Initiating User	TES Broker	Broker C		
1	1	Approving User	TES Trader	Buyer A	ENTER	Pending
1	2	Approving User	TES Trader	Seller B	ENTER	Pending

During the approval of its TES trade side, the approving user has to complete its own clearing info which includes the attributes described above in chapter 9.1.11. Once a side is approved by the approving user the status of that side is set to *Approved* and marked with the *side approval time*. The approval can be done independently by each approving user. There is no check on the sequence of approval. An approved side can be approved again by the approving user in order to modify the clearing attributes. The second approval of the approving user does not update the status as well as the *side approval time*.

The Bilateral TES Trade is approved first by the Approving User Buyer A who is also the Initiating						
TES Id	TES Side Id	User Character	Role	User Name	Activity	Side Status
1		Initiating User	TES Trader	Buyer A		
1	1	Approving User	TES Trader	Buyer A	APPROVE	Approved
1	2	Approving User	TES Trader	Seller B		Pending

or

The Bilateral TES Trade is approved first by the Approving User Seller B						
TES Id	TES Side Id	User Character	Role	User Name	Activity	Side Status
1		Initiating User	TES Trader	Buyer A		
1	1	Approving User	TES Trader	Buyer A		Pending
1	2	Approving User	TES Trader	Seller B	APPROVE	Approved

When the last remaining side is approved by the corresponding approver the status of the TES trade is immediately ratified afterwards, i.e., the status of all sides is changed to *Executed*.

The Bilateral TES Trade is finally approved by the Approving User Seller B						
TES Id	TES Side Id	User Character	Role	User Name	Activity	Side Status
1		Initiating User	TES Trader	Buyer A		
1	1	Approving User	TES Trader	Buyer A		Approved
1	2	Approving User	TES Trader	Seller B	APPROVE	Approved
1	1	Approving User	TES Trader	Buyer A	EXECUTE	Executed
1	2	Approving User	TES Trader	Seller B	EXECUTE	Executed

Once fully approved (i.e., all sides are executed), the ratified TES trade is sent to the clearing system and each side receives a legally binding *trade notification* which confirms the conclusion of the TES trade. For TES trades in complex instruments, a trade notification is sent for each leg. A TES trade cannot be modified or approved again once the status of the sides is changed to *Executed* and a trade notification was sent out.

9.2.2 TES Trade Modification

The initiating user can modify the TES trade details as long as the trade has not been ratified, and the status of sides has not been changed to *Executed*. All the TES trade attributes, including price, quantity and TES sides, can be modified except the traded instrument and the related references (i.e., cash basket, index, swaps or bonds). Modification of any TES attribute apart from TES description is treated like a new TES trade entry. As a result, the *TES entry time* as well as the *side approval time* is reset, and the status of all sides is changed to *Pending*, but the TES trade identifier remains the same. Each of the approving users is notified about the modification even if they have already approved their side. During TES trade modification all the attributes are validated again as it is done for the *TES trade entry*.

- Modification of *TES trade price*, *time of commencement* and *TES publication status* – Each side is informed about the modification and is required to fill (or refill) the clearing information and perform the approval again. The corresponding *TES side id* is kept.
- Modification of TES side quantity – When the quantity of at least two TES sides is changed then the corresponding sides are informed about the modification along with the updated quantity and updated *TES entry time*. The sides for which quantity have not changed are also informed that the TES trade has been modified by the initiating user with updated *TES entry time*. Each side is required to fill (or refill) the clearing information and perform the approval again. The corresponding *TES side id* is kept.
- Modification of TES sides by adding or deleting a TES side of the TES trade – When the initiating user is submitting a TES trade modification request with the original *TES side ids*, the involved traders keep their *TES side id*. If the initiating user is submitting a TES trade modification request where the *TES side id* is not included, then the corresponding side is considered as a newly entered side and receives a new *TES side id*. When an original *TES side id* is not sent back with the modify request, the corresponding side is deleted. For all sides, the approving time, the clearing information and the approving status are reset to *Pending* irrespectively of the previous approval status. All approving users are then informed by a TES broadcast that they have to approve again their side(s) and to fill (or refill) their clearing information.

A Bilateral TES Trade is entered by the Buyer A as Initiating User						
TES Id	TES Side Id	User Character	Role	User Name	Activity	Side Status
1		Initiating User	TES Trader	Buyer A		
1	1	Approving User	TES Trader	Buyer A	ENTER	Pending
1	2	Approving User	TES Trader	Seller B	ENTER	Pending

The Bilateral TES Trade is approved first by the Approving User Seller B						
TES Id	TES Side Id	User Character	Role	User Name	Activity	Side Status
1		Initiating User	TES Trader	Buyer A		
1	2	Approving User	TES Trader	Seller B	APPROVE	Approved
1	1	Approving User	TES Trader	Buyer A		Pending

The above Bilateral TES Trade is modified by the Initiating User A by Entering Seller as C and removing Seller B						
TES Id	TES Side Id	User Character	Role	User Name	Activity	Side Status
1		Initiating User	TES Trader	Buyer A		
1	1	Approving User	TES Trader	Buyer A	MODIFY	Pending
1	2	Approving User	TES Trader	Seller B	DELETE	Deleted
1	2	Approving User	TES Trader	Seller C	ENTER	Pending

Afterwards,

The above Bilateral TES Trade is again modified by the Initiating User A by Adding Buyer D						
TES Id	TES Side Id	User Character	Role	User Name	Activity	Side Status
1		Initiating User	TES Trader	Buyer A		
1	1	Approving User	TES Trader	Buyer A	MODIFY	Pending
1	2	Approving User	TES Trader	Seller C	MODIFY	Pending
1	3	Approving User	TES Trader	Buyer D	ENTER	Pending

9.2.3 TES Trade Deletion

The initiating user can delete the TES trade as long as the trade has not been ratified and the status of sides has not been changed to *Executed*. When one or several sides have been already approved, as long as there is still one pending side, the TES trade can be deleted. The initiating user and all approving users, independently of their previous side status (pending or approved), are informed of the TES Deletion by a TES broadcast.

A Bilateral TES Trade is deleted by the Broker C as Initiating User						
TES Id	TES Side Id	User Character	Role	User Name	Activity	Side Status
1		Initiating User	TES Broker	Broker C		
1	1	Approving User	TES Trader	Buyer A	DELETE	Deleted
1	2	Approving User	TES Trader	Seller B	DELETE	Deleted

A multilateral TES Trade is deleted by the Buyer A as Initiating User						
TES Id	TES Side Id	User Character	Role	User Name	Activity	Side Status
1		Initiating User	TES Trader	Buyer A		
1	1	Approving User	TES Trader	Buyer A	DELETE	Deleted
1	2	Approving User	TES Trader	Seller B	DELETE	Deleted
1	2	Approving User	TES Trader	Seller B	DELETE	Deleted

9.2.4 Auto Approval functionality

The auto approval functionality allows the participants to approve TES trades automatically according to criteria pre-defined in TES Auto Approval Rules, and to provide pre-defined clearing and MiFID fields as part of the TES Auto Approval Rule.

When the TES profile allows Auto Approval and TES Auto Approval Rules are provided in the system, then the side of the approving user is checked as to whether the required conditions are fulfilled and if so, then it is automatically approved.

The pre-defined values from the TES Auto Approval Rules are automatically applied. Yet fields which are prefilled by the initiating user for the approving user are not overwritten with the values provided by the TES Auto Approval Rule.

When all sides of the entered TES trade are auto approved, then the TES Trade is ratified upon entry and all sides are immediately executed. The side status of an auto approved side is *Auto Approved* in order to distinguish it from a side approved directly by the approving trader which has the status *Approved*.

9.2.4.1 The TES Auto Approval Rules

The TES Auto Approves Rules are defined and maintained by the service administrator user in the T7 Admin GUI for the (approving) users in the corresponding business unit. Intraday changes become effective immediately.

A TES Auto Approval Rule consists of three parts:

- Unique name of the rule.
- Selection key.
- Pre-filled approval fields.

The selection key consists of:

- Mandatory fields: Initiating user, approving user, market group, i.e., either Product Assignment Group or the whole market identifier.
- Optional fields: Product, TES type, instrument type, Enrichment rule. If optional fields are provided, the rule has a higher priority than a rule without the field. – It is possible to apply a rule on TES trades involving selected clients by filling the Enrichment Key of the rule with a freely chosen client-specific key.

The approval fields consist of:

- Clearing & MiFID fields: These reflect the predefined fillings of clearing and MiFID fields as part of the TES Approval request. There are mandatory and optional fields. On setting up an Approval Rule, certain validations are performed such as validating that the Client Identifier must be provided if the Trading Capacity is Agency.
- Additional Criteria: Maximum Trade Quantity as an upper limit above which no automatic approval takes place.

9.2.4.2 Application of TES Auto Approval Rules

If the TES profile allows auto approval, then on each TES trade entry/modification/upload request, for each trade side, the following algorithm is executed step-by-step to find the applicable TES Auto Approval Rule:

Step 1: Check whether the approving user has TES Auto Approval Rules defined for the Initiating User:

- a. If no rules are found, then no TES Auto Approval Rule can be applied, and the request is processed further for manual approval.
- b. If one or multiple rules are found, then continue with Step 2 using these rules.

Step 2: Product Assignment ID is used to further restrict the selection criteria. The rules with Product Assignment group of the product have priority over the market wide group.

- a. If no rules are found with the Product Assignment ID for the product provided in the TES trade entry/modification/upload request, then take all the rules with market wide group and continue with Step 3.
- b. If one or multiple rules are found, then continue with Step 3 using these rules.
- c. If no rules are found with market wide group, then no TES Auto Approval Rule can be applied, and the request is processed further for manual approval.

Step 3: Product ID is used further to restrict the selection criteria:

- a. If no rules are found with the Product ID provided in the TES trade entry/modification/upload request, then take all the rules without Product ID and continue with Step 4.
- b. If one or multiple rules are found, then continue with Step 4 using these rules.
- c. If no rules are found without Product ID, then no TES Auto Approval Rule can be applied, and the request is processed further for manual approval.

Step 4: TES Type is used further to restrict the selection criteria:

- a. If no rules are found with the TES Type provided in the TES trade entry/modification/upload request, then take all the rules without TES Type and continue with Step 5.
- b. If one or multiple rules are found, then continue with Step 5 using these rules.
- c. If no rules are found without TES Type, then no TES Auto Approval Rule can be applied, and the request is processed further for manual approval.

Step 5: Instrument Type is used further to restrict the selection criteria:

- a. If no rules are found with the Instrument Type provided in the TES trade entry/modification/ upload request, then take all the rules without Instrument Type and continue with Step 6.
- b. If one or multiple rules are found, then continue with Step 6 using these rules.
- c. If no rules are found without Instrument Type, then no TES Auto Approval Rule can be applied, and the request is processed further for manual approval.

Step 6: Enrichment Rule ID is used further to restrict the selection criteria:

- a. If the Enrichment Rule ID is not filled in the TES trade entry/modification/upload request or no matching rules are found with the provided value, then the rule without Enrichment Rule ID is used for further processing of auto approval.
- b. If there is no such rule with the Enrichment Rule ID not filled, then no TES Auto Approval Rule can be applied, and the request is processed further for manual approval.
- c. If one rule is found with the Enrichment Rule ID provided in the TES trade entry/modification/ upload request, then that rule is used for the further processing of auto approval.

9.2.4.3 Approval result messaging

In case of a successful TES trade side approval performed on the basis of a TES Auto Approval Rule, the approver is informed about the Approval Rule and its successful application via broadcast.

In case the TES trade side approval performed on the basis of a TES Auto Approval Rule fails due to a validation, the error message is conveyed to the approving user via broadcast.

9.2.5 Safeguards

Find detailed information about safeguards of all kinds in chapter 14.

9.3 TES Types

9.3.1 Overview

For derivatives markets, the T7 Entry Service supports the following TES types:

- Block Trade Service – Supports the multilateral and bilateral, off-book trading of derivative products. Buyers and sellers can enter the trades that they previously arranged with each other into the T7 system.
- Exchange for Physicals (EFP) Fin – Supports bilateral off-book trading on futures products and a cash reference to specific bonds.
- Exchange for Physicals (EFP) Index – Supports bilateral off-book trading on futures products and a cash reference to an equity basket.
- Exchange for Swaps (EFS) – Supports bilateral off-book trading on futures products and a cash reference to a swap contract.
- Vola Trade Service – Supports bilateral off-book trading on futures products and a reference to an options off-book trade (Block TES trade, including block traded flexible options, or Eurex EnLight trade if not negotiated anonymously). On-exchange options trades are not allowed to be used as a reference for a Vola trade.
- Trade at Market – Specific TES type for Total Return Futures products.
- Eurex EnLight – A trade based on a previous Eurex EnLight Deal results in the TES Type Eurex EnLight.
- Qualified Third-Party Information Provider trade (QTPIP) – Third party information providers (they are no Eurex exchange participants) that have been categorized by Eurex as QTPIPs are allowed to perform off-book entries on behalf of Eurex exchange participants to the Eurex

T7 trading platform using the QTPIP TES type. All Eurex participants are in general able to approve such QTPIP entries which then result in QTPIP off-book trades. The third-party information providers themselves are not able to approve QTPIP trades.

For cash instruments, the T7 Entry Service supports the following TES types:

- **OTC – Over-the-Counter:** Supports the bilateral, off-exchange trading of cash instruments. Buyer and seller can enter the trades that they previously arranged with each other into the T7 system. Neither price nor quantity validations nor publication of the TES trade is performed.
- **LIS – Large-in-Scale:** Supports the bilateral, off-book but on exchange trading of cash instruments. Buyer and seller can enter the trades that they previously arranged with each other into the T7 system. On entry, several validations are conducted, e.g. price and quantity validations. After approval, the TES trade is published with a certain delay via market data. The deferred TES trade publication is performed according to MiFID/MiFIR requirements.
- **Xetra EnLight –** A trade resulting from a Xetra EnLight transaction results in the TES Type Xetra EnLight. The TES trade is published with a certain delay via market data. The deferred TES trade publication is performed according to MiFID/MiFIR requirements.

The TES type eligibility defines if TES trading in one or more of the above-mentioned TES types is allowed on business unit and user level. The TES type eligibility of “Block Trade” does automatically include the TES type eligibility of “Trade at Market”.

[Configuration Data:](#)

TES trades in general have a maximum of 30 counterparties.

9.3.2 TES types for derivatives markets

9.3.2.1 Block Trade Service

The Block Trade Service can be used to enter off-book trades on Simple Instruments, Complex Instruments and Flexible Instruments.

Based on the TES profile (chapter 9.4), the block trade can be a bilateral off-book trade i.e., involving two counter parties or a multilateral trade involving more than two counterparties and whether a block trade can be entered by a TES trader or a TES broker.

9.3.2.2 Exchange for Physicals (EFP) Fin

An EFPF Trade (Exchange for Physicals for Financial Futures) is used to enter an off-book trade for a futures contract against a previously executed Admitted EFPF Reference. See the Eurex website for more information about Admitted EFPF References. The Admitted EFPF Reference trade is reported without creating a position.

An EFPF trade has, apart from the characteristics described in chapter 9.1, the following fields for entering the corresponding Admitted EFPF Reference, used as part of the trade:

- *ISIN* (mandatory), Identification of the Admitted EFPF Reference.
- *Nominal* (mandatory), nominal value of the Admitted EFPF Reference.
- *Issuer Security Name*, optional text with the issuer or the name of the Admitted EFPF Reference.
- *Cash Price* (optional), price of the transaction of the Admitted EFPF Reference (in case of several expirations of financial futures as Admitted EFPF Reference: average price).

- *Coupon* (optional), value of the coupon in case of a bond as Admitted EFPI Reference.
- *Coupon Frequency* (optional), frequency of the coupon payment in case of a bond as Admitted EFPI Reference.
- *Settlement Date* (optional) of the transaction in case of a bond as Admitted EFPI Reference. When a settlement date is specified, it cannot be earlier than the current business date.
- *Maturity Date* (mandatory), maturity date or contract date respectively, of Admitted EFPI Reference; in case of Short Term Interest Rate Futures contract date with longest term.
- *Currency* (optional), Currency code of the Admitted EFPI Reference.
- The *Hedging Method* (mandatory) must be specified with a valid value:
 - DUR – Duration hedge,
 - PF – Price Factor hedge,
 - NOM –Nominal hedge.
- The *Settlement Institution* is an optional field which can be filled with the following clearing systems:
 - BC – Clearstream Banking Frankfurt,
 - CD – Clearstream Banking Luxembourg,
 - CS – CLS,
 - EC – Euroclear.

9.3.2.3 Exchange for Physicals for Index (EFPI)

An EFPI Trade (Exchange for Physicals for Index) is used to enter an off-book trade for an index futures contract or FX futures contract against an Admitted EFPI Reference. Also Flexible instruments are allowed. See the Eurex website for more information about Admitted EFPI References.

For EFPI Trades, apart from the characteristics described in chapter 9.1 the following references can be entered for the corresponding Admitted EFPI Reference, used as part of the trade:

- *Reference ID* (mandatory) of the Admitted EFPI Reference.
- *Nominal* (mandatory) value of the Admitted EFPI Reference.
- The *Hedging Method* (mandatory) contains the value *NOM* for Nominal Hedge.
- The *Settlement Institution* is an optional field which can be filled with the following clearing systems:
 - BC – Clearstream Banking Frankfurt,
 - CD – Clearstream Banking Luxembourg,
 - CS – CLS,
 - EC – Euroclear.

Additionally, the EFPI Trade at Index Close service supports the entry of off-book trades in equity index futures based on the combination of the next available index closing price plus basis. In T7 the Trade at Index Close service is realized as EFPI TES trade with the following characteristics:

- The *Reference ID* must be set to "TAIC" indicating that the instrument is traded at Index Close. The first 4 characters may be completed with an optional reference (preceded by "TRAN") to a co-related TES ID in the case of the TES trade being split into several TES trades in order to get a more granular price.
- The *Nominal* value is set to zero.
- The *TES description* (see chapter 9.1.9) must be filled with the relative price (Basis) agreed

upon in relation to the index futures close price entered in basis points.

- The *TES Price* (see chapter 9.1.4) is set by the initiating user to be identical to the Basis specified in the TES description field (see previous bullet) plus the underlying index closing price of the current business day as soon as it is available.
- The field *Text3* should not be prefilled by the users.

9.3.2.4 Exchange for Swaps (EFS)

The EFS Trade (Exchange for Swaps) is used to enter an off-book trade for a futures contract against a previously executed Admitted Reference Swap. See the Eurex website for more information about Admitted Reference Swaps.

