

Xetra Release 16.0

Release Description for ISE Xetra

30 November 2015

This document describes the new functionality and technical changes being implemented with Xetra Release 16.0 relevant for member firms of the Irish Stock Exchange (ISE).

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1 Introduction

This document provides member firms with a high-level description of the technical and functional enhancements which were implemented for ISE Xetra with the introduction of Release 16.0. The Release Description is specifically written for ISE Xetra project coordinators, system administrators and trading department personnel.

The main technical and functional enhancements being introduced to ISE Xetra with Release 16.0 are outlined below.

Technical enhancements were made to allow for the introduction of the Volume Discovery Service though this will not be made available until a later date. When introduced the new order type can be used for orders which are large-in-scale and it combines the benefits of an iceberg order with those of a midpoint order. In addition to the execution of an iceberg order in the open order book, the Volume Discovery Service offers members the possibility of executing the hidden volume of the order at the midpoint of the open order book against other orders using the Volume Discovery Service.

The Self Match Prevention ('SMP') functionality can assist members to avoid unintended crossings. A new optional field (CrossID) was introduced which enables members to prevent the execution of orders and quotes against all other orders and quotes of the same member marked with the same CrossID. By entering different values in the field, members have the flexibility to define different rules for individual traders, trader groups or sessions.

Optimisation of different Xetra functionalities as well as hardware enhancements further reduced the latency of Xetra. This applies both to the absolute latency and the variance of latency.

In addition to the above, Xetra Release 16.0 supports the operating system Windows Server 2012 and a mandatory upgrade of the Java Runtime Engine from version 1.7 to version 1.8 for Windows based installation was made. MISSEs and Workstations using the Solaris operating system continue to use Java version 1.7.

Xetra Release 16.0 is a mandatory release and is not backwards compatible.

2 Functional Enhancements

2.1 Volume Discovery Service

In order to enhance the current service offering Release 16.0 included updates which will allow for the introduction of the Volume Discovery Service in Q1 2016. This combines the execution probability of an iceberg order with that of a midpoint order for orders which are large-in-scale.

The existing iceberg order is enhanced by allowing for the possibility of the hidden portion of the order to execute against similar orders at the midpoint of the ISE Xetra open order book. The execution of the overall quantity is still possible in the open order book. The system will manage the respective quantities.

2.1.1 Minimum Execution Quantity

To avoid executions of a small quantity of shares which may not be favourable for the trader, the new instrument parameter 'Volume Discovery Minimum Execution Quantity ('MEQ')' will be introduced. This parameter ensures that executions of the hidden portion of quantities less than the equivalent large-in-scale threshold quantity (i.e. 'large-in-scale threshold'/'reference price') will not occur. Any quantities on the opposite side of the order book meeting the MEQ and not exceeding the hidden portion of the Volume Discovery Order can be executed in this manner. Every execution at the midpoint must meet the defined MEQ criteria.

Once the remaining hidden quantity of this type of order falls below the MEQ it will no longer be eligible for execution at the midpoint and will only be eligible for execution on the open order book.

The functionality can be disabled by setting the MEQ value to zero for the Volume Discovery Service.

The Volume Discovery Minimum Executable Quantity (VolDiscMinQty) is calculated on a daily basis and will be added to the instrument reference data available via Enhanced Broadcast Solution, Common Report Engine and the Xetra Member Section via the internet.

2.1.2 Parameters for Volume Discovery Orders

To use the new Volume Discovery Service customers need to enter a new optional field together with their iceberg order: the 'Second Limit'. Only if this limit is provided will an iceberg order be considered a Volume Discovery Order, i.e. for matching the hidden quantity at the midpoint.

The 'Second Limit' serves as a boundary up to which an execution at midpoint is possible and is not considered for the price determination at all. Consequently the 'Second Limit' needs to be higher (lower) than the 'Limit' of a Volume Discovery Order on the buy (sell) side.

The 'Second Limit' can be entered via J-Trader in the field '2nd limit', using the new field 'ordrVolDiscPrc' in VALUES, by entering the 'orderVolumeDiscPrice' in the Enhanced Transaction Solution Interface or in the FIX Gateway by entering the limit in the 'DiscretionOffsetValue' and setting 'DiscretionInst' as well as 'DiscretionLimitType' to '0'.

In conjunction with the 'Second Limit', members must ensure that the hidden quantity of the order, i.e. overall quantity of the iceberg order minus the peak quantity, is at least the size of the MEQ defined for the instrument if they want to enter a Volume Discovery Order.

All other fields need to be considered as if they are currently for an iceberg order:

- Order Type is set to 'I' (MaxFloor > 0 in FIX Gateway)

- The overall quantity of the iceberg order must be equal to or greater than the minimum iceberg quantity defined for the instrument
- The peak quantity of the iceberg order must be equal to or greater than the minimum peak quantity defined for the instrument
- The peak quantity must be at least 5 percent of the overall quantity of the iceberg order
- Iceberg orders cannot be entered as market orders; they must have a price limit
- The validity can be 'Good-for-Day', 'Good-till-Date' or 'Good-till-Cancelled'
- No trading restrictions are supported

Additionally a new execution restriction 'Good-till-Crossing/Auction' ('GTX') for Volume Discovery Orders will be introduced which allows the trader to opt for a deletion of the order at the start of the auction or volatility interruption. This is to avoid the possibility of the overall quantity being shown to the market. If GTX is not used the Volume Discovery Order participates with its full size in the auction or volatility interruption and is considered according to its normal limit.

The new execution restriction may only be used with the validity 'Good-for-Day'. It can be entered via J-Trader or VALUES by setting the execution restriction to GTX, and via the Enhanced Transaction Solution interface or FIX Gateway using 'TimeInForceCode' = '5'.

All parameters (including the execution restriction GTX) of an existing Volume Discovery Order can generally be changed and are subject to the same validations as upon entry. Additionally the following needs to be considered with respect to the price-time-priority of the order –

- The 'Second Limit' can be deleted and the Volume Discovery Order will become an iceberg order. This is possible without a change in the matching priority of the order but the execution restriction GTX needs to be deleted if it was previously set for the Volume Discovery Order
- Modifying either peak or overall quantity in a way that the hidden quantity falls below the MEQ will only be possible if the trader deletes the 'Second Limit' and, if applicable, the execution restriction GTX
- Increasing the peak or the (remaining) overall quantity will lead to a new priority. Reducing peak or (remaining) overall quantity will not cause a priority change
- Modifying a Volume Discovery Order which has a remaining hidden quantity below the MEQ in a way that results in the new hidden quantity increasing to exceed the MEQ will be handled as entry of a new Volume Discovery Order and will lead to a new priority
- Changing the visible limit will lead to a new priority while changing the 'Second Limit' will not
- An existing iceberg order cannot be modified to become a Volume Discovery Order by entering the 'Second Limit'
- Extending the validity will cause a new priority, while reducing the validity will not
- Changes to text, member internal order number or the account type are possible without affecting the matching priority

In RPTTC540 the 'Second Limit' as well as the new execution restriction GTX will be reflected accordingly. RPTTC550 will show the 'Second Limit' for Volume Discovery Orders still valid on the next trading day.

2.1.3 Matching of Volume Discovery Orders

The purpose of the Volume Discovery Order is the concurrent and competing execution possibility of the respective quantities either in the visible part of the central order book or at the midpoint. In case simultaneous execution is possible the priority algorithm is outlined below.

2.1.3.1 Matching of Volume Discovery Orders

If matching of a Volume Discovery Order would be possible in the central limit order book as well as at the midpoint, the central limit order book always has priority. Hence, incoming Volume Discovery Orders are first checked for (partial) execution in the central order book following the same logic as iceberg orders. As soon as every transaction regarding the Volume Discovery Order (or triggered by the Volume Discovery Order) in the visible book is processed, the (remaining) peak is written to the book. After that, as a last step, the execution at the midpoint is evaluated (see Example 1 in 2.1.3.3).