For EFS trades, apart from the characteristics described in chapter 9.1, the following references can be entered for the corresponding swap transaction:

- *Nominal* (mandatory) value of the Admitted Reference Swap.
- *Swap Payer* (optional) textual description of the buy customer of the Admitted Reference Swap.
- *Swap Receiver* (optional) textual description of the sell customer of the Admitted Reference Swap.
- *Coupon Frequency* (optional) textual description of the Admitted Reference Swap payments.
- *Fixed Coupon Rate* (optional), textual description of fixed interest rate of the Admitted Reference Swap.
- *Variable Coupon Reference* (optional), text field indicating the reference interest rate used as the variable coupon rate (e.g. LIBOR, EURIBOR).
- *Variable Coupon Offset* (optional), textual description of the variable rate, of the Admitted Reference Swap.
- *Start Date* (mandatory) of the Admitted Reference Swap transaction, The Start Date must not be earlier than the Settlement Date and must be earlier than the End Date.
- *End Date* (mandatory) of the Admitted Reference Swap transaction.
- *Settlement Date* (optional) of the Admitted Reference Swap transaction. The Settlement Date cannot be earlier than the current business date.
- *Currency code* (optional) of the Admitted Reference Swap transaction.
- The *Hedging Method* (mandatory) contains the value DUR for Duration hedge.
- The *Settlement Institution* is an optional field which can be filled with the following clearing systems:
 - BC – Clearstream Banking Frankfurt.
 - CD – Clearstream Banking Luxemburg.
 - CS – CLS.
 - EC – Euroclear.

9.3.2.5 Vola Trade

A Vola Trade (volatility trade) is used to enter an off-book trade for a futures contract against a bilateral option block trade (also flexibles or Eurex EnLight trades possible). The Vola trade executed on the futures contract between the same counterparts is expected to offset the delta of the existing options trade.

The traded futures must be or must have the same underlying as the traded options passed in reference in order to get a Delta Neutral position.

For indexed options, the future contract must have the same underlying as the option contract.

For interest rate options, the future contract must be the underlying of the options contract.

The following references are required for the corresponding options block trade:

- *Options Contract*: Identifier of the traded options.
- *Options Transaction No*: Deal ID of a block trade executed for the options contract on the same business day (resulting trade must not be cancelled).
- *Options Quantity*: Used for the delta neutral hedge against the future quantity must be smaller than the maximum available quantity.

Only bilateral trades (one buyer against one seller) are allowed as reference for Vola Trades. As a consequence, only bilateral TES trades for Vola trades are supported.

The buyer and the seller of the Futures contract for the Vola Trade must be the same users as the buyer and the seller of the Options trade. However, they must have an opposite long/short delta between the options and the futures trades:

- The buyer of the Futures trade (who is delta long) must be the seller of a call option (who is delta short or the buyer of a put option (who is also delta short).
- The seller of the Futures trade (who is delta short) must be the buyer of a call option (who is delta long) or the seller of a put (sell) option (who is also delta long).

The options quantity used must not be greater than the Options Quantity Max, corresponding to the initial trade quantity of the options block trade, decremented by the already used quantities for some previous Vola trade entry referring to the same options block trade.

9.3.2.6 Trade at Market (TAM)

The Trade at Market facility is used to enter an off-book trade on a Total Return Futures or Variance Futures product together with a custom index value. The entered custom index value replaces the generic index value in the trading to clearing price calculation, irrespectively of the preliminary or the final index values (see the Appendix *Total Return Futures: Trade-at-Market* in the *T7 Functional Reference Part 2*). The specified custom index value is validated against a range around the previous day's underlying closing price of the underlying asset. If the specified custom index value is outside this range, the trade entry, modification, amendment, or substitution is rejected. Executed TAM trades are immediately posted as regular block trades and are therefore not reconverted when the final index close value of the day is available.

9.3.2.7 Eurex EnLight

Trades based on a previous Eurex EnLight Deal result in an off-book *on exchange* trade of TES Type

Eurex EnLight. The Negotiation Event to negotiate an Eurex EnLight Deal is initiated by a Request for Quote. For details see chapter 10.3 below.

9.3.3 TES types for cash markets

9.3.3.1 OTC

The TES type OTC supports the bilateral, *off-exchange* trading of cash instruments. Buyer and seller can enter the trades that they previously arranged with each other into the T7 system.

The settlement date can be at least one day after the current business day but not more than T+89 days.

Neither price nor quantity validations nor publication of the TES trade is performed.

Pre-approved bilateral OTC Trade Uploads can be uploaded to T7 as a direct trade reporting without further approvals by any other trading participant/counterparty. The uploaded trades will be reported with the OTC TES Type. Additionally, it will be possible to reverse these pre-approved OTC Trades without further approvals by any other trading participant/counterparty.

[Set Up Information:](#)

Please note that pre-approved bilateral OTC Trade Uploads are only available in the context of the German bilateral stock exchange trading and is different to the OTC TES Trade handling outlined above.

9.3.3.2 LIS

The TES trade of type LIS supports the bilateral, off-book but *on exchange* trading of cash instruments. Buyer and seller can enter the trades that they previously arranged with each other into the T7 system.

The settlement date can be at least one day after the current business day but not more than T+89 days.

On entry, several validations are conducted, e.g. price and quantity validations. After approval, the TES trade is published with a certain delay via market data. The TES trade publication is deferred according to MiFID/MiFIR requirements.

9.3.3.3 Xetra EnLight

Trades based on a previous Xetra EnLight Deal result in an off-book *on exchange* trade of TES Type Xetra EnLight. The Negotiation Event to negotiate a Xetra EnLight Deal is initiated by a Request for Quote. For details see chapter 11.2 below.

9.4 TES Profile

The TES profile enables a configurable mapping between products and their instrument types on the one hand and TES types on the other hand.

9.4.1 TES Profile Key

Each TES profile has a unique key, consisting of a combination of the following values:

- product
- instrument type
- TES type
- minimum expiry range

T7 supports off-book trading only for instruments addressed by such a TES profile key.

9.4.2 Expiry dependent TES Attributes

With the *minimum expiry range* it is possible to define different TES profiles for various ranges of expiries. The *minimum expiry range* indicates the lower border of the expiry range, whereas the upper border (excluded) is defined by the TES profile with the next higher *minimum expiry range*. If there is no TES profile with a next higher *minimum expiry range*, then the TES profile is valid for all expiries equal or higher than its *minimum expiry range*.

Expiry dependent TES Attributes can be defined for simple, complex and futures instruments. For a complex instrument, in case the leg instruments have different expiration dates falling into different expiration time intervals, then the TES Profile with the lowest minimum lot size determines the TES attributes for the complex instrument. For a flexible instrument, the expiry dependent TES attributes are determined by the TES profile record with an Expiry Index whose expiration time interval contains the flexible expiration date of the corresponding simple instrument.

The TES profile attributes which can be varied for different expiry indices are restricted to:

- Minimum Lot size
- Non-disclosure Limits

9.4.3 TES Profile Attributes

For each TES profile key, a set of attributes can be defined in the TES profile. The TES profile attributes for derivatives markets are:

- Broker Allowed – This flag defines whether TES trades can be entered by a broker (initiating user which is not an approving user) or not. See chapter 9.1.1 for details on broker role.
- Max Participants – This field provides information about how many participants / TES approving users can be involved on both sides of a TES trade. If only bilateral trades are allowed, then Max Participants is set to 2. If multilateral trades are also allowed along with bilateral trades, then a value higher than 2 i.e., typically 30 is set.
- Minimum Price Step – This field provides the information about the minimum price increment allowed for a TES trade.
- Minimum Lot Size – This field provides the information about the minimum TES side quantity allowed in a single leg.

- Minimum Lot Size Non Primary (optional) – Replaces Minimum Lot Size for non-flexibles without Primary flag set, if the Minimum Lot Size Non Primary is filled.
- Allow Auto Approval – This field decides whether TES Auto Approval is allowed or not.
- Non-disclosure Limit – This field provides the quantity threshold for using the non-disclosure feature. See chapter 9.1.7 for details on non-disclosure limits.
- Leg Prices Allowed – This field provides the information whether it is allowed to provide trade prices for the leg instruments of a complex instrument or not, and if allowed whether the leg trade prices must always be provided.
- Price Validation Rule – The rule used for price validation of TES trades in accordance with exchange-defined rules¹¹.

The TES profile attributes for cash markets are a subset of the TES profile attributes for derivatives markets:

- Broker Allowed.
- Max Participants. – Always 2 for bilateral.
- Price Validation Rule.

Configuration Data:

The TES profile for Eurex, Xetra resp. Frankfurt is published on the Web sites mentioned in section 1.2 (Usage Notes).

Example 9-1:

The TES profile for a derivatives market in the table below for the combination FDAX –Simple – Block provides e.g. the following information:

- *Block TES trades are allowed for simple instruments in FDAX*
- *Block TES trade entry by a Broker is not allowed for simple instruments in FDAX.*
- *Only bilateral Block TES trades are allowed for simple instruments in FDAX*
- *All Block TES trades in FDAX simple instruments are disclosed, i.e., price and quantity are disclosed in the public market data.*
- *There are no legs as it is a simple instrument and separate Leg Prices are not allowed.*
- *A price validation rule FUTURE SIMPLE INSTRUMENT is used.*

¹¹ For Eurex cf. e.g. *Conditions for Trading at Eurex Deutschland*, in: www.eurex.com > Rules & Regs > Rules & Regulations : Trading Conditions.

TES Profile: Example for derivatives market												
Key				Attributes								
Product	Instrument Type	TES Type	Min Expiry Range	Broker Allowed	Max Participants	Minimum Price Step	Minimum Lot Size	Minimum Lot Size Non Primary	Allow Auto Approval	Non-disclosure Limit	Leg Prices Allowed	Price Validation Rule
FDAX	Simple	Block	1	FALSE	2	0.5	250	250	Y	999999	Not Allowed	FUTURE SIMPLE INSTRUMENT
FDAX	Flexible	Block	1	FALSE	2	0.5	250	250	N	1	Not Allowed	FUTURE SIMPLE INSTRUMENT
FDAX	Simple	Vola	1	FALSE	2	0.5	1	1	Y	999999	Not Allowed	FUTURE SIMPLE INSTRUMENT
FDAX	Simple	EFP Idx	1	FALSE	2	0.5	1	1	N	999999	Not Allowed	FUTURE SIMPLE INSTRUMENT
FDAX	Calendar Spread	Block	1	FALSE	2	0.5	250	250	Y	999999	Allowed	FUTURES SPREAD
OGBL	Simple	Block	1	TRUE	30	0.005	100	100	N	999999	Not Allowed	OPTION SIMPLE INSTRUMENT
OGBL	Flexible	Block	1	FALSE	2	0.005	100	100	Y	1	Not Allowed	OPTION SIMPLE INSTRUMENT
OGBL	Standard Strategy	Block	1	FALSE	2	0.005	100	100	N	999999	Allowed	STANDARD OPTION STRATEGY
OGBL	Volatility Strategy	Block	1	FALSE	2	0.005	100	100	Y	999999	Allowed	OPTION VOLATILITY STRATEGY
OGBL	Non-standard Strategy	Block	2	FALSE	2	0.005	100	100	N	999999	Allowed	NON-STD OPTION STRATEGY

Example 9-2:

The TES profile for a cash market, see the example in the following table:

TES Profile: Example for cash market					
Key		Attributes			
Product	TES Type	Broker Allowed	Max Participants	Allow Auto Approval	Price Validation Rule
ALV	LIS	TRUE	2	Y	PRICE VALIDATION
ALV	OTC	TRUE	2	N	NO PRICE VALIDATION
BMW	LIS	TRUE	2	Y	PRICE VALIDATION
BMW	OTC	TRUE	2	N	NO PRICE VALIDATION
COMST.VERM.STR.- O.U.ETF I	LIS	TRUE	2	Y	PRICE VALIDATION
COMST.VERM.STR.- O.U.ETF I	OTC	TRUE	2	N	NO PRICE VALIDATION

9.5 Basket Trading

Basket trading is a special type of off-book trading. A basket consists of a number of TES trades in different instruments denoted as basket components, being entered, approved, and executed together. The general basket type available is Equity Bespoke Baskets (EBB) while Basket Total Return Futures (BTRF) are baskets consisting only of Equity Total Return Futures (ETRF).

9.5.1 Buckets

Buckets are T7 product groups set up by the exchange specifically for the purpose of defining the products, the instruments of which may occur together in the same basket. The corresponding products of the instruments in a basket must all belong to the same bucket.

Buckets for BTRF consist of ETRF only, while buckets for EBB may or may not contain ETRF. Thus, the basket type corresponds to the type of the chosen bucket. The basket type of a basket cannot be changed.

The information which basket type is defined per product can be found in the reference data. Buckets are also called product pools.

9.5.2 Enter a basket trade

The basket is assembled and entered by a trader or by a broker and is approved and executed as a whole. Each newly created basket receives a basket ID generated by T7. The maximum number of component trades in a basket trade is 199.

A basket trade has exactly one buy and one sell counterparty. A basket trade can be entered by a broker, who is not a counterparty. The basket buy counterparty of a new basket trade is not necessarily the buy counterparty of all component trades, and the basket sell counterparty is not necessarily the sell counterparty of all component trades.

Each component trade of a basket trade must be entered with an individual trade price, which applies only to the TES trade in the concerned component instrument. The prices are validated individually per component instrument, according to the rules for the concerned component instrument and specified TES type.

Most validations apply to the individual components of a basket, but a basket transaction is always accepted or rejected as a whole. A failed validation in one component of a basket trade leads to the rejection of the whole basket transaction. It is therefore always guaranteed that the basket trade is entered, approved and executed as a whole or not at all. The rejection response informs about the rejection reason and the affected component trade.

Both Block and Trade-At-Market (TAM) are supported TES types for basket trades, provided that TAM is allowed for the component product concerned.

The modification of a component trade price is permitted if a basket trade is not yet executed. A new approval is required, if one side already approved the basket trade.

When creating a new BTRF basket, the initiating user has the option to set the Optional Early Termination (OET) flag, which entitles the buyer to close, i.e. terminate, the basket at any given time. Technically, the closing can be initiated by any of the parties involved.

9.5.3 Amending a basket

In a basket amendment operation, participants can change the composition of a specific basket by adding more component trades to the basket, where the additional trades may also be counter trades, effectively reducing or removing individual positions in the basket. T7 supports various types of basket amendment operations, increasing or decreasing or substituting the components of a basket as well as terminating a basket that has the OET flag set.

Substituting and terminating are not available as an amendment for EBB. When amending an existing basket, its profile cannot be changed.

The BTRF basket operation 'Calendar Roll' combines two operations in one, namely unwinding an existing basket and simultaneously opening a new basket with a later expiry.

9.5.4 Execution of a basket trade

After the successful execution, a basket trade is decomposed into its components and the individual trades with a reference to the basket ID in the component instruments are then forwarded to clearing.

9.5.5 Anonymous Baskets

The initiating broker, not being a counterparty, can flag a basket upon entry of the basket either as transparent or as anonymous. In case of anonymous baskets, the counterparties will not get to know each other's identity during the entire lifecycle of the basket.

The flag is visible to all potential counterparties and cannot be modified later. Each counterparty can manage the basket while anonymity will be maintained but has to rely on the initiating broker for counterparty alignments and entry of amendments or substitutions.

Set Up Information:

Eurex decides which buckets support the creation of anonymous baskets.

Currently, individual TES trades in ETRF instruments outside baskets are not allowed.

9.5.6 Special case: Basket Total Return Futures

T7 supports the off-book trading of baskets of ETRF instruments or Basket Total Return Futures (BTRF), cf. the Appendix on Total Return Futures in the *T7 Functional Reference Part 2*. The basket buy counterparty of a new basket trade is the buy counterparty of all component trades, and the basket sell counterparty is the sell counterparty of all component trades. The component instruments in a BTRF must all have the same contract month and year.

Each BTRF basket has a registered basket profile assigned. This profile defines rules for constructing the basket, e.g., which buckets are eligible. It is mandatory to enter the chosen profile in each request when trading in baskets. T7 validates that the profile exists, yet T7 does not validate whether the basket complies with the construction rules defined in the profile. Please find information about BTRF profiles in the document *Contract Specifications for Futures Contracts and Options Contracts at Eurex Deutschland* on www.eurex.com.

The price of a BTRF basket trade is given in the trading notation (TRF spread). Each component trade in a BTRF trade must have the same common price in trading notation. As this overall price may not be an adequate market price in all component instruments, the price validations in a basket trade are more relaxed than those for normal TES trades.

9.5.7 Differences between EBBs and BTRFs

The following list outlines the differences between EBBs and BTRFs:

- For EBBs, it is possible to set the open/close indicator independently for each component trade and each TES trade side.
- For EBBs, it is possible to define moderately differing expiries for the individual component trades. This facilitates the entry of EBBs consisting of component trades which belong to products that have different expiry patterns.
- EBBs only support the basket operation types *New* and *Amendment*.
- For EBBs, the buyer and seller of a basket trade are able to freely choose per component trade to be a buyer or seller, including a mix of buyer and seller roles for the component trades. Particularly, this applies to basket trades which are entered with the basket operation type *New*.
- EBBs do not have an overall basket trade price as BTRFs do.
- For EBBs, the specification of a basket profile is not supported.
- Component trades of EBB trades are reported the same way as other TES trades in the market data. In contrast to BTRF trades, no special indicator is used to mark them as out of sequence in depth incremental messages.
- For BTRF, any third party, not only the counterparties or the broker that originally entered the basket, can initiate an amendment of a basket.
- For BTRF, the initiating user has the option to set the Optional Early Termination (OET) flag, which entitles the buyer to close the basket at any given time.

10. Eurex EnLight

10.1 Overview

T7 provides Eurex EnLight, a selective request for quote service (SRQS), to negotiate off-book transactions electronically. The service helps to provide all the necessary data to prove Best Execution, while also streamlining the current voice driven market.

Set Up Information:

Eurex supports Eurex EnLight on T7 as described in this document.

Currently, Eurex EnLight on T7 is not for the commodity market EEX.

Eurex EnLight provides a workflow-oriented functionality with a private order book for the participants. The requester is sending out a Request for Quote (RfQ) to selected other respondents and is the owner of the private order book of the instrument the RfQ is referring to. After receiving quotes, the owner of the private order book can choose a specific quote by sending an order (HitQuote) with the details of that quote to match, thus creating an Eurex EnLight deal. In order to reach the wanted quantity, more than one deal can be created by sending further orders in response to other quotes.

A deal generated by Eurex EnLight is a non-binding agreement between two exchange participants and is not registered at the exchange as a binding trade. The Eurex EnLight deal is transferred into a binding trade registered at the exchange by converting it to an approved TES trade of TES Type *Eurex EnLight* in T7.

All Eurex EnLight related RfQ, order, quote and deal messages contain a free text field of length 132 characters in order to allow flexible communication. The text field is reflected in the reports, too.

Eurex EnLight trades may serve as the referenced options off-book trade in Vola TES trades, if not negotiated anonymously.