As with the current iceberg order, the Volume Discovery Order will be available with its full size for matching in the central order book while only the peak is shown to the market. As soon as a peak is fully executed it is replenished and the hidden quantity is adapted.

Executions at the midpoint do not have any effect on the (remaining) peak already shown to the market but the hidden quantity will be reduced accordingly.

A Volume Discovery Order will take part in the volatility interruption or auction with its full size. If the order was entered with the execution restriction GTX, it will be deleted automatically by the system at the start of an auction or a volatility interruption in continuous trading.

2.1.3.2 Matching Volume Discovery Orders at the Midpoint

Matching hidden parts of Volume Discovery Orders at the midpoint is generally possible during the continuous trading phase when best bid/ask are available in the central limit order book and a midpoint can be calculated.

Only the hidden part of a Volume Discovery Order can match at the midpoint. For example, for a newly entered Volume Discovery Order with overall quantity of 1,000,000 and a peak quantity of 200,000 a maximum of 800,000 shares could be executable at the midpoint.

Buy (Sell) Volume Discovery Orders are treated as executable if their hidden quantity is equal to or above the MEQ and the 'Second Limit' is higher (lower) than or equal to the midpoint derived from the best bid/ask in the central limit book. Execution possibilities will be checked upon entry or modification of a Volume Discovery Order (but after a potential matching in the visible book) and as soon as the midpoint in the central order book changes.

Volume Discovery Orders that are executable with regards to their 'Second Limit' are sorted according to their price-time-priority in the visible book for each side of the book separately. If matching is possible, there is one buy order with the highest price-time-priority and one sell order with the highest price-time-priority. The execution process is started by determining which of these two orders has the larger hidden quantity. This order is assumed to be 'incoming' and is matching the orders on the opposite side of the book according to their price-time-priority taking the MEQ into account.

After a match at the midpoint only the hidden quantity of the respective order is adapted accordingly. There is no effect on the visible peak in the central order book.

As soon as the remaining hidden quantity of an order falls below the MEQ, the respective order is no longer considered for the Volume Discovery Service.

If the price of the midpoint match determined in the central order book would trigger a volatility interruption, no match is executed and no volatility interruption is triggered. However, as soon as the last trade price or the last auction price is changed, the execution possibility of Volume Discovery Orders is evaluated again.

Prices and quantities of matches at the midpoint will be published to the market as an update to the Last Midpoint Price, Last Midpoint Quantity and Last Midpoint Time. The midpoint order book is supported in parallel to midpoint matching of Volume Discovery Orders both will update the same data fields.

Volume Discovery Orders will not match with orders in the Midpoint book.

2.1.3.3 Matching Examples

The examples below outline the two primary scenarios which should be considered regarding the Volume Discovery Service: the priority of matching in the central limit order book and the matching of Volume Discovery Orders at the midpoint.

Example 1: Priority of matching in the visible part of the Central Limit Order Book

MEQ = 30,000; Midpoint = 24.0; Not triggered Buy Stop Order 15,000 @ M with Stop Limit = 23.0

Visible (Hidden) Buy Qty	2 nd	Limit	2 nd	Visible (Hidden) Sell Qty
		25.0		5,000
		24.0		
50,000		23.0		
10,000 (30,000) V01	25.0	22.0		
20,000 (60,000) V02	24.0	21.0		

An incoming Sell Volume Discovery Order V03 (Total Quantity = 100,000; Peak = 10,000; Limit = 23.0; 2nd Limit = 22.6) is checked for execution possibilities in the central order book first. Here it can be executed against 50,000 @ 23.0 on the buy side. The price of 23.0 triggers the Stop Order which is inserted into the order book and immediately matches with another of the Volume Discovery Order which leaves 5,000 @ 23.0 of the peak of the Volume Discovery Order to be written to the book –