10.2 Product and Instrument Information

In Eurex EnLight the requester sends the RfQ for a particular product and instrument combination. In case of a complex instrument, the requester can submit an RfQ using

- the complete definition of that instrument including leg instruments, their side and ratio; for the underlying leg, the underlying product and underlying instrument can be specified, including optionally the instrument type and subtype.
- the T7 generated instrument identifier along with instrument type and subtype.

It is possible to initiate a Negotiation Event for Flexible Instruments, and also for not-yet existing Complex Instruments. The requester is able to negotiate the underlying as well. The newly created Complex Instrument ID is available in TES trade broadcast, not in the deal broadcast.

The details of the Negotiation Event, including any updates, are communicated to all the respondents throughout the life cycle of the Negotiation Event.

10.3 The Workflow in Eurex EnLight

The Eurex EnLight process workflow follows the Straight-Through-Processing negotiation model (STP). Thus, a Eurex EnLight deal results in a legally binding Eurex EnLight trade with minimum user interaction. The functionality is MiFID compliant.

It is ensured that the checks required for TES trades are part of Eurex EnLight. Eurex EnLight trades are published to the market based on the configured non-disclosure limits like the TES trades. It is possible to indicate the involvement of a third-party which does extra charging for its services.

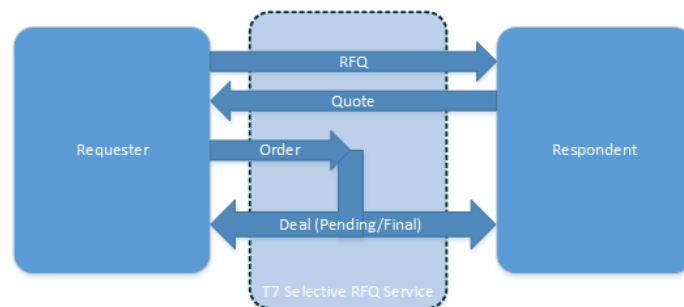
The STP process workflow in Eurex EnLight is divided in two parts:

- Negotiation Event workflow and
- Deal workflow.

10.3.1 Negotiation Event Workflow

The Negotiation Event workflow has the following steps:

1. The requester (typically a broker) sends an RfQ request to start a Negotiation Event with one of the following types of workflow: Regular, Working Delta, Basis Trade, Delta Exchange, VolaRefOnly.
2. The targeted respondents (market makers) are informed about the start of the Negotiation Event with the details about the RfQ that includes the workflow type.
3. The respondents provide quotes and the requester receives information about each quote.
4. Based on the quotes received, the requester can decide to target specific quotes by sending an order (HitQuote) that results in a deal.



Negotiation Event Workflow

10.3.1.1 Request for Quote

An RfQ sent to Eurex EnLight can be targeted to various respondents. The same respondent cannot be targeted multiple times in the same Negotiation Event. For each respondent, the business unit name and the username (e.g. ABCFRTRD001), must be provided. Additional respondents can be added during the lifetime of the Negotiation Event. Existing respondents cannot be removed by the requester.

The requester can define the type of the Negotiation Event as *Indicative* or *Firm*. If the Negotiation type is *Indicative*, then the respondent has the possibility to do a Final Check, i.e., update the deal status in the service to *Final* from *Pending*. Otherwise, if the Negotiation Type is *Firm*, then an order (HitQuote)

of the requester based on the quote of the respondent leads to a *Final* deal in Eurex EnLight immediately.

The Negotiation Event can be started without providing the Side (Buy or Sell) or the quantity as part of the RfQ request sent to the service. The Side can be provided until the first order (HitQuote) is sent by the requester. The Side for the Negotiation Event is fixed once it is disclosed to a respondent or when the first order is sent.

The requester's optionally provided total quantity to be negotiated within the context of the Negotiation Event is automatically shared with the respondents. The total quantity can be reduced at any time by the respondent but cannot be increased once it is disclosed to any one of the respondents. The Negotiation Event's Total Quantity must be multiple of the minimum lot size.

If the RfQ is marked for *Aggregation*, the respondents are allowed to submit quote quantities smaller than the minimum lot size. The requester then manually applies the quantity aggregation to summarize the quantity contributions of the respondents at the same price in order to be compliant with the minimum lot size and thus creates an aggregated off-book trade of the TES type "EnLight".

The requester can provide indicative prices to the respondents at any time during the lifetime of the Negotiation Event.

The requester can decide to disclose the number of respondents to the respondents. The requester also can disclose the Buy Side client to selected respondents.

An Admin User may define (optional) *Compliance Parameters* concerning Eurex EnLight for all users within a business unit. Among them are parameters to regulate the disclosure of information to respondents in Negotiation Events, and the Negotiation Event types (indicative only, firm only, or all) a user can create.

10.3.1.2 Staging of a Request for Quote

Staging an RfQ means that the requester submits an RfQ to Eurex EnLight in a yet suspended state by defining only a few mandatory fields of the RfQ. Staged RfQs are entered on behalf of the *executing trader* who can be the initiating *submitting trader* or another trader who is then informed of the submission. The submitting trader may lock some fields (quantity, trade direction, preferred bid and/or ask), which means that the executing trader cannot breach the instructions provided by the submitting trader.

Subsequently the executing trader supplements and / or – if possible – modifies the fields of the RfQ, and then activates the RfQ, so that it is sent to the respondents. The initial submitting trader of the suspended RfQ receives updates on main events such as quotes received, trades executed, and the end of the negotiation.

It is not disclosed to the respondents that an active RfQ was derived from a suspended RfQ. Staged RfQs can be deleted at any time before they are activated. Amendments are not supported. Once a suspended RfQ has been activated, it follows the existing lifecycle and cannot be turned back into a suspended RfQ. All suspended RfQs are deleted at the end of the day. Any business risk event, such as Stop Trading BU, Stop Trading User or Stop BU by a Clearing Member, results in the deletion of all suspended RfQs.

10.3.1.3 Negotiation Event types of workflow

There are various types of Negotiation Event workflows:

- Regular:
Negotiation of simple futures or options.
- Working Delta (options only):
In this workflow, the respondent can hedge the underlying and may provide a new underlying reference price and / or option quantity as a part of the deal update request. The underlying reference price is mandatory for requesters while initiating the Open Negotiation request in the *Working Delta* workflow. Respondents are not able to change the underlying reference price while entering the quote. More details are specified in chapter 10.4.
- Basis Trade (futures only):
This workflow is similar to the Working Delta workflow, but applicable for futures (simple instruments). The underlying reference price is a mandatory field for requesters. The requester and respondents are not able to change this field any longer throughout the negotiation life cycle. More details are specified in chapter 10.5.
- Delta Exchange (Trade Underlying) Outside T7:
In this workflow the underlying is traded outside the Eurex exchange. Providing the underlying reference price is mandatory for requesters in this workflow. Respondents are not able to change the underlying reference price any longer whereas the underlying delta still can be negotiable.
- VolaRefOnly:
This is a variation of the Delta Exchange (Trade Underlying) at T7 workflow where the underlying is traded at the Eurex Exchange. The requester has to fix the underlying price and the underlying delta in this workflow while initiating the Eurex EnLight Negotiation Event. There is no possibility for the respondent to update these parameters throughout the negotiation cycle.

10.3.1.4 Negotiation Event Identifiers

Eurex EnLight generates a Negotiation Event Identifier for each Negotiation Event, such that each Negotiation Event can be uniquely identified for the business day. This identifier must be present on every request for a particular Negotiation Event.

The requester can provide an alphanumeric Negotiation Event Report Identifier for the Negotiation Event. This report identifier is not validated for uniqueness.

Both identifiers are fixed for the lifetime of the Negotiation Event and are visible to all participants of the Negotiation Event.

10.3.1.5 Termination time of the RfQ session

Once a Negotiation Event is generated, the requester and the respondents are informed about the time when the RfQ session is automatically terminated (this point in time also known as T1). When a new respondent is added to a Negotiation Event using the Negotiation Event Update request, the new respondent is also informed about this time.

This time period is increased by an additional delay of 10 seconds in order to have a minimum time of at least 10 seconds to ensure a correct handling of complex instruments newly created for this deal.

10.3.1.6 Negotiation Event Status

The Negotiation Event is started with the initial status *Open*. The status *Open* implies that it is possible to place quotes and orders (HitQuotes) for the Negotiation Event in Eurex EnLight.

When the Negotiation Event status changes to *Closed*, the state of the quotes and the *Pending* deals in Eurex EnLight are set to *Rejected* and it is not possible to enter new orders and quotes for this Negotiation Event. The requester and respondents are informed about the change of the status. The Negotiation Event status is changed to *Closed* in the following scenarios:

- The requester, i.e., owner of the Negotiation Event ends the Negotiation Event by updating its status to *Closed*.
- The open quantity was disclosed earlier to at least one respondent. The open quantity is reduced to zero due to deals in Eurex EnLight or the owner has reduced the total quantity such that the open quantity is reduced to zero, the Event Type is *Indicative* and all deals generated within the Negotiation Event have status *Final*.
- The time for the Negotiation Event expires.
- The TES activity status changes to another state than *On*.
- The instrument moves out of the on-book trading phase.

10.3.1.7 Selective Disclosure of Information

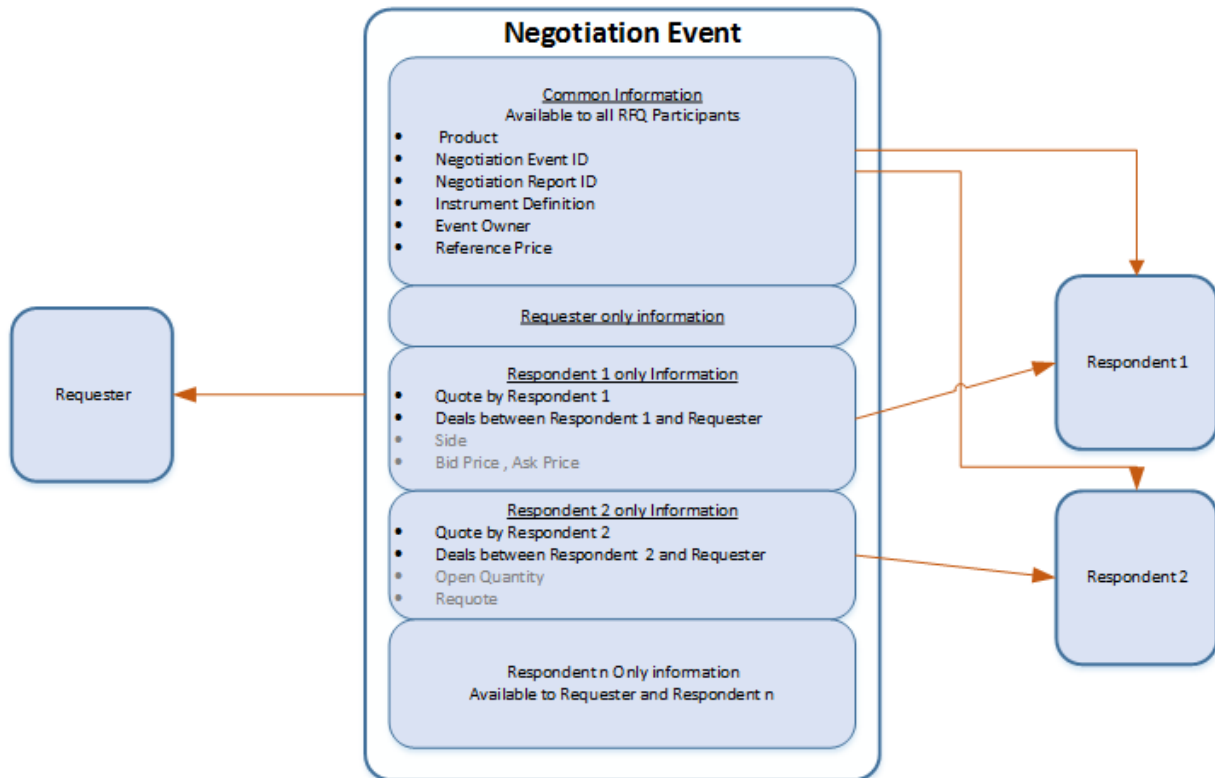
The requester decides when and to whom to disclose information. The requester can provide the following selective information to the selected respondents:

- **Quantity** – the respondent can be shown the open quantity.
- **Side** – the respondent can be shown the side of the requester.
- **Price** – the respondent can be shown the indicative or preferred bid and ask price
- **Requote** – the respondent can be prompted to quote again.
- **Last Negotiated Price** – the respondent can be shown the negotiated price of the last finalized deal (Deal Status *Final*) for that negotiation event.
- **Last Negotiated Quantity** – the respondent can be shown the negotiated quantity of the last finalized deal (Deal Status *Final*) for that negotiation event.
- **Number of Respondents** – the respondent can be shown the number of respondents.

10.3.1.8 Show last deal on closure

The requester can decide to disclose the information about the last deal in case an automatic closure of the negotiation is triggered, i.e., when the negotiation quantity is fully executed. Then, the last deal's price, quantity and time are disseminated to all respondents who responded with a quote (but not with *Working* or *Decline* status). The information is not disclosed if the requester manually reduces the open quantity to 0 or closes the negotiation while the open quantity is greater than 0. The requester can decide on the disclosure of information until the negotiation is closed.

If information that has already been disclosed to a respondent has changed, the requester may decide not to inform the respondent again about the update.



Information Flow in Eurex EnLight

10.3.1.9 Quotes in Eurex EnLight

Each respondent can have only one quote (single- or double-sided) for a particular Negotiation Event at the same time. Such a quote can be sent only for an Open Negotiation Event and only by a user (or head trader, or supervisor), who is specified as a respondent in the Negotiation Event.

The quote has to contain all the relevant information for a TES Trade including MiFID and clearing fields. Each Eurex EnLight Quote entry is validated with all TES related validations and, if any of the validations fails then the request is rejected. The clearing and MiFID fields in Eurex EnLight Quote message are not visible to the requester.

Price of a Quote sent to Eurex EnLight – In case of complex instruments, the price on each quote side is the price for the complete complex instrument, i.e., quoting the individual legs is not supported.

For selected products, Eurex EnLight allows trading in *Subticks*, i.e., it is possible to enter a quote in the service with price in finer increments as compared to the tick size defined for the product. The allowed granularity or *Subticks* is defined by a *Subtick Factor*.

$$Subtick = \frac{TickSize}{SubtickFactor}$$

The quote with a granularity in *Subticks* must fulfill the requirement that the price divided by the tick size of the product and multiplied by the provided quantity is an integer:

$$If \left(\frac{Price}{TickSize} \right) \times Order\ Quantity\ is\ integer$$

Quantity of a Quote sent to Eurex EnLight – in case of complex instruments, the quantity on each quote side is the quantity for the complete instrument, i.e., no separate quantity for the individual legs is provided.

Free Text Field – the Enter Quotes request of Eurex EnLight support a free text field, which can be used by the respondent to provide a specific information to the requester.

Quote Deletion – respondents can delete their quotes as long as they are active, i.e., not deleted by Eurex EnLight. Both quote sides of the quote are deleted together, i.e., it is not possible to delete an individual quote side in Eurex EnLight. Once a quote is deleted and the Negotiation Event status is still *Open*, then the respondent can quote again.

Quote Update – the Enter Quote request of Eurex EnLight can also be used to update the existing quote of the respondent. All quote sides that are part of such Quote request have to be updated together. It is not possible to update a quote side in Eurex EnLight individually. A Quote update in the service is in essence a quote deletion and entry of a new quote.

Quote Identifier – Eurex EnLight generates an identifier with every successful processing of the Quote Entry request that leads to a new or updated quote side. The identifier is unique for the combination of Negotiation Event and the respondent.

Underlying Delta and Underlying Price – As specified in chapter 10.3.1, depending upon the workflow type it is decided whether the respondent can provide the underlying price and underlying delta while entering the quote.

10.3.1.10 Auto Pulling of Quotes

Respondents may optionally define a Pull-In time for each of their Eurex EnLight quotes, after which the quote is automatically deleted. The respondent sees the defined Pull-In time and the remaining Pull-In countdown time. It is possible to define a default Pull-In time that is used every time a quote is submitted or amended via the T7 Trader GUI (but not via ETI). The Pull-In time is not disclosed to the requester.

The Pull-In countdown timer will stop prematurely, only if

- The respondent updates the quote status to *Working*.
- The respondent updates the quote, thus the Pull-In timer starts again.
- The quote is deleted, also by a risk event, or declined, or met by a HitQuote, or the Negotiation Event expires.

10.3.1.11 Eurex EnLight Respondent's Actions

Respondents can react on an RfQ in several ways. Besides the two possibilities to send a quote or not to react at all, the respondent has the following two options to react:

- *Working* – Communicate the intention to send a quote, yet time for calculating is needed.
- *Decline* – Communicate the intention not to send a quote.

If a respondent sends *Working* or *Decline* after having sent a quote, this quote is deleted.

10.3.1.12 Requester's orders (HitQuotes)

Once the respondents have provided quotes, the requester can send orders (HitQuotes) to Eurex EnLight to trade with the quotes. The quote identifier and the quote side must be specified in the order, so that a specific quote side of the respondent can be targeted. Eurex EnLight matches the order with the targeted quote side, with the quote price and the quantity provided in the order and thus generates a deal.

Eurex EnLight accepts only one order in response to a particular quote side from a particular respondent. Once a quote side is targeted, it is not available for consideration for a new order, i.e., the remaining quantity of the quote side is deleted.

The order (HitQuote) has to contain all the relevant information for a Eurex EnLight Trade (TES Type = *Eurex EnLight*) including MiFID and clearing fields, so that it can result in a Eurex EnLight Deal. The clearing and MiFID fields in Eurex EnLight order message are not visible to the respondent. Each Eurex EnLight order entry is validated and if any validation fails then the request is rejected. Please note that for the trading capacity *Agency* there is a strict validation for valid values for the field *Rate Identifier*, also known as *Customer Order Handling Instruction*.

Restriction on Order Quantity – the quantity provided in an order (HitQuote) in Eurex EnLight blocks the same amount of quantity from the open quantity of the Negotiation Event. This quantity is released if the *Pending* deal is *Rejected*. The quantity should be less than or equal to the Negotiation Event open quantity. The quantity has to be equal or less than the quantity provided by the respondent in the quote at the price of the order and with side opposite to the order.

The order quantity is validated against the minimum lot sizes optionally defined in TES profile.

Minimum Number of Respondents – There is a minimum number of respondents of different business units per Product Assignment Group. It is defined by the exchange. Only if this minimum number is reached, additional respondents from the same business units are allowed to participate.

Underlying Quantity – The requester needs to provide – if applicable – the underlying quantity based on the formula as mentioned below.

Underlying Quantity

$$= \text{Integer Rounding} \left(\frac{\text{UnderlyingDelta} \times \text{Greatest Common Multiplier} \times \text{ContractValue}_{\text{Option}}}{100 \times \text{ContractValue}_{\text{Futures}}} \right)$$

$\times$ *Order Quantity*

The *Greatest Common Multiplier* in the above formula is the greatest common multiplier based on the ratio of the option's legs as specified in the Negotiation event.

The *Integer Rounding* means *commercial rounding*, i.e., to round up for values $\geq x.5$ and to round down for values $< x.5$.

Validity Time – to speed up the 'Final Check' process, it is possible to provide validity time on the order for *Indicative* Negotiation Event type. This validity time is set on deals with status *Pending*. If the status of a *Pending* deal is not changed to *Final* or *Rejected* and the validity time is reached, then the deal status is changed to *Rejected* by Eurex EnLight.

Order delay, number of quotes – an Admin User may define (optional) *Compliance Parameters* concerning Eurex EnLight for all users within a business unit. Among them are parameters to regulate the minimum delay of orders compared to the start time of the respective Negotiation Event, and in case the validation for order delay fails, then there is another validation for a required minimum number of quotes. These validations are applied only once, in order to count all available quotes once before they are hit and removed one after the other, thus successively decreasing the available number of quotes.

Order Side – the side of the order (HitQuote) must always be the same as the side provided as part of the Negotiation Event. If no side is provided on the Negotiation Event when the order is entered, then the side of the order is considered as the side of the Negotiation Event.

Free Text Field – the Enter Order request for Eurex EnLight supports a free text field, which can be used by the requester to provide specific information to the respondent. This information is part of the Deal notification that Eurex EnLight generates.

Targeting Quote Side with Subtick Price

When there is an order (HitQuote) with a subtick granularity, Eurex EnLight generates two deals: one with a price rounded down to the next valid price according to the tick size; another one with a price rounded up to the next valid price according to the tick size. The quantities of the deals are calculated as follows:

$$\text{Deal Quantity at a Higher Tick} = \left(\frac{\text{SubtickPrice} - \text{RoundedDownPrice}}{\text{TickSize}} \right) \times \text{Order Quantity}$$

$$\text{Deal Quantity at a Lower Tick} = \text{Order Quantity} - \text{Deal quantity at a Higher Tick}$$

Example 10-1:

The product OGBL has tick size 0.01. The Subtick Factor may be configured as 4, i.e., 0.0025 as subticks. If an order in Call Jan27 Strike 163.50 with price 0.0925 and quantity 450 is placed in Eurex EnLight in response to a quote with price 0.0925 and quantity 500 then the order is rejected indicating that the provided quantity cannot be used for subtick prices. An order with quantity 440 would result in two deals: one deal with price 0.10 and quantity 110; another deal with price 0.09 and quantity 330.

Deal Report Identifier – the requester can provide as part of the order a text identifier. Eurex EnLight generates a deal from this order with a Deal Report Identifier set to this value. The identifier is not validated for uniqueness.

If the Negotiate Underlying flag is set, i.e., the delta and the underlying price are being negotiated, then the requester must provide the underlying quantity as part of the order request.

10.3.2 Deal Workflow in Eurex EnLight

The Deal workflow in Eurex EnLight starts with the creation of a deal and also contains updates to deals. *Final* deals are executed automatically as TES trades after a certain delay of time.



Deal Workflow in Eurex EnLight

Deals in Eurex EnLight – the service generates a deal when an order (HitQuote) is allocated to a quote side. The deal is communicated both to the requester and the respondent. Once it is generated, the corresponding quote side is set to *Executed* and is removed from the order book of Eurex EnLight.

Pending Deal – a deal generated within an *Indicative* Negotiation Event has the status *Pending*. The respondent can set the status from *Pending* to *Final* or to *Rejected*. The requester can set the status from *Pending* to *Rejected*.

A deal with status *Pending* in Eurex EnLight can have an attribute Validity Time based on the order Validity Time. In case the validity time is reached, the service changes the deal status from *Pending* to *Rejected*.

Once the status of the deal is changed to *Rejected* or *Final*, it cannot be updated anymore. For deals resulting from Negotiation Events with *WorkingDelta* indicator set, there are further possibilities; see chapter 10.4 below.

Final Deal – Once the status is *Final* the deal can be cancelled only by mutual agreement of requester and respondent. A deal generated in Eurex EnLight within a *Firm* Negotiation Event always has the status *Final*.

Deal Identifier – Eurex EnLight generates a Deal Identifier, which is provided on the TES trade as *Trade Description* and can be used by Participants to link the TES trades and the deal. In order to provide a reliable linkage, the Deal Identifier is unique for the product during the business day.

10.3.2.1 Time delay until TES trade execution

All *Final* Eurex EnLight deals are queued by Eurex EnLight for further processing and thus delayed for a certain amount of time until TES trade execution (the delay also known as T2). All involved participants are informed about the delay time until TES trade execution via updates of deal notifications. The duration of this period is defined by the exchange. During the delay period, both requester and respondents can cancel a *Final* deal on mutual agreement.

10.3.2.2 End of delay until TES trade execution

The point in time at the end of the delay until TES trade execution (also known as *Time2Transfer* or T3) is defined as the time T1 plus the delay T2, but no longer than the maximum time limit for the deal transfer to TES (*maxExpiryTimeSRQS*), defined by the exchange.

Upon the end of the delay, all the Eurex EnLight *Final* deals are moved straight away from Eurex EnLight to TES and converted into approved TES trades with TES type *Eurex EnLight* without any further intervention, approval, or confirmation by the users.

10.3.2.3 Update of the Deal Status in Eurex EnLight

For an Indicative Negotiation Event Eurex EnLight allows an update of deal status by both requester and respondent. Every update of the deal status is communicated to both parties.

The respondent can update the deal status from *Pending* to *Final* or *Rejected* (cancelled), whereas the requester can update the deal status from *Pending* to *Rejected*. A deal in status *Working* can be cancelled only by a respondent. A deal in status *Final* can be cancelled only on mutual agreement.

Once a deal status is set to *Rejected*, the Negotiation Event open quantity is increased by the quantity of the deal.

10.4 Eurex EnLight “Working Delta” Negotiation Model

With the Working Delta negotiation model, the respondent can hedge the underlying and may provide a new reference (underlying) price and / or option quantity as a part of the deal update request. Depending on the polarity (positive/negative) of the delta entered by the respondent in a quote, the hedge is determined either as *Buy Hedge* or *Sell Hedge*. Based on the new reference price, Eurex EnLight calculates a new option price using the agreed delta and disseminate it to the counterparties. Once respondents have managed to hedge all (or some) of the agreed quantity, they can then update and later on finalize the deal.

10.4.1 Working Delta Principles

The negotiation model Working Delta works on the following principles:

- Working Delta is only available for options instruments. Asset classes in scope are Equity, Equity Index and Fixed Income. This functionality is not applicable for Option Volatility Strategies hence Delta Exchange is not supported, but negotiation of underlying delta or / reference price is still possible as part of the Request for Quote (RfQ). All Standard and Non-Standard Options Strategies are in scope.
- Working Delta functionality is allowed only for negotiation type *Indicative*.
- The requester can allocate the deal only to one respondent at a time.

The polarity of the hedge (*Buy hedge*, or *Sell hedge*) is determined by the following formula:

$$\text{Buy or Sell Hedge Value} = \text{Delta Polarity} * \text{Strategy Side}$$

with the *Delta Polarity* from the respondent's perspective,
i.e. +1 or -1 on buying respectively selling the hedge;
with the *Strategy Side* from the requester's perspective,
i.e. +1 or -1 on buying respectively selling the hedge.

If the *Buy or Sell Hedge Value*

- equals +1, then it is a *Buy Hedge*.
- equals -1, then it is a *Sell Hedge*.

If the requester provides the Underlying Limit (UL) Price Boundary, then there are restrictions for the respondent to enter the new UL reference price, depending on Buy Hedge or Sell Hedge.

In case of a *Buy Hedge*, the UL Limit Price Boundary is the upper limit.

- The respondent may enter a new UL reference price $\leq$ UL Limit Price Boundary.
- The requester may change to a higher price afterwards, however not to a lower price.

In case of a *Sell Hedge*, the UL Limit Price Boundary is the lower limit.

- The respondent may enter a new UL reference price $\geq$ UL Limit Price Boundary.
- The requester may change to a lower price afterwards, however not to a higher price.

If the requester does not specify any UL Limit Price Boundary, then the respondent is able to provide a new UL reference price without any restrictions.

10.4.2 Working Delta Workflow

The Working Delta workflow is a variation of the Eurex EnLight workflow described above:

1. The requester initiates a negotiation event by sending an RfQ with the *Working Delta* indicator. Eurex EnLight notifies all the counterparties via broadcast.
2. In order to give all parties more time to negotiate the deal, the termination time of the RfQ is calculated as the maximum time limit for the deal transfer to TES minus the time delay until the TES trade execution.
3. Respondents can respond to the RfQ by sending a quote.
4. The requester can answer quotes by either sending an order (HitQuote) resulting in a deal with deal status *Pending* or may also choose not to respond to the quote.

Additionally, the requester can also define an Underlying Price Boundary (Underlying Limit Price) while sending the order, which is then communicated to the respondent. The requester can modify this Underlying Price Boundary as long as the deal is not final and only in favor of the respondent. In case of a *Buy Hedge*, the underlying limit price may only be increased. In case of a *Sell Hedge*, the underlying limit price may only be decreased.

5. The respondent can respond to the pending deal with one of the following actions:

Action	Description	Deal status
Working	Possibility to update the deal.	<i>Working</i>
Reject	The respondent rejects the deal.	<i>Rejected</i>
Accept	The respondent accepts the deal.	<i>Final</i>

6. In the Working mode, the respondent is allowed to make adjustments to two parameters (optional) of the deal:
- Reference price.** In case of a *Buy Hedge*, the new reference price has to be less than or equal to the underlying limit price. In case of a *Sell Hedge*, the new reference price has to be greater than or equal to the underlying limit price.
 - Options quantity.** The option quantity can only be equal or lower than what was initially agreed and cannot be below the Eurex EnLight Minimum Block Trade Size. If the respondent has modified the option quantity, the respondent should not be able to reduce this quantity with any further modifications, but only to increase it.
7. Based on the new reference price, Eurex EnLight calculates the new option price. The new option price is calculated according to the following formula:

New option price

= Previous option price

+ underlying Delta × (New reference price – Old reference price)

whereby *underlyingDelta* is positive, if the underlying hedge is bought, and negative, if it is sold, from the respondent's perspective. In case of an Options Volatility Strategy instrument, Eurex EnLight determines the delta's polarity (+ or -) from the instrument's signature.

- The deal is adjusted with the new option price and option quantity and the adjusted deal is broadcasted to the involved requester and respondent.
- The respondent can accept the deal, reject the deal, or continue to update the deal in this Working Delta negotiation model.
- When the respondent accepts the deal,
 - The resulting new option price (if any) is rounded to the closest tick or subtick in case the subtick factor is greater than 1. If subtick is enabled, then Eurex EnLight first assigns nearest subtick and validates the deal split; if validation fails then the new option price is rounded to the nearest tick.
 - In case the new option price and new option quantity are missing, then Eurex EnLight verifies the deal split for the initially agreed deal price and quantity.
 - Finally, Eurex EnLight generates the new deal (or split deals) with new deal ID(s), deal status *Final*, and notify the counterparties about deal finalization.

11. The requester has the following possibilities of deal rejection for the negotiation type *Working Delta*:
- The requester shall be able to reject a deal as long as it is in status *Pending* or the deal can become expired due to a time out.
 - The requester shall not be able to reject a deal if it is in *Working* or *Final*.
 - The requester shall not be able to close the RfQ session as long as the deal is in *Working*.

10.5 Eurex EnLight Basis Trading Negotiation Model

The Eurex EnLight Basis Trading negotiation model supports outright futures trading by reducing the underlying delta risk of respondents as the negotiation is only around the basis between the underlying and the futures. The negotiation of the underlying risk is continued after a deal of the basis has been agreed and has been transferred to the requester. Respondents are able to update the futures quantity but cannot go beyond the deal quantity. The underlying reference price is a mandatory field for requesters and respondents are not able to change this field any longer. Once the deal has been finalized, a regular outright EnLight TES trade is executed.

The Eurex EnLight Basis Trade workflow works as follows:

- The requester initiates the negotiation by setting the Basis Trade identifier and must provide a reference price while initiating the RfQ.
- The respondent can answer to the RfQ by sending a quote with Basis bid, Basis ask, bid quantity, ask quantity.
- Eurex EnLight calculates the bid and ask price based on the reference price and Basis bid / Basis ask prices where the delta is fixed to 100%. These fields are non-editable by the users.
- The requester can enter an order (HitQuote) and may also provide a *Reference Price Limit* similar to *Working Delta*.
- In working mode (deal status *Working*), the respondent may provide the following:
 - New reference price.
 - New futures quantity.
- Eurex EnLight calculates the new futures price based on the reference price:

$$\text{New future price} = \text{New reference price} + \text{basis}$$
- The respondent can set the deal status to one of the following, while updating the deal:
 - Pending* to *Working* – Deal in working status.
 - Pending* to *Reject* – Respondent can reject the working deal.
 - Pending* to *Approve* – Deal finalized with futures quantity, futures price.
 - Working* to *Approve* – Deal finalized with adjusted futures quantity, new futures price.

Like in other workflows the requester and the respondent are able to chat during the negotiation. It is also possible to respond on-behalf. Deals at a synthetic *Half Tick* are supported. The Eurex EnLight Basis Trade Functionality is available only for the *indicative* workflow.

10.6 Eurex EnLight SMART Request for Quote

Eurex EnLight SMART Request for Quote allows Eurex EnLight requesters to target those potential respondents who most likely have an interest in a specific RfQ. Before sending an RfQ, a requester can inquire an individually weighted Eurex EnLight SMART Respondent List for the wanted product. The respondents in the list are chosen by Eurex EnLight according to four different weight criteria, weighted by the inquiring user:

- Eurex Volume Ranking.
- Eurex EnLight RfQ Average Response Time Ranking.
- Eurex EnLight RfQ Average Response Rate Ranking.
- Trade-to-Quote Ratio Rating (TQR).

The list consists of 6 proposed respondents. If no potential respondent matching the criteria is found, the inquiry results in an error message. The proposed list is neither binding for the requester nor for the respondents. Requesters decide freely to target any potential respondent, and the respondents decide freely to answer to any Request for Quote.

Before being considered in these calculations, the respondents have to sign up and confirm / consent to the use of their data. Eurex EnLight users who want to be included as potential Eurex EnLight SMART respondents are assigned by their Admin user in the Admin GUI to the Eurex EnLight SMART Respondent Assignment list, only one user per product and Business Unit.

Please note that the rankings and statistics of all users in a user group are consolidated. The requester's TQR and each respondent's TQR ranking among all respondents is visible to the respondents.

Requesters do not need to sign up for Eurex EnLight SMART to inquire the Eurex EnLight SMART Respondent List.

10.7 Eurex EnLight Anonymous Requests and Responses

Eurex EnLight provides the possibility to negotiate deals and make trades without disclosing the identity of the requester and/or of respondents.

10.7.1 Trade to Request Ratio

With each anonymous RfQ a Trade to Request Ratio (TRR) is published. This ratio gives an indication of the requester's historical behavior to trade based on quotes received. The TRR is calculated as division of the total number of RfQ sessions over a time period where there had been at least one resulting TES Trade – divided by the total number of RfQs sent by the requester where there were one or more responding quotes. Multiple RfQs sent in one session count as one RfQ.

Example: 250 RfQ sessions (at least 1 RfQ sent), resulting in at least 1 TES trade, divided by 800 RfQ sessions (at least 1 RfQ sent), with one or more respondent quotes, resulting in a TRR of $250 / 800 * 100 = 31.25\%$.

The higher the TRR, the higher the likelihood and intention of the requester to trade based on historical observations. Therefore, respondents are able use the TRR to identify high performing requesters.

10.7.2 Anonymous Negotiation Event

The anonymous Negotiation Event basically follows the same rules as a non-anonymous Negotiation Event, except the following specialties:

- When the requester sends the anonymous RfQ, the list of respondents is not yet anonymous; the respondents are anonymous when replying with a quote.
- It is not possible to add respondents for the same Negotiation Event after sending the RfQ.
- An anonymous User ID is randomly created for each user for each new anonymous RfQ. This ID is used throughout the whole negotiation process (in the RfQ, in the respondent's quote, in the order (HitQuote), and in the struck deal, but not in the TES trade).
- It is also possible to chat anonymously.
- There is a special minimum number of respondents of different business units per Product Assignment Group to start an anonymous negotiation event. It is defined by the exchange. Only if this minimum number is reached, additional respondents from the same business units are allowed to participate.

10.7.3 Respondent's exclusion list

Respondents can configure their preferences concerning anonymous RfQs in an exclusion list. There, they define per Product in an intraday update:

- Whether to allow (default) or block all anonymous RfQs.
- Whether to block anonymous RfQs with the requester's Trade-to-Request Ratio (TRR) less than a configurable threshold.
- The TRR threshold.

Requesters still see the excluding respondents, yet they are marked with the reason for the exclusion (Either "Anonymous not accepted" or "TRR threshold too high").

10.7.4 Limitations concerning trade reversal

A trade reversal breaks the anonymity. The ETI broadcast messages of a trade reversal do not mask the identity of the trade participants.

Configuration Data:

Values configured by Eurex exchange for Eurex EnLight Anonymous Requests and Responses:

- *The rounding precision by which the requester's TRR is rounded when disclosed to the respondents as a rounded number. Only the requesters themselves can see the exact number of their TRR.*
- *The minimum number of respondents from different business units per Product Assignment Group to start an anonymous negotiation event and to allow additional respondents from the same business units.*
- *The technical upper limit for the number of anonymous requests per business unit per trading day.*

11. Xetra EnLight

11.1 Overview

T7 provides Xetra EnLight, a selective request for quote service (SRQS), to negotiate off-book transactions electronically. The service helps to provide all the necessary data to prove Best Execution, while also streamlining the current voice driven market. Xetra EnLight is an off-book on-exchange service that is MiFID II compliant.

[Set Up Information:](#)

[Xetra EnLight on T7 is set up for Deutsche Börse Xetra.](#)

Xetra EnLight provides a workflow-oriented functionality with a private order book for the participants. The participant is sending out an RfQ to selected other participants and is the owner of the private order book of the instrument the RfQ is referring to. After receiving quotes, the owner of the private order book can choose a specific quote by sending an order with the details of the quote to match, thus creating a Xetra EnLight deal.