Visible (Hidden) Buy Qty	2 nd	Limit	2 nd	Visible (Hidden) Sell Qty
		25.0		5,000
		24.0		
		23.0	22.6	V03 (30,000) 5,000
10,000 (30,000)	25.0	22.0		

V01				
20,000 (60,000) V02	24.0	21.0		

The new midpoint is calculated as 22.5 and no matching at the midpoint is possible as the second limit of the sell Volume Discovery Order is higher than the midpoint in the central order book.

Example 2: Matching of Volume Discovery Orders after change of midpoint

MEQ = 30,000; Midpoint = 24.0 :

Visible (Hidden) Buy Qty	2 nd	Limit	2 nd	Visible (Hidden) Sell Qty
		27.0		5,000
		26.0	22.8 22.7	V04 (100,000) 20,000 V05 (70,000) 10,000
		25.0	23.0	V03 (160,000) 10,000
		24.0		
90,000 (90,000) V01	23.5	23.0		
15,000		22.0		
20,000 (80,000) V02	23.7	21.0		
30,000 (90,000) V06	23.5	20.0		

In the current order book situation none of the Volume Discovery Orders can be executed. An incoming sell limit order with quantity = 10,000 and limit = 24.0 is entered on to the order book.

Visible (Hidden) Buy Qty	2 nd	Limit	2 nd	Visible (Hidden) Sell Qty
		27.0		5,000
		26.0	22.8 22.7	V04 (110,000) 20,000 V05 (70,000) 10,000
		25.0	23.0	V03 (160,000) 10,000

		24.0		10,000
90,000 (90,000) V01	23.5	23.0		
15,000		22.0		
20,000 (80,000) V02	23.7	21.0		
30,000 (90,000) V06	23.5	20.0		

A new midpoint of 23.5 is determined and matching at the midpoint is started.

Following the rule described above, the orders are sorted according to their price-time-priority on both sides of the book. Matching starts with identifying the Volume Discovery Order with price-time-priority on the bid side and the Volume Discovery Order with price-time-priority on the ask side. Out of these two orders, the one with the biggest hidden quantity is identified.

On the buy side V01 has priority and on the sell side it is V03. While V01 has the biggest overall quantity, V03 has the larger hidden quantity and hence midpoint matching is started with V03.

The hidden quantity of V03 can be fully executed against 90,000 of V01 and 70,000 of V02. The remaining hidden quantity (10,000) of V02 is below the MEQ and is ignored for further matching at the midpoint.

Again the order with the highest price-time-priority and the biggest hidden quantity needs to be identified, i.e. V04. This order will then be executed against 90,000 of V06. The remaining 20,000 of V04 is again not relevant for further matching at the midpoint since it is below the MEQ.

V05 is not executed at all and is the only Volume Discovery Order that is still available for matching at the midpoint. The order book will be:

Visible (Hidden) Buy Qty	2 nd	Limit	2 nd	Visible (Hidden) Sell Qty
		27.0		5,000
		26.0	22.8	V04 (20,000) 20,000
			22.7	V05 (70,000) 10,000
		25.0	23.0	V03 (0) 10,000
		24.0		100
90,000 (0) V01	23.5	23.0		
15,000		22.0		
20,000 (10,000) V02	23.7	21.0		

30,000 (0) V06	23.5	20.0		
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2.1.4 Post Trade Processing

Trades resulting from Volume Discovery Orders can occur with two different trade types depending on which order book they are executed in. Executions in the central limit order book are booked and reported with the trade type 'XP' while trades resulting from matching at the midpoint will have the trade type 'XM'.