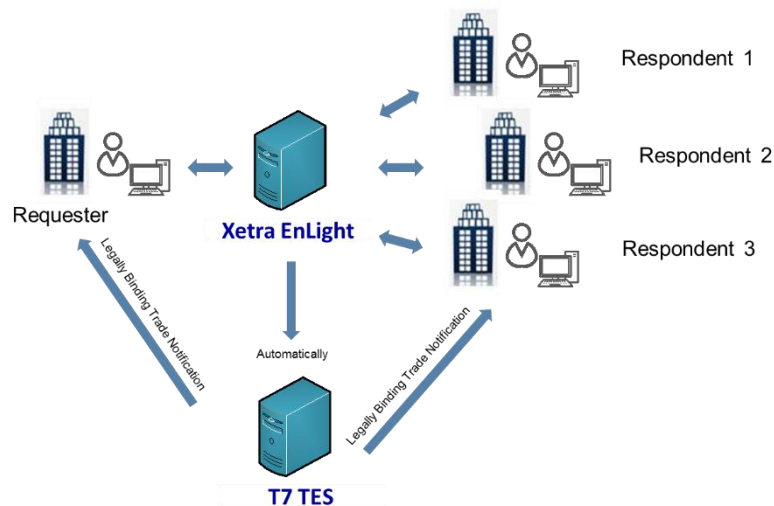
A deal generated by Xetra EnLight is a legally binding agreement between two exchange participants, immediately registered at the exchange as a binding trade (Straight Through Processing).

For instruments traded on-book, Xetra EnLight is available as long as on-book trading is available (i.e., instrument state is not *Suspended*, *Stopped*, *Pending Deletion*, *Last Trading Day in Past*, *Expired*, *Closed*, or *Restricted*) and when TES Activity Status is *ON*. Xetra EnLight trading can also be enabled for instruments that are not enabled for on-book trading.

Historical data of the negotiation events of the past trading day is provided in the XML reports *TC600 Xetra EnLight Maintenance* and *TC610 Xetra EnLight Best Execution Summary*. Furthermore, T7 provides online access to historic negotiation event data not older than two years.

11.2 Process Workflow in Xetra EnLight

The process workflow of the negotiation in Xetra EnLight has the following steps:



Xetra EnLight Workflow in Straight Through Processing

11.2.1 Request for Quote

The requester sends a Xetra EnLight Request for Quote (RfQ) request to the Xetra EnLight Service, starting a Xetra EnLight Negotiation Event in status *Open*, with a *Negotiation Event Identifier* unique for this day. The requester has to define a total quantity of the RfQ. The requester may define an expiry duration time for the RfQ. If it is not provided, then the maximum duration time defined at product level by the exchange is used. The Negotiation Event can be started without providing the *side* (Buy or Sell) as part of the RfQ request, if not configured otherwise. The side can be provided until the order (HitQuote) is sent by the requester. The side for the Negotiation Event is fixed once it is disclosed to a respondent or when an order is sent.

The requester can configure an automatic execution (AutoEx) for the Negotiation Event when starting the event. For this, the requester is able to define three values with the Negotiation Event: Quote collection duration, Minimum number of quotes, and Price criterion. For the automatic execution to result in a complete trade, the requester has to provide all the required MiFID II and clearing fields which are normally provided via the Hit Quote.

11.2.1.1 Staging of a Request for Quote

A trader can submit an RfQ as *Staged RfQ* with status *Suspended*, either on its own behalf or on behalf of another trader. A suspended RfQ can be released (i.e., turned into an active RfQ) by the executing trader who acts as requester. The executing trader and the submitting trader can be one and the same user or two different users. The executing trader may define missing fields on releasing a suspended RfQ. The submitting trader may lock some or all the following fields while submitting a suspended RfQ, which means that the executing trader is not able to change the instructions provided by the submitting

trader: Quantity, Trade direction. Locking the preferred Bid and/or Ask serves as boundaries for the submitting trader.

11.2.1.2 Validations of a Request for Quote

Whenever a RfQ is submitted, the following validations are performed concerning its volume:

- The Minimum size validation for the RfQ: The Total Quantity of the negotiation $\times$ Last Trade price (or Reference price) has to be greater than or equal to an instrument-specific, exchange-defined threshold called *SRQS minimum size*¹².
- The Large in Scale (LIS)¹³ check for Xetra EnLight quotes: If the Total Quantity of the negotiation $\times$ quote price is not greater than or equal to the *PreTradeLISValue* for the instrument, then the respective Xetra EnLight quotes with a volume below LIS are published in market data.

In case of a Staged RfQ, the suspended RfQ is validated when submitted to Xetra EnLight, but many fields are optional in comparison to a regular RfQ and may therefore not be provided.

11.2.1.3 Notifications

The Xetra EnLight service informs the targeted respondents about the start of the Xetra EnLight negotiation event with all details of the RfQ. When the requester updates the RfQ, all targeted respondents who have not yet declined are informed again about the update.

In case of a Staged RfQ, the submitting trader and the executing trader are notified once a suspended RfQ is submitted. The submitting trader is informed about the release or deletion of the RfQ as well as about respondents' quotes and trades. The respondents do not get to know the submitting trader.

11.2.2 Respondents' Quotes

The respondents can provide quotes in response to the Xetra EnLight RfQ, or they can send the informational message "working" to the requester, or they can explicitly decline, or not react at all. Respondents can also define a time after which their quote is automatically removed, if no deal was struck.

The respondents can update, delete or re-enter quotes as long as the Negotiation Event is *Open*. Each such action creates a unique quote identifier. If the respondent's users in the same Negotiation Event belong to the same business unit, at least one of the users has to set the trading capacity to *Agency*. The respondents' quotes have to fill the required quantity of the RfQ exactly. The quote quantity is validated against the *Maximum Order Quantity* and *Maximum Order Value* defined on user level, if configured, and against $\text{bid/ask quantity} \times \text{bid/ask price} \geq \text{SRQS minimum size}$ for the instrument. The quote price has to be within a price deviation range in percent around the best bid/ask of the regular on-book order book. If the best bid/ask is not available, the reference price (i.e., last traded price resp. last available auction price) is used. Bid and ask prices of the quote can be

¹² The *SRQS minimum size* is defined on instrument level and distributed in the reference data on the Cash Market website cashmarket.deutsche-boerse.com under the link: Xetra > Instruments > All tradable Instruments > T7 (XETR) Static Instrument Reference Data.

¹³ The *PreTradeLISValue* is defined on instrument level and distributed in the reference data on the Cash Market website cashmarket.deutsche-boerse.com under the link: Xetra > Instruments > All tradable Instruments > T7 (XETR) All tradable instruments.

validated against either the price step and tick size configuration set especially for Xetra EnLight or against the price step and tick size configuration as applied for on-book.

The requester is informed about the reaction, and about updates of respondents' quotes. If a respondent sends "working" or "decline" after having sent a quote, the quote is deleted.

11.2.3 Strike a deal

The requester has several possibilities to finalize the negotiation:

- The requester can choose a specific quote by sending a deal-making order (also known as *Hit Quote*) with the details of the quote to match, or
- The requester can opt for an automatic allocation.
- In case an automatic execution (AutoEx) was configured for the Negotiation Event, the quote with the best price is matched automatically, if the user-defined minimum number of quotes is reached within the quote collection duration, and if one or more quotes fulfill the price criterion, at the end of the quote collection duration. If there are multiple quotes at the best price, one of them is chosen randomly. The price criterion consists of a chosen reference price and an offset to it. The configured reference price may be one of the following prices:
 - Midpoint of the published order book of the corresponding market.
 - Best bid of the published order book of the corresponding market.
 - Best ask of the published order book of the corresponding market.
 - Requester-defined limit price.

The requester's order (HitQuote) has to fulfill certain requirements: The order quantity has to be equal to the total order quantity of the Negotiation Event (Open Negotiation Request). It can be configured by the exchange that the order quantity is validated against the *Maximum Order Quantity* and *Maximum Order Value* defined on user level. Besides this, there is always a validation for the *Maximum Order Quantity* and *Maximum Order Value* defined on exchange level. The Maximum Order Value check is based on the reference price. The HitQuote is also validated against the HitQuote's bid/ask quantity $\times$ bid/ask price $\geq$ SRQS minimum size for the instrument. The side of the order must always be the same as the side provided as part of the Negotiation Event. If no side is provided on the Negotiation Event when the order is entered, then the side of the order is considered as the side of the Negotiation Event. In case of requester's users belonging to the same business unit, at least one user has to have the trading capacity *Agency*.

By choosing one of the alternatives for quote selection and then sending an order to hit the quote, a Xetra EnLight deal is generated with a Deal ID unique for this day. This deal automatically results in a legally binding T7 TES trade without any further interactions by the counterparties (Straight Through Processing). If automatic allocation is selected and two or more quotes have the same best limit, then the quote to be executed is selected by a random algorithm. All other quotes provided for this Negotiation Event are deleted. The T7 TES trade which is based on a Xetra EnLight deal is marked specifically via the TES type Xetra EnLight.

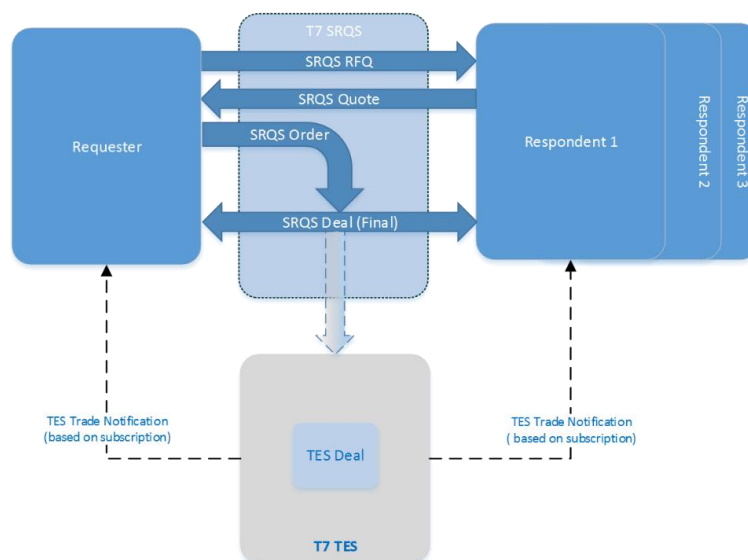
The status of the Negotiation Event goes to *Close*, if the total quantity of the RfQ is consumed by a deal, or if the requester sets it to *Closed*, or if the time of the Negotiation Event is expired, or if the TES activity status changes to another state than *On*, or if the instrument moves out of the on-book trading phase. The Xetra EnLight respondents whose quotes have not been selected are informed about the reason (e.g. if the quote's price was not top of the quote book) by Xetra EnLight.

11.2.4 Execution

The Requester is provided a snapshot of active quotes and status of each respondent at the time the Xetra EnLight Deal was executed.

Xetra EnLight provides sufficient information to fulfill the Best Execution requirement by providing following on-book information in the Xetra EnLight Deal:

- Top of Book – Best Bid and Ask prices at the point the deal-making order was executed.
- Volume Weighted Average Price (VWAP) – based on the quantity of the deal.



Xetra EnLight Negotiation Event Workflow

11.3 Xetra EnLight Smart RfQ Functionality

The Smart RfQ functionality in Xetra EnLight provides the possibility to send an anonymous RfQ to certain participants. Based on the requested instrument, Smart RfQ uses innovative new technologies to find a counterparty for a trade.

Directly, at the beginning of the Negotiation Event, the requester has the possibility to decide whether to use Smart RfQ. If the requester has enabled Smart RfQ via a dedicated flag in the RfQ, then apart from the explicitly selected requester, the RfQ is sent to those participants who have agreed to be part of Smart RfQ program and who are selected via an intelligent algorithm in the respective instrument.

The participation within Xetra EnLight Smart RfQ is entirely anonymous. The requester as well as the respondents get no private information of the counterparty during the negotiation. Still as similar to Xetra EnLight without Smart RfQ, the requester may select the quotes manually or opt for an algorithm, which results in anonymous quotes being part of the negotiation. The requester has to provide the quote identifier in the SRQS order if an anonymous quote is selected.

Whether Smart RfQ is available for an instrument is configurable and decided by the exchange. Participants who want to take part in the Smart RfQ program have to apply individually.

12. Trade Management

12.1 Overview

T7 is a trading system, the purpose of which is to receive orders and quotes, and to match these, thereby creating trades and – for derivatives – open positions. Finally, it forwards all created trades to the appropriate clearing system depending on the participant and product setup, respectively the instrument setup for cash markets.

T7 offers therefore no clearing functionality and only limited trade management functionality, which is described in this chapter. This includes:

- Trade Enrichment with general Clearing and Settlement related Information:
For both orders and quotes, the automatic enrichment of trade items with clearing related identification, and additionally for cash markets settlement related information, of the trading participant and of the clearing member as known to the clearing system.
- Automatic Trade Enrichment with pre-defined Clearing related Information:
For quotes and for a specific type of orders, the automatic enrichment of trade items with user provided pre-defined values for clearing related information.
- A trade reversal and trade entry facility available exclusively to the exchange.

12.2 Trade Enrichment

12.2.1 General Trade Enrichment

T7 automatically adds to each trade item the following clearing related information:

- Information about the trading participant as known to the receiving clearing system.
- Information about the clearing member as known to the receiving clearing system.
- Optionally for cash markets, information about the counterparty/CCP of the trade item, as known to the receiving clearing system.
- For cash markets, settlement related information.

The underlying assumption is that all the trades of a specific participant are cleared by the same clearing member (Exception: Post-trade Model in Cash Markets, see below).

12.2.2 Entering Clearing Related Information for Orders

On an order, it is possible to specify values for the following attributes that are not trading related and are forwarded in the trade items to the clearing system:

- Open/Close Indicator: The open/close indicator specifies whether the trade should be used to open a position or to close a position. For complex instruments, the open/close indicator is available independently for each leg of an order.
- Clearing Account: The clearing account is the position account used in the clearing system. It is also used by the Eurex clearing system to decide if a trade shall be given up to another participant or whether it shall be marked for give-up. For complex instruments, the clearing account is available independently for each leg of an order.

- Take-Up Member: The take-up member is the participant as known to the clearing system, to which a trade is given up.
- Free Format Text fields: There are printable text fields that can be freely used for various purposes.

T7 does not validate or modify the values of these attributes but forwards them unchanged to the clearing system. The clearing system then handles invalid data in an appropriate way.

12.2.3 Automatic Trade Enrichment with pre-defined Clearing Information

For quotes and for orders, which are sent with a special small message layout, clearing related information as described above cannot be provided directly on the order or quote. Instead, participants can submit trade enrichment rules that are then used by T7's trade manager to fill clearing related attributes on trade items before sending them to the clearing system.

This automatic trade enrichment is available for quotes, and it is available for orders, which are sent with the small message layout. It is not available for orders, which are sent with the normal long message layout, which contains the fields for the clearing related attributes. See the document *T7 Enhanced Trading Interface (ETI) – Manual* for details on order message layouts.

For cash markets, the automatic trade enrichment is available for Free Format Text fields.

For derivatives markets, the automatic trade enrichment is available for the following attributes:

- Open/Close Indicator
- Clearing Account
- Free Format Text fields
- Take-up Member

Participants may submit several different trade enrichment rules to the exchange, identifying them with different integer numbers. For each order or quote, the trade items of which shall be automatically enriched, the identifier of the desired trade enrichment rule needs to be supplied on the order or quote.

If no trade enrichment rule with the supplied identifier exists, or if the desired trade enrichment rule contains no value for a specific attribute, then T7 applies the default values to the Open/Close indicator: The Open/Close indicator is set to *Open*.

12.2.4 Cash Market specific Trade Enrichment

For non-CCP cash instruments, the functionalities of bilateral aggregation and settlement internalization are available for on-exchange and TES trades.

12.2.4.1 Settlement Internalization

Participants can opt for settlement internalization on Trading Capacity A and/or P per settlement account. Once a trade is generated, T7 checks whether both trade sides belong to the same business unit. If so, T7 then checks the settlement internalization settings of the settlement accounts. In case settlement internalization is selected for the settlement account of each trade side, the trade is marked for settlement internalization. If not, the checks for bilateral aggregation are performed. In case settlement internalization is applied, no delivery instructions are generated by the exchange.

12.2.4.2 Bilateral Aggregation

Participants can opt for bilateral aggregation on Trading Capacity A and/or P per settlement account. Once a trade is generated, T7 checks the participant's settlement account settings of the business units of the trade and in case bilateral aggregation is selected for the settlement account of one trade side, the trade side is marked for bilateral aggregation. In case bilateral aggregation is applied to a trade, the trade is aggregated by the clearing system. Delivery instructions are then generated for the aggregated trades.

12.2.4.3 AVD Trades

Trades created in an AVD uncrossing are referred to as AVD trades. There is no AVD trade type, but two AVD match types: Broker Internalized AVD trade, and AVD trade.

The disseminated AVD trades are explicitly identified as AVD trades in the trading interfaces. In case of a Broker Internalized AVD trade, T7 assigns a new valid value in the existing Clearing Instruction field to reflect the Broker Internalized AVD trade.

12.3 Trade Entry and Trade Reversal

In exceptional circumstances, the exchange may decide to enter a trade directly into T7 without going through the normal order book matching procedure (currently for derivatives only), or it may decide to reverse a trade that has already happened. An important use case is the reversal of mispriced trades. For TES trades in derivatives, a reversal process can be initiated by the initiator of the TES trade during TES Activity Status "On", with the exchange taking the final decision.

For pre-approved bilateral OTC Trade Uploads in the context of the German bilateral stock exchange trading, the trade reversal can be initiated by the counterparties, or, when it was entered in broker-mode, by the initiator. The reversal of the OTC Trade Upload will immediately be processed as pre-approved trade reversal.

Such events may have an effect on the trade statistics data that is published through the market data interfaces of T7. See chapter 13.3 for more information about this topic.

12.4 Post-trade Model in Cash Markets

In case an additional Central Counterparty (CCP) is available for the clearing, participants are able to choose that additional CCP to process their trades in addition to the usual default CCP. Each participant can define an optional clearing relation with clearing member (CM) and settlement institution (SI) at the additional CCP, on top of the default clearing relation at the default CCP. All trades are forwarded to this additional CCP if certain conditions are met:

1. The cash instrument is eligible for all CCPs.
2. The CM supports the instrument's settlement currency in the additional CCP-CM-SI relation.
3. All participants involved in the trade have selected the same additional CCP.

If these conditions are not met, then the trade is forwarded to the default CCP. The default CCP is common for all participants per market, whereas the additional CCP can be selected individually per

market.

Set Up Information:

The default CCPs for each cash market currently are:

- *ECAG for Xetra and Frankfurt.*
- *CCP Austria for WBAG.*

BSE (Bulgarian Stock Exchange) and MSE do not trade via a CCP.

12.5 Special Products with Trading and Clearing Notation

T7 supports special products, which require a price notation for clearing that differs from the one that is used in trading. These are currently:

- Total Return Futures
- Trade at Reference Price Futures
- Variance Futures

Variance Futures require additionally a different quantity notation for clearing.

While trading is done entirely in the trading notation, T7 converts for each trade the trade price and – only for Variance Futures – the traded quantity from the trading notation into the clearing notation for the clearing system.

A further characteristic of these products – except Variance Futures – is that the conversion is a preliminary one during the day, because some parameters are not yet known and can only be estimated during trading hours. Once the exact value of the conversion parameters is known, all trades of the day are finalized, i.e., they are converted again, this time applying the final values of the conversion parameters.

12.5.1 Conversion Procedure for Total Return Futures

A Total Return Future is a futures product that replicates the cash flow of a Total Return Swap. T7 supports Total Return Futures on equity indices. For more details on Total Return Futures, see the Appendix on Total Return Futures in the *T7 Functional Reference Part 2* and for further information the specific documentation on Total Return Futures published by Eurex.

Trading of Total Return Futures is performed with prices in trading notation being expressed as the Total Return Futures spread in basis points. For clearing, trade prices in trading notation are converted into the clearing notation, which is expressed in index points. There is no quantity conversion for Total Return Futures.

The conversion formula contains the underlying index close value of the same day, which is not known during trading hours. T7 therefore performs a preliminary conversion, normally using the index close value of the previous day. Once the underlying index close value is known, the trades are finalized by converting them again with the updated underlying index close value.

12.5.2 Conversion Procedure for Variance Futures

For Variance Futures, trading on T7 is performed in volatility σ as pricing information and in vega notional v as quantity information. The corresponding volatility-vega representation is denoted as (σ, v) trading notation. However, clearing of Variance Futures is performed in a different variance

pricing notation, with futures price P_t and futures quantity Q_t which is denoted as (P_t, Q_t) clearing notation.

Each match in a Variance Futures instrument thus generates a trade in the (σ, v) trading notation, which is converted by T7 into the (P_t, Q_t) clearing notation. Trades are communicated to the clearing system only in the (P_t, Q_t) clearing notation.

For more details on Variance Futures at Eurex, please refer to the appendix on Variance Futures in the *T7 Functional Reference Part 2* of this document and further on to the specific documentation on Variance Futures on the Eurex web site.

12.5.3 Conversion Procedure for Trade at Reference Price Futures

Trade at Reference Price (TARP) Futures allow to trade at differential prices relative to a reference point whose actual value may not yet be fixed during the trading phase but finally defined only after (or later in) the trading phase. The reference point is denoted as reference price. Differential prices in trading notation are converted to actual prices in clearing notation by adding the reference price to the differential price. The reference is set by the exchange for each business day. Additionally, a static clearing price offset is subtracted from a price in trading notation in the conversion to a price in clearing notation. The reference price and the clearing price offset constitute the conversion parameters for a TARP Future. Note that prices in trading notation and clearing notation have the same tick size.

The price conversion is defined as follows:

$$\text{Price in Clearing Notation} = \text{Price in Trading Notation} + \text{Reference Price} - \text{Clearing Price Offset}$$

Please note:

Market-on-close Futures are a specific type of trade at reference price Futures where the reference price is identical to the underlying index closing price. MOC Futures are settled on a daily basis in an associated Future (MOC reference Future) in the clearing system (transaction-based settlement). A MOC Future is traded on T7 independent of the associated MOC reference Future.

13. Market Data Publishing

T7 provides market data in several ways:

1. The Enhanced Market Data Interface (EMDI) provides price level aggregated market data without netting for high bandwidth customers. Without netting means that every single change to the market data is made visible, and every single match is reported individually. Price level aggregated market data means that EMDI delivers order book information in the form of the accumulated available quantities for price levels. The number of reported price levels is limited. For instruments with synthetic matching, this includes synthetic price and quantity information about the best available price level.

Setup:

EMDI is not available for Deutsche Börse Frankfurt.

2. The Market Data Interface (MDI) provides price level aggregated market data with netting for low bandwidth customers. Netting means that changes of the order book information are aggregated over a time interval with a product dependent duration. And the same occurs to the trade reporting, such that only snapshots of the general trade statistics are provided, but there is no reporting of every individual match. Like EMDI, also MDI delivers order book information in the form of accumulated available quantities for a limited number of price levels, including synthetic price and quantity information on the best price level where applicable.
3. The Enhanced Order Book Interface (EOBI) provides order-by-order market data without netting for high bandwidth customers. Order-by-order means that EOBI delivers order book information by reporting price and quantity data of each individual visible order. EOBI does not provide any price level aggregated data, and therefore, no information on synthetic prices. The following information is provided on the EOBI:
 - Market state information, as e.g. Product states and Instrument states.
 - Best price and quantity information.
 - Order book depth price and quantity information.
 - Price, quantity, and time priority of individual visible orders.
 - Individual trade volume reporting.
 - General trade statistics.
 - Requests for Quotes and Cross Announcements.
4. The Extended Market Data Services (EMDS) is a market data interface that provides a real time dissemination of all on- and off-book trade prices with a replay service. The replay service allows participants to recover from any data loss for on-book and off-book trades.

For further details on the market data streams, especially on which data is contained in which stream, please refer to the *T7 Functional Overview and Interfaces* document, to the *T7 Market and Reference Data Interfaces Manual*, to the *T7 Enhanced Order Book Interfaces Manual*, and to the *T7 Extended Market Data Services Manual*.

13.1 Market State Information

The public market data contains the following information related to the general state of the market:

- Product states (see chapter 3.2.2).
- Instrument states for simple instruments (see chapter 3.2.1).
- Instrument states for complex instruments (see chapter *Instrument States of Complex Instruments* in the *T7 Functional Reference Part 2*).
- On-book listing status for simple and complex instruments (see chapter 3.5).
- Fast market and market condition indicator (see chapter 3.2.6).
- TES activity status (see chapter 3.3).
- Off-book listing status for simple, complex and flexible instruments (see chapter 3.5).

13.2 Order Book Information

Published order book information gives an indication at which price an incoming order can be executed, and how much can be executed at that price. In general, public order book information is based exclusively on limit orders. Market orders on the order book may add to the available executable order volume, but this is never reflected in the published order book data, except for the potential auction price, also known as the indicative auction price.

Orders that are not available for matching are ignored. Thus, for example stop orders or trailing stop orders are ignored before they are triggered, but OCO orders are considered, because they are available for matching before triggering.

The order book information that is published in the public market data depends mainly on the instrument state and the trading model:

- During the instrument state *Continuous* in trading model *Continuous Trading with Auctions*, T7 publishes:
 1. The order book depth prices and the related accumulated quantities. Only orders of the same instrument's order book are considered here, i.e., the order book depth data contains only direct prices and quantities but no synthetic prices and quantities.
 2. The best synthetic buy and sell prices and their related synthetic quantities, but only if the best synthetic buy or sell price is equal to or better than the corresponding best direct price in the order book depth data.
 3. Price, visible quantity and time priority for each visible order.
- During the potential instrument state *Trade-at-Close* in trading model *Continuous Trading with Auctions*, T7 publishes the closing auction price and the accumulated quantity of all orders flagged for *Trade-at-Close*, which potentially match at this price.
- During auction instrument states and during auction freeze instrument states (but not in Freeze phase of *Continuous Auction with Specialist* trading model), T7 publishes:

1. Crossed Order Book (an uncrossing at this moment would lead to an auction trade)
The potential auction price is shown. Depending on the trading model, additional information can be published concerning the executable auction quantity and details about the market imbalance (side and quantity of the surplus).
2. Un-crossed Order Book (an uncrossing at this moment would not lead to an auction trade)
Depending on the order book transparency settings, the best buy and sell prices available are shown. Depending on the trading model, the accumulated quantities at the best bid and ask price are published additionally. The price information contains only direct prices but no synthetic prices.
 - During Pre-Call in *Continuous Auction* trading models, only quote data is published to market, in case of structured products listed at Deutsche Börse Frankfurt only via CEF.
 - During other instrument states, no up-to-date order book information is published by T7. However, during the product state Post-Trading, T7 publishes the best direct buy and sell prices that were available in the order book in the moment when the product entered Post-Trading.

The published best synthetic buy and sell prices and quantities, which are published for instruments with synthetic matching, take only limited synthetic matching opportunities into account. See the chapters on synthetic pricing in the *T7 Functional Reference Part 2* for details on published best prices and quantities in a synthetic context. Thus, since not all synthetic matching opportunities are taken into account, it is possible that an incoming order is executed at a better price than published. And it is possible that at the published best synthetic price, there is more synthetic quantity available for matching than indicated in the published market data.

The order book depth data shows the quantities that are available for matching at the best price level and at a limited number of further price levels. The exchange decides by product on the number of published price levels.

Order book depth data never takes synthetic matching opportunities into account. It provides therefore an undisturbed snapshot of the order book of an instrument, and it can thus be used by participants to calculate synthetic matching opportunities on their own, including such opportunities that are not taken into account in the published best prices. T7 supports synthetic matching for futures products. The related mechanisms are explained in detail in the *T7 Functional Reference Part 2*, chapter *Synthetic Matching in Continuous Trading*.

The data on visible individual orders is complete, i.e., it can be used by participants to construct an unlimited order book depth and to calculate all existing synthetic matching opportunities. The individual orders can be identified through the combination of the instrument identifier, the side and the priority time stamp. However, the owners of the individual orders remain undisclosed.

The maintenance of not visible orders, e.g. market orders, Closing-Auction-Only orders outside a closing auction or stop orders before being triggered, is not reported.

The Potential Auction Price is the auction price that would result, if an uncrossing would take place at this moment. See chapter 7.2.2 for details.

The order book information that is published during an auction instrument state or an auction freeze

instrument state, i.e., either best buy or sell prices or a potential auction price, never considers synthetic matching opportunities, simply because there is in any case no synthetic matching in the uncrossing of simple instruments.

13.3 On-book Trade Reporting

T7 publishes general trade statistics data as well as information about individual trades.

13.3.1 Trade Volume Reporting

The term Trade Volume Reporting refers to the publication of data about individual matches, which is available only in the Enhanced Market Data Interface. A single incoming order can be matched at several different prices, and at each price level, there can be several book orders or, in case of synthetic matching, even book paths involved.

Such a match event is structured into match steps, so that there is only one execution price for a single match step. And in synthetic matching, there is always only one execution price per involved instrument and match step. See chapter 7.2.1.2 for a description of match events and match steps. See in the *T7 Functional Reference Part 2*, chapter *Synthetic Matching in Continuous Trading*, on the extensions for synthetic matching of futures products.

The trade volume reporting publishes data about individual match steps.

In direct matching, i.e., not synthetic matching, the trade volume reporting consists of one data set per match step. A single trade volume reporting data set contains the following information:

- **Match Step Identifier:** The match step identifier provides a unique identification of the match step in the scope of the product. It is also reported in the private execution information that T7 sends to the owner of an executed order. It can thus be used to relate private information about the executions of own orders to the public information given in the trade volume reporting.
- **Execution Price:** The execution price is the price at which the orders were executed.
- **Execution Quantity:** The execution quantity is the executed quantity in the match step for the instrument. This quantity may be shared among several orders.
- **Aggressor Side:** The Aggressor Side indicates the side of the incoming order. Here, the term incoming order is understood in the extended sense as explained in chapter 7.1. The aggressor side is not specified in auction trades.
- **Aggressor Time Stamp:** The Aggressor Time Stamp is reported only if a real incoming order is matched in the match step. It is not reported for auction trades, and it is not reported if the incoming order is a book order, as is the case for example for a triggered stop order. The aggressor time is the time when the incoming order arrived at the exchange backend ("Matching Engine In"). This arrival time may be slightly earlier than the transaction time of the match step. The arrival time is also provided in the response to order maintenance requests, and it can therefore be used to determine the difference between the arrival time of an own order and the arrival time of the incoming order in the match step.
- **Number of Buy Orders:** The number of buy orders that were executed in the match step.

- Number of Sell Orders: The number of sell orders that were executed in the match step.
- Algorithmic Trade Indicator: The algorithmic trade indicator indicates a trade where at least one matching order was submitted by an algorithm. This flag is only used in cash markets.

The trade volume reporting reports also trades that have been entered directly by the exchange, without going through the normal order book matching procedure. They are marked accordingly.

A Trade Reversal is the deletion of a mispriced trade in T7. Trade reversals are reported in the trade volume reporting as well.

In synthetic matching, there is one additional data set per involved instrument, which carries the information about the synthetically matched trade volume. Such data set on synthetically matched volumes may carry contributions from more than one synthetic match path.

An execution price is reported only if an order of the concerned instrument was involved in the match step. Leg execution prices in a direct match between orders of a complex instrument are not reported in the trade volume reporting.

All the data sets that belong to the same match step have the same match step identifier. Data sets that report synthetically matched trade volumes can be easily identified by looking for data sets, where either the number of executed buy orders or the number of executed sell orders is zero. Generally, in all synthetic matches, only one side of an order book is matched.

See the *T7 Enhanced Order Book Interfaces Manual* and the *T7 Extended Market Data Services Manual* for examples on trade volume reporting.

13.3.2 Last Trade Price and Quantity

The trade volume reporting data as described in chapter 13.3.1 is available only in the Enhanced Market Data Interface, which provides market data without netting. The Market Data Interface, which provides netted market data, reports only the execution price and the execution quantity of the last match step before the aggregated market data is sent out.

A customer using the netted data provided by the Market Data Interface receives the following data on individual matches:

- Last Trade Price: The Last Trade Price is the latest execution price that occurred either in continuous trading or as an auction price. If an incoming order matches at various price levels, this price reports the last executed price level. An execution price becomes a last trade price only, if an order of the concerned instrument was involved in the match. Leg execution prices in a direct match between orders of a complex instrument are not reported as last trade prices of the leg instruments.
- Last Trade Quantity: The Last Trade Quantity is the quantity that was executed in the last match step at the last trade price. If an incoming order matches at various price levels, this quantity contains therefore only the executed quantity at the last price level. And in a synthetic match event, it contains only the quantity that got executed in the very last match step, even if several match steps yielded the same trade price.

Not reported are prices of trades that had been entered directly by the exchange, without going through the normal order book matching procedure.

Trade reversals are also not reported as such, but they may affect the last trade price and quantity if it was the last match that had been reversed.

13.3.3 General Trade Statistics

General trade statistics are published by all market data interfaces. They are reported both for simple instruments and for complex instruments. The statistics strictly refer to trades of the same business day and contain the following data:

- Last Auction Trade Price: The Last Auction Trade Price is reported separately for each type of auction. It is the auction price of the last auction, so far for that day, for a given auction type, where an auction trade occurred. If an auction ends without an auction price, because the order book was not crossed, the content of this data is not changed, and so it may contain the auction price of an earlier auction.
- Opening Price: The Opening Price is the first trade price of the business day, at whatever point in time it occurred.
- Closing Price: The Closing Price is the last trade price of the business day, at whatever point in time it occurred. The official closing price will be disseminated once a product enters Post-Trading (if Retail Trading Hour Extension is not scheduled for the product) or Late-Retail-Trading.
- High Price: The High Price is the highest trade price of the instrument so far on that day.
- Low Price: The Low Price is the lowest trade price of the instrument so far on that day.
- Total Traded Quantity: The Total Traded Quantity is the sum of the quantities, which have been matched in the instrument's order book trading, accumulated over the current day. Included are first of all those match quantities, where orders of the instrument were involved on at least one side. For simple instruments, the Total Traded Quantity contains additionally the leg volumes resulting from direct matching in complex instruments. AVD trades count into this statistics.
- Total Trade Count: The number of trades, accumulated over the current day. AVD trades count into this statistics.
- Last AVD Trade Time and Quantity: The time and quantity of the last trade which occurred in an AVD uncrossing.

As there is no auction phase for complex instruments, there is no last auction trade price reported for complex instruments. The auction price in an uncrossing of a complex instrument reported as a last trade price, but not as a last auction trade price.

Executed quantities of trades that had been entered directly by the exchange, without going through the normal order book matching procedure, are reflected in the total traded quantity, but not in the other statistics.

Except for the last auction trade price, T7 automatically adjusts the general trade statistics data in case of such a trade reversal.

13.4 Off-book Trade Reporting

T7 also publishes general trade information about individual off-book trades. However, bilateral TES trades which are marked as Non-disclosed are not published intraday on the market data interfaces.

Set Up Information:

The off-book trade reporting is set up for Eurex and WBAG.

13.4.1 Trade Volume Reporting

The trade volume reporting data for off-book trades, which is available on both the Enhanced Market Data Interface and the Market Data Interface, contains the following information:

- **TES Trade Identifier:** The TES trade identifier provides a unique identification of the TES trade in the scope of the product. It is also reported in the private TES trade broadcast that T7 sends to the Initiating and Approving Users involved in the TES trade. It can thus be used to relate private information about the own TES trade to the public information given in the trade volume reporting.
- **Execution Price:** The execution price is the price of the TES trade.
- **Execution Quantity:** The execution quantity is the overall quantity of the TES trade. This quantity may be shared among several TES sides.
- **Trade Time Stamp:** The trade time stamp is the time stamp when all sides of the TES trade had been approved.
- **Trade Type ID:** The table below summarizes the mapping between TES Type and Trade Type ID which is also provided by T7 to the clearing system. In case of TES trades referring to complex instruments (i.e., instruments with instrument type not identical to simple instrument) the Trade Type ID is the same for all leg trades of the complex instrument trade they belong to.

Product Line	T7 Instrument Type	T7 TES Type	Trade Type ID
OPTION	SIMPLE_INSTRUMENT	BLOCK	1
FUTURE	SIMPLE_INSTRUMENT	BLOCK	1
FUTURE	SIMPLE_INSTRUMENT	EFP-FIN	1001
FUTURE	SIMPLE_INSTRUMENT	EFP-IDX	1002
FUTURE	SIMPLE_INSTRUMENT	EFS	12
FUTURE	SIMPLE_INSTRUMENT	VOLA	1000
OPTION	FLEXIBLE_INSTRUMENT	BLOCK	54
FUTURE	FLEXIBLE_INSTRUMENT	BLOCK	54
OPTION	STANDARD_OPTION_STRATEGY	BLOCK	1
OPTION	NON_STANDARD_OPTION_STRATEGY	BLOCK	1
OPTION	OPTION_VOLATILITY_STRATEGY	BLOCK	1
OPTION	NON_STD_OPTIONS_VOLA_STRATEGY	BLOCK	1
FUTURE	FUTURES_SPREAD	BLOCK	1
FUTURE	STANDARD_FUTURES_STRATEGY	BLOCK	1
FUTURE	PACK_AND_BUNDLE	BLOCK	1
FUTURE	STRIP	BLOCK	1
FUTURE	SIMPLE_INSTRUMENT	TAM	1
FUTURE	FUTURES_SPREAD_TAM	TAM	1

13.4.2 Last Trade Price and Quantity

Last Trade Price and Last Trade Quantity of off-book trades are published on both market data interfaces:

- Last Trade Price: The Last Trade Price is the price of the latest TES trade which has been approved by all parties.
- Last Trade Quantity: The Last Trade Quantity is the quantity of the latest approved TES trade in the instrument.