In CCP eligible instruments executions of an order can be aggregated under a single trade number by using order level netting. As trades out of a single order can be of different trade types for Volume Discovery Orders, the aggregation must be done separately per trade type. Therefore executions at the midpoint will be aggregated using one trade number while those executions from the central limit order book are accumulated with a different trade number. Trade modifications (e.g. change of trading account) carried out for the aggregated position of one trade type will not be transferred automatically to the other accumulated trade.

2.2 Self Match Prevention

With Release 16.0, members can now avoid executing orders and quotes against its own orders and quotes on the other side of the book via the new 'Self Match Prevention (SMP)' functionality.

2.2.1 Overview

For the Self Match Prevention functionality a new optional field 'CrossID' was added to all order and quote transactions except for deletions where Self Match Prevention is not relevant.

The CrossID is a numeric value (4-bytes) which can be implemented by members via the J-Trader using the CrossID field or via VALUES API, the Enhanced Transaction Solution interface or FIX Gateway by sending the 'MatchInstCrossID' with the respective value.

During continuous trading the system checks if orders/quotes which are executable against each other were entered by the same member with the same CrossID value. If this is the case the SMP process is triggered.

Orders/quotes which became executable against each other during a volatility interruption or scheduled auction will not be checked for the SMP criteria.

The entry of a CrossID is not supported for midpoint orders, iceberg orders, volume discovery orders, hidden orders or orders with the fill-or-kill execution restriction.

If a book-or-cancel, TOP or TOP+ order is entered and immediately cancelled as it was executable against a visible order or quote, this will not trigger the SMP process even if the incoming order and the resting order have the same CrossID and member ID.

Designated Sponsor (Market Maker) quotes can also be entered with a CrossID. Only one CrossID can be submitted when entering quotes via the Mass Quote service.

Per default, the SMP functionality is enabled for all members. If members choose to disable this functionality, any order or quote which it attempts to enter with a value included for the CrossID field will be rejected.

By entering different values in the CrossID field, members have the ability to set different rules for individual traders, trader groups or sessions.

The enablement of the SMP functionality for an instrument will be reflected in the instrument reference data available via the Enhanced Broadcast Solution interface, Common Report Engine or Xetra Member Section.

2.2.2 SMP Process

If an incoming order or quote is entered with a CrossID value (incoming SMP order) and is immediately executable it will be determined if a matching order or quote exists on the opposite side of the order book (sitting SMP order).

The incoming SMP order will be allowed to match until it hits a sitting SMP order (i.e. it can match partially against sitting orders in the book with a higher priority than the sitting SMP order). The incoming SMP order can execute against sitting orders of the same member provided they do not contain the same CrossID.

As soon as the incoming SMP order is executable against a sitting SMP order at a certain price level, the matching process will halt and the following procedure will commence:

- If the incoming SMP order's (remaining) quantity is equal to the quantity of the first sitting SMP order it hits, the incoming order is cancelled and the sitting order will also be deleted
- If the incoming SMP order's (remaining) quantity is smaller than the quantity of the first sitting SMP order it hits, then the incoming SMP order will be cancelled. The quantity of the sitting SMP order will be reduced by the incoming order's quantity
- If the incoming order's quantity relevant for the price level is greater than the quantity of the first sitting SMP order it hits, the incoming order's (remaining) quantity following any partial executions against other orders will be reduced by the sitting order's quantity and the sitting order will be deleted. The incoming SMP order's remaining quantity will match against other executable sitting orders until there are no further executable orders at this price level or until it is fully executed or until it hits another sitting SMP order at this price level. In the latter case the described steps will be repeated. In case there is still quantity remaining from the incoming SMP order after matching at the respective price level has completed, it will not match at further price levels and will be deleted

The trader is informed about the deletion or quantity reduction of his order or quote accordingly. Via the Enhanced Transaction Solution interface the new transaction reason 'SMP – Self Match Prevention' is introduced in the order status notification (trnReasonCode). In FIX Gateway this will be reflected in the new tag 'Crossed' (1 = Cross_Rejected) of the execution report.