13.4.3 General Trade Statistics

The general trade statistics are published by both market data interfaces. They are reported for simple, flexible and complex instruments. The statistics strictly refer to trades of the same business day and contain the following data:

- Total Traded Quantity: The Total Traded Quantity is the sum of the quantities, which have been traded off-book, independent from the TES type, accumulated over the current day. For simple instruments, the Total Traded Quantity additionally contains the leg volumes resulting from TES trades in complex instruments.
- Non-disclosed Traded Quantity: The Non-disclosed Traded Quantity is the total non-disclosed quantity and is published only after the off-book trading for the product has closed for the day.

14. Risk Protection

The T7 system offers a variety of functionalities that help participants to mitigate their risk:

14.1 Transaction Size Limits

For derivatives markets, the Transaction Size Limits functionality restricts the quantity at order, quote, or TES trade entry/modification. Individual transaction size limits are supported for the three TSL Types on-book trading, off-book trading, and Futures Calendar Spreads.

⇒ Please find a detailed explanation in the *T7 Participant and User Maintenance Manual*.

The key concepts of Transaction Size Limits for Eurex are the following: Transaction Size Limits are configurable per TSL Type and product, and on different levels: Exchange, clearing member, participant, and TSL User Groups respectively single users. Two classes of TSL can be defined (STSL, ETSL) using TSL Product Groups and TSL User Groups.

TSL Class *Standard Transaction Size Limits* (STSL) covers the vast majority of the TSL configuration, defining TSLs for a group of products (TSL Product Groups) and groups of users (TSL User Groups).

TSL Class *Exception Transaction Size Limits* (ETSL) allows trading participants to define TSLs *specifically* per user respectively TSL user group, product and TSL Type, up to an exchange-defined maximum number of exceptions to cater for individual needs. The maximum number of exceptions per Trading participant is calculated by the multiplication of the participant's number of trading users with an ETSL Multiplier defined by the exchange.

The effective TSL is selected considering the hierarchy of the TSL definitions on participant level, clearing member level, and exchange level. If e.g. an ETSL set by a trading participant is higher than any corresponding STSL value set by the exchange or by the clearing member, then the effective TSL does not exceed the STSLs defined by the exchange or by the clearing member.

TSL Product Groups are created by the exchange, grouping all products into these groups. Every product belongs only to one single TSL Product Group. It is not possible that a product belongs to no TSL Product Group or to more than one TSL Product Group. These TSL Product Groups are used by all trading participants, clearing members and by Eurex while defining the STSLs.

TSL User Groups may be created by trading participants for their own users. A user may belong to no or to one TSL User Group. TSL User Groups are not related to the already existing Trader Groups or Risk Groups for users. The user groups are limited in number and are not visible to the clearing member nor to other trading participants. If a user belongs to a TSL User Group, both STSL and ETSL can be defined for this user, otherwise only ETSL can be defined for this user. The exchange and clearing members do not use TSL User Groups for their STSL definitions.

The following table outlines the TSL configuration possibilities per stakeholder: Eurex determines the limits for the whole market, the clearing members for their clearing clients and the trading participants for their TSL User Groups respectively single users.

Stakeholder	TSL Class	Granularity
Eurex	STSL	Per TSL Product Group and TSL Type
Clearing Member	STSL	Per TSL Product Group, Clearing Client, and TSL Type
Trading Participant	STSL	Per TSL Product Group, TSL User Group, and TSL Type
Trading Participant	ETSL	Per Product, User, and TSL Type

Please note: Clearing members can define STSL for their clearing clients even when the C7 capacity assignment is not enabled. – A TSL value of 0 means that no trading is possible. If the TSL value is not set for a TSL definition, then no restrictions apply.

14.2 Pre-Trade Risk Limits

The Pre-Trade Risk Limits (PTRL) calculate in real time how much of a given limit has already been consumed by incoming transactions and executions throughout the trading day. The limit can be expressed as quantity or as notional value limit.

Depending on the application scope of Pre-Trade Risk Limits, either only on-book transactions like orders and quotes are evaluated toward the Pre-Trade Risk Limit consumption, or on-book and TES trades are evaluated (separately).

For Cash Markets, the application scope is on-book trading. For Derivatives Markets, it is on-book and TES trading.

- For order book trading and TES trading separately, if applicable
- Per product.
- For each trade direction (buy and sell, or “long” and “short” for options).
- Special attribute not applicable to all products and only applicable for Derivatives Markets:
 - A Netting Coefficient (NC) for Futures Spreads

The PTRL consumption for a trade direction (buy or sell) consists of two components, being:

- The aggregated limit of all open orders and quotes per trading direction respectively TES trades, if applicable, and
- the netted position of all the trades relative to the trading direction.

The following parties can define a PTRL definition:

- The exchange, for a Business Unit.
- Clearing Members, for business units of their related DC market participants, and for their own DC market participants trading business unit.
- Trading Business Units, for different user risk groups. Please note, that completed trades stay with the previous user risk group when the user risk group changes.

If an order, quote, or TES trade, if applicable, leads to the situation that the current PTRL consumption plus the incoming transaction’s applicable limit would be exceeding the consumption limit, then this incoming order, quote, or TES trade is rejected.

The initial setup of PTRL limits becomes effective on the next business day. Intraday changes of existing PTRL limits become effective immediately.

In case of a Market Reset, the restated orders are re-accumulated as open limits of the respective trading sides. Trade Reversals do not cause an update of the net position,

14.2.1 Pre-Trade Risk Limits expressed as Quantity Limits

For Derivatives Markets, the PTRL are expressed as quantity limits. For Options and Futures, the quantity is taken as sole PTRL. For Futures Spreads, a *Netting Coefficient* (NC) can be defined.

The NC allows trading participants to determine with how much weight Futures Spreads are considered when calculating the relevant quantity consumptions. The NC has valid values between 0 and 1 with a precision of 4 decimals. No negative values are allowed. A value of 1 means that the Futures Spread is fully counted (i.e. 100%), whereas an NC of 0 means that the Futures Spread is not counted at all (i.e. 0%). If no NC is defined but a Pre-trade Risk Limit exists, then the NC is assumed as 1. If a NC is defined but no Pre-trade Risk Limit exists, then no PTRL consumption is calculated. Futures Spreads are considered in their entirety and not decomposed into their legs like other complex instruments (for more details, see below).

The specific formulas to calculate the PTRL Consumption for Options and Futures are:

PTRL Consumption Buy

$$= (\text{Net Position Buy} + \text{Open Quantity Buy}) \text{ and only for Futures Spread:} \\ + \text{Round} (\text{NC} \times (\text{Futures Spread Net Position Buy} + \text{Futures Spread Open Buy Quantity}))$$

PTRL Consumption Sell

$$= (\text{Net Position Sell} + \text{Open Quantity Sell}) \text{ and only for Futures Spread:} \\ + \text{Round} (\text{NC} \times (\text{Futures Spread Net Position Sell} + \text{Futures Spread Open Sell Quantity}))$$

where

- Buy and Sell indicate the trade direction.
- Open Quantity includes unexecuted orders or quotes resting in the orderbook and pending (i.e., not yet approved) TES trades.
- Important: For options, quotes are not considered for the calculation.

Orders and quotes as well as trades in complex instruments are handled in accordance with their legs, with the exception of Futures Spreads (see above). The quantity of an open order or quote of a complex instrument is given by the sum of all legs multiplied with the corresponding leg ratio and accounting for trade direction. The same applies to pending off-book trades. Since trades in complex instruments are decomposed into leg trades regardless of whether traded on-book or off-book, the corresponding traded quantity for each trade direction is considered on leg instrument level.

As an exception, for TES Vola trades and for the underlying leg trade of an Options Volatility Strategy, the Pre-Trade Risk Limits functionality is not covered.

Set Up Information:

Currently switched on for Eurex. It is available for all products in TES trading and for selected futures in on-book trading. For TES type Eurex EnLight it is not available.

14.2.2 Pre-Trade Risk Limits for Options

Pre-Trade Risk Limits for Options extend the PTRL concept using quantity limits in the following way:

- Every options contract has a *PTRL Consumption* according to the previously defined quantity and according to the combination of the buy/sell indicator with the respective option delta (respective whether it is a Call or Put option). The zero delta is truncated to +/- 0.01 for simple instruments. Only for complex instruments the zero delta results in no *PTRL Consumption*.
- Important: For options, quotes are not considered for the calculation.
- For the *PTRL Consumption* calculation, a *Delta Equivalent Futures Quantities for Options* reflects the appropriate risk contribution. Each order quantity, either resting in the book or executed, is translated into a futures delta equivalent quantity by applying the T-1 theoretical delta of the instrument. The value range is [-1, 1], positive for Call options, negative for Put options. For simple and flexible instrument orders and quotes, there is a minimum delta of +/- 0.01 so that at least 1% of the quantity is consumed.
- For complex options instruments the delta equivalent futures quantities are not decomposed into their respective outright instruments for *PTRL consumption* but considered as single strategy. As a result, the complex instrument, while not executed, consumes PTRL long or short limits according to their complex instrument delta equivalent futures quantity. The overall *PTRL consumption* of a complex instrument may be zero. For all complex instruments of type Standard Options Strategy and Non-Standard Options Strategy, the delta of the Options Strategy leg can be calculated based on the respective fixed strategy layout. Specifically for Options Volatility Strategies, the underlying futures leg is counted to the options' *PTRL Consumption*.

[Set Up Information:](#)

Currently switched on for Eurex. Not available for TES type Eurex EnLight.

Switched on also for Nodal.

14.2.3 PTRL Calculation examples for Derivatives

Please find in the following calculation examples for:

- Simple Derivatives Instruments.
- Complex Instruments
- Butterfly and Condor

PTRL Calculation for a Simple Instrument

There are the following PTRL limits defined for FESX:

- Buy Limit = 150 lots
- Sell Limit = 100 lots

Each entered FESX order will be added to the PTRL buy and sell counter depending on the side of the order and checked against the PTRL limit defined for each side.

Assuming both PTRL counters, PTRL buy and sell counter, start from zero:

1. Incoming buy order with 30 lots written to the order book:
 - a. PTRL buy counter = +30 lots
 - b. PTRL sell counter = 0

2. Incoming sell order with 40 lots written to the order book:
 - a. PTRL buy counter = +30 lots (no change)
 - b. PTRL sell counter = + 40 lots
3. Incoming buy order with 80 lots is completely executed:
 - a. PTRL buy counter = +30+80 = 110 lots
 - b. PTRL sell counter = +40 – 80 = -40 lots
4. Incoming sell order with 70 lots is completely executed:
 - a. PTRL buy counter = 110 – 70 = 40 lots
 - b. PTRL sell counter = -40 + 70 = 30 lots

As compared to each PTRL limit, neither PTRL buy limit nor PTRL sell limit is breached.

PTRL Limit Calculation for a Complex Instrument

Assume a 2x1 ratio Call Spread with a signature:

- Leg 1: ODAX Jun27 12150 C, Ratio 1, Side Sell (assumed instrument delta 0.68)
- Leg 2: ODAX Jun27 12200 C, Ratio 2, Side Buy (assumed instrument delta 0.52)

The calculation of delta equivalent on instrument level is as follows:

$$Quantity_{Delta\ Equivalent,i} = BuySell_i * Quantity_{Option,i} * \Delta_{Option\ theo,i}$$

where:

<i>Quantity_{Delta Equivalent,i}</i>	The respective transformed delta equivalent futures instrument quantity for instrument i
<i>Quantity_{Option, i}</i>	The respective plain options instrument quantity for instrument i
<i>Δ_{Option theo, i}</i>	The instrument i specific theoretical options delta, is always >0 for Calls and <0 for Puts

The overall complex instrument is considered for the calculation of the delta as follows:

$$\Delta_{RBUL} = ((-1) * 1 * 0.68) + ((+1) * 2 * 0.52) = 0.36$$

This means that if 1000 lots of a 2x1 ratio Call spread are entered, this will result in an open buy quantity of 360 lots.

PTRL Calculation for a Futures Butterfly and Condor

A futures Butterfly is a 3-legged strategy, with:

- 1st leg: Buy earliest maturity with a leg ratio = 1
- 2nd leg: Sell second-later maturity with a leg ratio = 2
- 3rd leg: Buy latest maturity with a leg ratio = 1

Once the futures Butterfly is entered, either it is matched or written to the order book, its net position will be zero. Therefore, its net position will always be zero for the PTRL calculation.

A futures Condor strategy is a 4-legged strategy, with:

- 1st leg: Buy earliest maturity with a leg ratio = 1
- 2nd leg: Sell second-later maturity with a leg ratio = 1
- 3rd leg: Sell third-later maturity with a leg ratio = 1
- 4th leg: Buy latest maturity with a leg ratio = 1

Also for the futures Condor, its net position will be zero, whether matched or ritten in the order book. Therefore, its net position will always be zero for the PTRL calculation.

14.2.4 Pre-Trade Risk Limits expressed as Notional Value Limit

For Cash Markets, the PTRL are expressed as notional value limits. The notional value is defined as the quantity multiplied by the PTRL reference price. The PTRL reference price is determined at the time of the entry/modification of the order or quote and used as reference for the *PTRL Consumption* calculation of open orders/quotes. Once an execution takes place, the execution price is used to determine the *PTRL Consumption* of the executed orders/quotes and the PTRL reference price is used to reduce the open order/quote *PTRL Consumption*.

For Derivatives Markets, the concept of a notional value limit needs to consider ITM and OTM options which are currently not supported and, consequently, notional value limits are not supported for PTRL Limits in Derivatives Markets.

Order Type	PTRL reference price		
	Upon Entry	Upon Modification	Upon Order Book Restatement (Start of Day/Failover)
Buy Limit Order resp. Quote Bid	Limit Price	Limit Price	Limit Price
Sell Limit Order resp. Quote Ask	Maximum of Limit Price, LTP	Maximum of Limit Price, LTP	Maximum of Limit Price, LTP
Market Order Buy and Sell	LTP at time of order entry	LTP at time of order modification	Start of Day: Adjusted reference price from End of Day processing. Failover: The LTP before the failover.

The calculation of the *PTRL Consumption* is performed in the following way:

PTRL Consumption Buy =

$$\begin{aligned} & \text{Quantity of open orders (quotes) on Buy side} * \text{PTRL reference price} \\ & + \text{Net Position Buy} \end{aligned}$$

PTRL Consumption Sell =

$$\begin{aligned} & \text{Quantity of open orders (quotes) on Sell side} * \text{PTRL reference price} \\ & + \text{Net Position Sell} \end{aligned}$$

The Net Position (Buy/Sell) reflects the executed notional value and is reset to 0 at start of day.

For orders with trading restrictions IOC, BOC and FOK, the complete quantity is considered for the evaluation of the *PTRL Consumption* at the time of the order entry/modification. For Iceberg orders, the full quantity is considered for the evaluation of the *PTRL Consumption* at the time of the order entry/modification.

For orders with the restrictions

- Auction Only
- Intraday Auction Only
- Opening Auction
- Closing Auction

the *PTRL Consumption* is only evaluated at the time of the order entry or modification but not when the auction call phase starts.

[Set Up Information:](#)

Currently switched on for Xetra and WBAG.

14.2.5 Stopping the Trading Activity via PTRL

The PTRL limit mechanism can be used to stop the trading activity of certain traders. This can be done on two levels:

- User risk group
- Business Unit

The following steps are taken to perform a trading stop in this way:

- The PTRL limits on both sides, buy and sell, are set to zero.
- An order and quote mass deletion is performed for these traders.

Another method to stop the trading activity with the help of the PTRL limit mechanism is to set the Participant / User Risk Group Status in PTRL from “Active” to “Suspend” in PTRL requests. This can be done:

- for the entire Business Unit, by Clearing Members for their NCMs, or
- for a user risk group, by the NCM owning the user risk group.

Once the status is set to “Suspend”, all orders and quotes and open TES trades of the participant or all orders and open TES trades of the user risk group are automatically deleted. Quotes are not deleted for the user risk group since quotes do not belong to users but to sessions. Clearing Members and NCMs can set the status to “Active” again in the same way.

14.3 Overall Risk Limits

The Overall Risk Limits (ORL) constitute a specific risk protection mechanism for Sponsored Access (SpA), see chapter 2.2.5, in cash markets. SpA Providers can define ORL limits for each of their SpA User Companies. XML reports reflect the configuration and limit breaches of ORL limits.

14.3.1 ORL Gross and Net Limits

The consumption limits are defined as Gross and/or Net limits. Gross and Net in this context relate to a risk consumption calculation perspective:

- “Gross” means adding up the orders/executions values from both the buy and the sell side.
- “Net” means subtracting the sell side orders/executions values from the buy side values.

14.3.2 ORL Calculation

With each new business day, the ORL consumption is reset to 0, since the open orders from the previous business day have expired (SpA orders are restricted to GFD, IOC, FOK validities), and the executed orders from the previous day are not be in scope. Only orders in on-book trading are considered for the ORL calculation (there are no quotes in SpA trading).

The value of the ORL limits is calculated in EUR currency. Orders and executions in a currency different from EUR are converted to EUR.

The Gross ORL consumption

$$\begin{aligned}
 &= \Sigma (\text{open orders Buy: quantity} * \text{limit price}) \\
 &+ \Sigma (\text{open orders Sell: quantity} * \text{limit price}) \\
 &+ \Sigma (\text{executed orders Buy: quantity} * \text{executed price}) \\
 &+ \Sigma (\text{executed orders Sell: quantity} * \text{executed price})
 \end{aligned}$$

The Net ORL consumption

$$\begin{aligned}
 &= \Sigma (\text{open orders Buy: quantity} * \text{limit price}) \\
 &+ \Sigma (\text{executed orders Buy: quantity} * \text{executed price}) \\
 &- \Sigma (\text{open orders Sell: quantity} * \text{limit price}) \\
 &- \Sigma (\text{executed orders Sell: quantity} * \text{executed price}), \\
 &\text{taking the absolute (positive) value of the result.}
 \end{aligned}$$

The value is rounded to full integers according to the rules of commercial rounding.

14.3.3 ORL Levels

The ORL limits can be defined by three levels of increasing risk mitigating actions: If a set level is breached, the appropriate action is triggered:

- Level 1: Warning messages are sent to the SpA Provider and to the affected SpA User Company that caused the breach of the limit.
- Level 2: A session throttle of a maximum number of transactions per second (TPS) as defined by the SpA Provider is put in place for the affected SpA User Company (ORL throttle). The throttle affects only potential risk increasing transactions such as adding orders. Notification messages are sent.
In case the ORL consumption of a throttled SpA User Company gets below the Gross and Net Level 2 thresholds, either by less consumption or by increased ORL thresholds, then the throttle is removed and a notification is sent.
- Level 3: The affected SpA User Company is automatically stopped, i.e., prevented from

trading, and all its open orders are automatically deleted. The trading stop will be reverted either automatically on the next business day or manually by the SpA Provider intraday. Notification messages are then sent to the SpA Provider and to the affected SpA User Company that caused the breach of the limit.

Please note that the order which caused the breach of a level limit is accepted and potentially executed.

14.3.4 ORL Limits Setup

It is completely optional to set up any ORL limits. An ORL level definition set to empty (null) means that there is no restriction at all, setting it to zero (0) means that there is no risk allowance at all. New ORL definitions become effective immediately.

New ORL definitions become effective immediately. Please note that lowering an ORL definition below the current ORL consumption triggers an immediate recalculation of the ORL consumption in comparison to the new ORL definition and thus immediately triggers the respective level breach.

It is possible to define both Gross and Net ORL limits at the same time for the same level. It is also possible to leave any level definition empty while having the other level definitions filled. If not left empty, the defined values for each level have to follow the rule Level 1 < Level 2 < Level 3. This rule does not apply between Net and Gross, i.e., it is allowed that Gross Level 1 > Net Level 2.

14.4 Margin Based Risk Limits

Set Up Information:

Margin Based Risk Limits (MBRL) have been developed and are used by Nodal.

Margin Based Risk Limits serve as a pre-trade risk control mechanism. In Nodal's risk system, participants are able to define a notional value representing the maximum allowed value of its entire portfolio on Nodal over all trading venues, including T7.

On the basis of this value and considering the open positions and orders in the complete exchange portfolio both in T7 and beyond T7, Nodal's risk system is continually calculating throughout the trading day the remaining headroom for the participant, separately for both long and short positions, and communicates it to the T7 system and other trading venues in certain time intervals.

Should any order maintenance transaction on T7 cause these limits to be breached, such transaction will be rejected.

14.5 Clearing Member product-specific DC market participant inactivation

Clearing Members may inactivate one of their related DC market participants for a specific product for on-book and / or off-book trading. An inactivation for on-book trading results in the deletion of all orders and quotes as well as the rejection of any further entries of orders or quotes for the product. An inactivation for off-book trading results in the deletion of all pending TES trades as well as the rejection of TES trade approvals for the product. Entries of TES trades are still possible.

Once the Clearing Member resets the inactivation, the DC market participant can enter orders, quotes, and / or TES approvals again as before.

*Set Up Information:**Currently switched on for Eurex.*

14.6 Market Maker Protection

The Market Maker Protection functionality is described in detail in chapter 5.6. It allows market makers to define execution volume limits for their quotes. The system automatically deactivates their quotes if the limit is exceeded and optionally deletes them.

*Set Up Information:**Xetra, Frankfurt, BSE, MSE, and WBAG with its partner exchanges do not use the market maker protection functionality for any product.**Market Maker Protection is not supported for Inter-Product Spreads.*

14.7 Stop/Release Trading Functionality

On T7 a Stop/Release Trading functionality is available. The effect of this functionality is on a business unit level or for an individual user. When a business unit is stopped, all open orders and quotes of the affected business unit are deleted immediately. When an individual user is stopped, only open orders of the affected user are deleted immediately. Please note that quotes do not belong to an individual user but to a session. Additionally, the affected entity is not able to enter new orders and quotes. Stop or release can be performed by a trading participant or by the exchange. If participants want to stop themselves, e.g. in case of an emergency, another user has to confirm the request.

14.8 Emergency Mass Deletion

The Emergency Mass Deletion enables the market wide deletion of all orders and quotes for all products via the Trader GUI or the Admin GUI. This functionality is available for all markets and is relevant for the trading business unit only.

Deletion of orders can be performed for a specific user or for the entire business unit. The scope of orders allowed to be selected for deletion is controlled by the assigned user level. For example, a user with level *trader* can mass delete the own orders only, and a user with *supervisor* level can mass delete all orders for an entire business unit. However, the scope of quotes allowed to be selected for mass deletion does not depend on the user level.

14.9 Advanced Risk Protection

T7 supports the Eurex Clearing provided Advanced Risk Protection functionality (ARP) and, on trigger from C7, will slow down or suspend a participant. The deletion of open orders, quotes, pending TES trades and Eurex EnLight transactions of an affected participant may be triggered based on the configuration in C7. For further details see the respective Clearing functional reference documentation

This functionality is only provided for derivatives markets, namely Eurex and EEX.

14.10 Price Validation Functionalities

The Price Validation Functionalities represent a further safety guard for all trading participants. Whenever an order or a quote with a limit is entered into the system, the participant has to make use of this functionality in order to ensure a proper quality of the set limit. Additional information is given in chapter 6.

14.11 Clearing Member Stop of a Trading Participant

The Clearing Member Stop functionality allows users of a clearing member to stop one or many of their related trading participants (NCMs). A stopped participant is not able to enter orders and quotes into the system.

Set Up Information:

The Clearing Member Stop functionality is provided for cash markets only (Xetra, Frankfurt, BSE, MSE, and WBAG with its partner exchanges).

14.12 Maximum Order Value

The Maximum Order Value (MOV) defines the maximum value of an order, quote, TES LIS, or Xetra EnLight trade, that a trader is allowed to enter. It is the minimum value of the following two parameters: The participants can define maximum order values per user, while the exchange defines maximum order values per product (for derivatives) or instrument (for cash).

The value of each incoming order/quote side is compared against this limiting parameter and the order/quote is rejected in case the limit is exceeded. The Maximum Order Value check has to be performed for each order and quote.

In exceptional cases a user can authorize the limit exceeding the maximum order value defined by the participant by sending the order or quote once again without performing the Maximum Order Value check. But it is not possible to skip the maximum order value defined by the exchange. However, skipping the maximum order value set by the exchange will be possible in exceptional situations after contacting Market Operations.

For cash markets, the order/quote value is calculated as the total order quantity multiplied by the limit price for buy limit orders and as the total order quantity multiplied by the last traded price for market orders and sell limit orders.

For derivatives markets, the order/quote value is calculated in two steps. In a first step, price and quantity are multiplied, as for cash markets. In a second step, the final order/quote value is calculated from the result of step 1 multiplied with the contract value of the concerned instrument.

Please note that the MOV is stored in exchange currency, i.e., in case of orders in a foreign currency instrument or product, the respective exchange rate is taken into account.

14.13 Maximum Order Quantity

The Maximum Order Quantity (MOQ) for cash markets defines the maximum quantity of an order, quote, TES LIS, or Xetra EnLight trade, that a trader is allowed to enter. It is the minimum value of the

following two parameters: The participants can define maximum order quantities per user, while the exchange defines maximum order quantities per instrument.

The total quantity of each incoming order/quote side respectively TES LIS or Xetra EnLight trade side is compared against this limiting parameter and the order/quote is rejected in case the limit is exceeded. Additional rules apply for Iceberg orders. The Maximum Order Quantity check has to be performed for each order and quote.

In exceptional cases a user can authorize the limit exceeding the maximum order quantity defined by the participant by sending the order or quote once again without performing the Maximum Order Quantity check. But it is not possible to skip the maximum order quantity defined by the exchange. However, skipping the Maximum Order Quantity set by the exchange will be possible in exceptional situations after contacting Market Operations.

For derivatives, MOQ is implemented via the Transaction Size Limit (TSL) concept, please see section 14.1 for further details.

15. Appendix

This appendix contains detailed descriptions of the design of some special products that are supported by T7.

15.1 Locked Stock Scenarios

For trading model *Continuous Auction with Specialist*, relevant scenarios which can occur in connection with order add, modify, and delete messages on Locked Stock, as well as basic information about order execution confirmation messages created per action before, during and after Freeze, are listed below.

Please note: Order modify as used below is always affecting priority, if not otherwise stated.

Scenario 01: Enter order – Freeze – Modify – Unfreeze.

Step	Instrument State	Action		Resulting Order Execution Information message(s)	
		Actor	Activity	OrderStatus	ExecTypeReason
1	Pre-Call	Participant	Order add	New	
2	Freeze	Specialist	Freeze		
3		Participant	Order modify	PendingModify	
4	Pre-Call	(Specialist)	Unfreeze, no match	New	PendingModifyApplied

Scenario 02: Enter order – Freeze – Delete – Unfreeze.

Step	Instrument State	Action		Resulting Order Execution Information message(s)	
		Actor	Activity	OrderStatus	ExecTypeReason
1	Pre-Call	Participant	Order add	New	
2	Freeze	Specialist	Freeze		
3		Participant	Order delete	PendingDelete	
4	Pre-Call	(Specialist)	Unfreeze, no match	Cancelled	PendingDeleteApplied

Scenario 03: Enter order – Freeze – Modify – Unfreeze with Partial match.

Step	Instrument State	Action		Resulting Order Execution Information message(s)	
		Actor	Activity	OrderStatus	ExecTypeReason
1	Pre-Call	Participant	Order add	New	
2	Freeze	Specialist	Freeze		
3		Participant	Order modify	PendingModify	
4	Pre-Call	Specialist	Unfreeze with partial match	Partially filled	
4				Partially filled	PendingModifyApplied

Scenario 04: Enter order – Freeze – Modify below traded quantity – Unfreeze with Partial match.

Step	Instrument State	Action		Resulting Order Execution Information message(s)	
		Actor	Activity	OrderStatus	ExecTypeReason
1	Pre-Call	Participant	Order add	New	
2	Freeze	Specialist	Freeze		
3		Participant	Order modify: Reduce total quantity below traded quantity	PendingModify	
4	Pre-Call	Specialist	Unfreeze with partial match	Partially filled	
4				Filled	PendingModifyApplied

Scenario 05: Enter order – Freeze – Modify – Unfreeze with Full match.

Step	Instrument State	Action		Resulting Order Execution Information message(s)	
		Actor	Activity	OrderStatus	ExecTypeReason
1	Pre-Call	Participant	Order add	New	
2	Freeze	Specialist	Freeze		
3		Participant	Order modify	PendingModify	
4	Pre-Call	Specialist	Unfreeze with full match	Filled	

Scenario 06: Enter order – Freeze – Delete – Unfreeze with Partial match.

Step	Instrument State	Action		Resulting Order Execution Information message(s)	
		Actor	Activity	OrderStatus	ExecTypeReason
1	Pre-Call	Participant	Order add	New	
2	Freeze	Specialist	Freeze		
3		Participant	Order delete	PendingDelete	
4	Pre-Call	Specialist	Unfreeze with partial match	Partially filled	
4				Cancelled	PendingDeleteApplied

Scenario 07: Enter order – Freeze – Delete – Unfreeze with Full match.

Step	Instrument State	Action		Resulting Order Execution Information message(s)	
		Actor	Activity	OrderStatus	ExecTypeReason
1	Pre-Call	Participant	Order add	New	
2	Freeze	Specialist	Freeze		
3		Participant	Order delete	PendingDelete	
4	Pre-Call	Specialist	Unfreeze with full match	Filled	

Scenario 08: Freeze – Enter order – Unfreeze.

Step	Instrument State	Action		Resulting Order Execution Information message(s)	
		Actor	Activity	OrderStatus	ExecTypeReason
1	Freeze	Specialist	Freeze		
2		Participant	Order add	PendingAdd	
3	Pre-Call	(Specialist)	Unfreeze, no match	New	

Scenario 09: Freeze – Enter order – Modify – Unfreeze.

Step	Instrument State	Action		Resulting Order Execution Information message(s)	
		Actor	Activity	OrderStatus	ExecTypeReason
1	Freeze	Specialist	Freeze		
2		Participant	Order add	PendingAdd	
3		Participant	Order modify	PendingModify	
4	Pre-Call	(Specialist)	Unfreeze, no match	New	PendingAddApplied
4				New	PendingModifyApplied

Scenario 10: Freeze – Enter order – Delete – Unfreeze.

Step	Instrument State	Action		Resulting Order Execution Information message(s)	
		Actor	Activity	OrderStatus	ExecTypeReason
1	Freeze	Specialist	Freeze		
2		Participant	Order add	PendingAdd	
3		Participant	Order delete	Cancelled	
4	Pre-Call	(Specialist)	Unfreeze, no match		

Scenario 11: Freeze – Enter order – Modify – Delete – Unfreeze.

Step	Instrument State	Action		Resulting Order Execution Information message(s)	
		Actor	Activity	OrderStatus	ExecTypeReason
1	Freeze	Specialist	Freeze		
2		Participant	Order add	PendingAdd	
3		Participant	Order modify	PendingModify	
4		Participant	Order delete	Cancelled	
5	Pre-Call	(Specialist)	Unfreeze, no match		

Scenario 12: Enter order – Freeze – Modify – Delete – Unfreeze.

Step	Instrument State	Action		Resulting Order Execution Information message(s)	
		Actor	Activity	OrderStatus	ExecTypeReason
1	Pre-Call	Participant	Order add	New	
2	Freeze	Specialist	Freeze		
3		Participant	Order modify	PendingModify	
4		Participant	Order delete	PendingDelete	
5	Pre-Call	(Specialist)	Unfreeze, no match	New	PendingModifyApplied
5				Cancelled	PendingDeleteApplied

Scenario 13: Enter order – Freeze – Modify twice – Unfreeze.

Step	Instrument State	Action		Resulting Order Execution Information message(s)	
		Actor	Activity	OrderStatus	ExecTypeReason
1	Pre-Call	Participant	Order add	New	
2	Freeze	Specialist	Freeze		
3		Participant	Order modify	PendingModify	
4		Participant	Order modify	PendingModify	
5	Pre-Call	(Specialist)	Unfreeze, no match	New	PendingModifyApplied
5				New	PendingModifyApplied

Scenario 14: Enter order – Freeze – Modify below traded quantity – Modify – Unfreeze.

Step	Instrument State	Action		Resulting Order Execution Information message(s)	
		Actor	Activity	OrderStatus	ExecTypeReason
1	Pre-Call	Participant	Order add	New	
2	Freeze	Specialist	Freeze		
3		Participant	Order modify: Reduce total quantity below traded quantity	PendingModify	
4		Participant	Order modify	PendingModify	
5	Pre-Call	Specialist	Unfreeze, with partial match	Partially filled	
5				Filled	PendingModifyApplied

Scenario 15: Enter order – Freeze – Modify – Modify not affecting priority – Unfreeze with Partial match.

Step	Instrument State	Action		Resulting Order Execution Information message(s)	
		Actor	Activity	OrderStatus	ExecTypeReason
1	Pre-Call	Participant	Order add	New	
2	Freeze	Specialist	Freeze		
3		Participant	Order modify	PendingModify	
4		Participant	Order modify, not affecting priority	PendingModify	
5	Pre-Call	Specialist	Unfreeze, with partial match	Partially filled	
5				Partially filled	PendingModifyApplied
5				Partially filled	PendingModifyApplied

Scenario 16: Enter order – Freeze – Modify not affecting priority – Unfreeze with Partial match.

Step	Instrument State	Action		Resulting Order Execution Information message(s)	
		Actor	Activity	OrderStatus	ExecTypeReason
1	Pre-Call	Participant	Order add	New	
2	Freeze	Specialist	Freeze		
3		Participant	Order modify, not affecting priority	New	
4	Pre-Call	Specialist	Unfreeze, with partial match	Partially filled	

Scenario 17: Enter order – Freeze – Modify – Specialist Modify – Unfreeze with Partial match.

Step	Instrument State	Action		Resulting Order Execution Information message(s)	
		Actor	Activity	OrderStatus	ExecTypeReason
1	Pre-Call	Participant	Order add	New	
2	Freeze	Specialist	Freeze		
3		Participant	Order modify	PendingModify	
4		Specialist	Order modify	New	
5	Pre-Call	Specialist	Unfreeze, with partial match	Partially filled	PendingModifyApplied

Scenario 18: Enter order – Freeze – Delete – Specialist Modify – Unfreeze.

Step	Instrument State	Action		Resulting Order Execution Information message(s)	
		Actor	Activity	OrderStatus	ExecTypeReason
1	Pre-Call	Participant	Order add	New	
2	Freeze	Specialist	Freeze		
3		Participant	Order delete	PendingDelete	
4		Specialist	Order modify	New	
5	Pre-Call	Specialist	Unfreeze, no match	Cancelled	PendingDeleteApplied

Scenario 19: Enter order – Freeze – Modify – Specialist Delete – Unfreeze.

Step	Instrument State	Action		Resulting Order Execution Information message(s)	
		Actor	Activity	OrderStatus	ExecTypeReason
1	Pre-Call	Participant	Order add	New	
2	Freeze	Specialist	Freeze		
3		Participant	Order modify	PendingModify	
4		Specialist	Order delete	Cancelled	
5	Pre-Call	Specialist	Unfreeze, no match		

Scenario 20: Enter order – Freeze – Delete – Specialist Delete – Unfreeze.

Step	Instrument State	Action		Resulting Order Execution Information message(s)	
		Actor	Activity	OrderStatus	ExecTypeReason
1	Pre-Call	Participant	Order add	New	
2	Freeze	Specialist	Freeze		
3		Participant	Order delete	PendingDelete	
4		Specialist	Order delete	Cancelled	
5	Pre-Call	Specialist	Unfreeze, no match		

Scenario 21: Enter order – Freeze – Modify – Specialist Modify – Unfreeze with Partial match.

Step	Instrument State	Action		Resulting Order Execution Information message(s)	
		Actor	Activity	OrderStatus	ExecTypeReason
1	Pre-Call	Participant	Order add	New	
2	Freeze	Specialist	Freeze		
3		Participant	Order modify	PendingModify	
4		Specialist	Order modify	New	
5	Pre-Call	Specialist	Unfreeze, with partial match	Partially filled	
5				Partially filled	PendingModifyApplied

Scenario 22: Enter order – Freeze – Delete – Specialist Modify – Unfreeze with Partial match.

Step	Instrument State	Action		Resulting Order Execution Information message(s)	
		Actor	Activity	OrderStatus	ExecTypeReason
1	Pre-Call	Participant	Order add	New	
2	Freeze	Specialist	Freeze		
3		Participant	Order delete	PendingDelete	
4		Specialist	Order modify	New	
5	Pre-Call	Specialist	Unfreeze, with partial match	Partially filled	
5				Cancelled	PendingDeleteApplied

16. Change log

Version	Date	Changes
15.0 Version 1	August 17, 2026	• The T7 Functional Reference has been split into two parts. • 2.2.5 Sponsored Access: Now available for Xetra, too. Enhancements. • 4.17 Fill-or-Kill Orders: Clarification on existing FOK orders. • 7.6.3 Self-defined Market-Wide SMP IDs. • 8.3.1 Midpoint orders, too, trigger Midpoint execution detection. • 8.3.4 New Midpoint Order Trading Restrictions MBO and CRT. • 10.2 Eurex EnLight: Now for Flexible Instruments, too. • 14.3 Overall Risk Limits: New risk mechanism for Sponsored Access in cash markets.
15.0 Version 2	October 02, 2026	L1 Sign-Off. Modifications: • 1 and 2.3.1 Added German Stock Exchanges. • 2.2.5 Clarification of functionality and wording for Sponsored Access concerning ◦ Trading Halt functionality (Kill Switch) and ◦ EDC monitoring sessions • 7.2.2.3 Modified Setup for APWT for equities. • 7.4 Description of Midpoint Matching. • 8.3.4.2 More precise description of Midpoint trading restriction CRT. • Minor corrections and clarifications.