The deleted quantity out of the triggered Self Match Prevention is reported to the market together with the respective limit via the Enhanced Broadcast Solution interface.

2.2.3 Example

Given an open order book as follows:

Buy	Qty	(Mbr/CrossID)	Limit	(Mbr/CrossID)	Qty	Sell
			51.0	(XYZDB/5566)	100	S2
			50.0		50	S1

B1	50		49.0			
B2	20	(XYZDB/9987)	48.0			
B3	500					
B4	10	(ABCDB/1234)	47.0			
B5	50	(ABCDB/9987)				
B6	5					
B7	10		46.0			
B8	40	(ABCDB/9987)				

A sell order S3 with quantity 650 and limit 46 from member ABCDB with CrossID '9987' is entered into the order book.

S3 matched according to price-time-priority initially with B1 (50 @ 49), then with B2 (20 @ 48) which has the same CrossID but was entered by a different member. It next executes with B3 (500 @ 48).

After B4, which was entered by the same member but given a different CrossID, is matched (10 @ 47), a quantity of 70 shares remains from S3.

The remaining quantity of the incoming SMP order now hits the sitting SMP order B5 which meets the criteria of the SMP process. As the (remaining) quantity of the incoming SMP order is larger, the sitting SMP order is deleted and the quantity of the incoming order is reduced to 20.

S3 is now checked for executions on the same price level where the SMP process was triggered and B6 (5 @ 47) is executed. The remaining quantity of S3 (15 @ 46) is deleted as no further matching at this same price level is possible.

The sitting buy orders B7 and B8 remain unchanged –

Buy	Qty	(Mbr/CrossID)	Limit	(Mbr/CrossID)	Qty	Sell
			51.0	(XYZDB/5566)	100	S2
			50.0		50	S1
			49.0			
			48.0			
			47.0			
B7	10		46.0			
B8	40	(ABCDB/9987)				

3 Additional Xetra Interface Changes

In addition to the functional changes to ISE Xetra as described above, there were some technical changes and interface extensions with Xetra Release 16.0.

3.1 Enhanced Transaction Solution Interface

No changes aside from the functional changes described above in Section 2 were introduced with Release 16.0. More details on all the enhancements to the Enhanced Transaction Solution interface can be found in the 'Enhanced Transaction Solution – Interface Specification Modification Announcement'.

3.2 FIX Gateway

The major technical changes and enhancements to the Xetra FIX Gateway are briefly described below. Additional details are provided in the 'Xetra FIX Gateway – FIX 4.2 and 4.4 Modification Announcement'.

3.2.1 TransBkdTime introduction in OTC Broadcast

With Release 16.0 the tag 'TransBkdTime' was introduced into the OTC Broadcast. The field indicates the date and time the OTC trade was made as specified by the customer.

3.2.2 New Version of FIXimate

A new version of FIXimate was delivered with Release 16.0. The new version contains the changes for the new release and a new graphical user interface.

3.3 Enhanced Broadcast Solution Interface

The most important change to the Enhanced Broadcast Solution interface is described in this section. Other minor changes and additional information on all the enhancements to EnBS were made available in the 'Enhanced Broadcast Solution – Interface Specification Modification Announcement' document.

3.3.1 Packet header

Value of the template ID (TID) will be changed to '34'.

3.4 Xetra Market Data Interface

No changes aside from the functional changes described above in Section 2 were introduced with Release 16.0. The final version of the 'Xetra Market Data Interface' document from Release 15.0 will therefore remain valid for Release 16.0.

3.5 Common Report Engine

With Release 16.0 no changes to the report transfers to the Common Report Engine are planned.

4 Technical Implications

A mandatory upgrade of the Java Runtime Engine from version 1.7 to version 1.8 was made for all Windows operating systems. For Solaris the Java version 1.7 remains valid with the release.

With Release 16.0 the Xetra system supports Windows 2012 Server SP 2 for MISS installations.